



THE APPLICATION OF INFORMATION TECHNOLOGY IN CUSTOMER  
MANAGEMENT FOR PROFIT-LEVERAGING ACCOUNTABILITY IN RETAIL  
AND MANUFACTURING SECTORS THROUGH SUPPLY CHAIN  
SYNCHRONIZATION

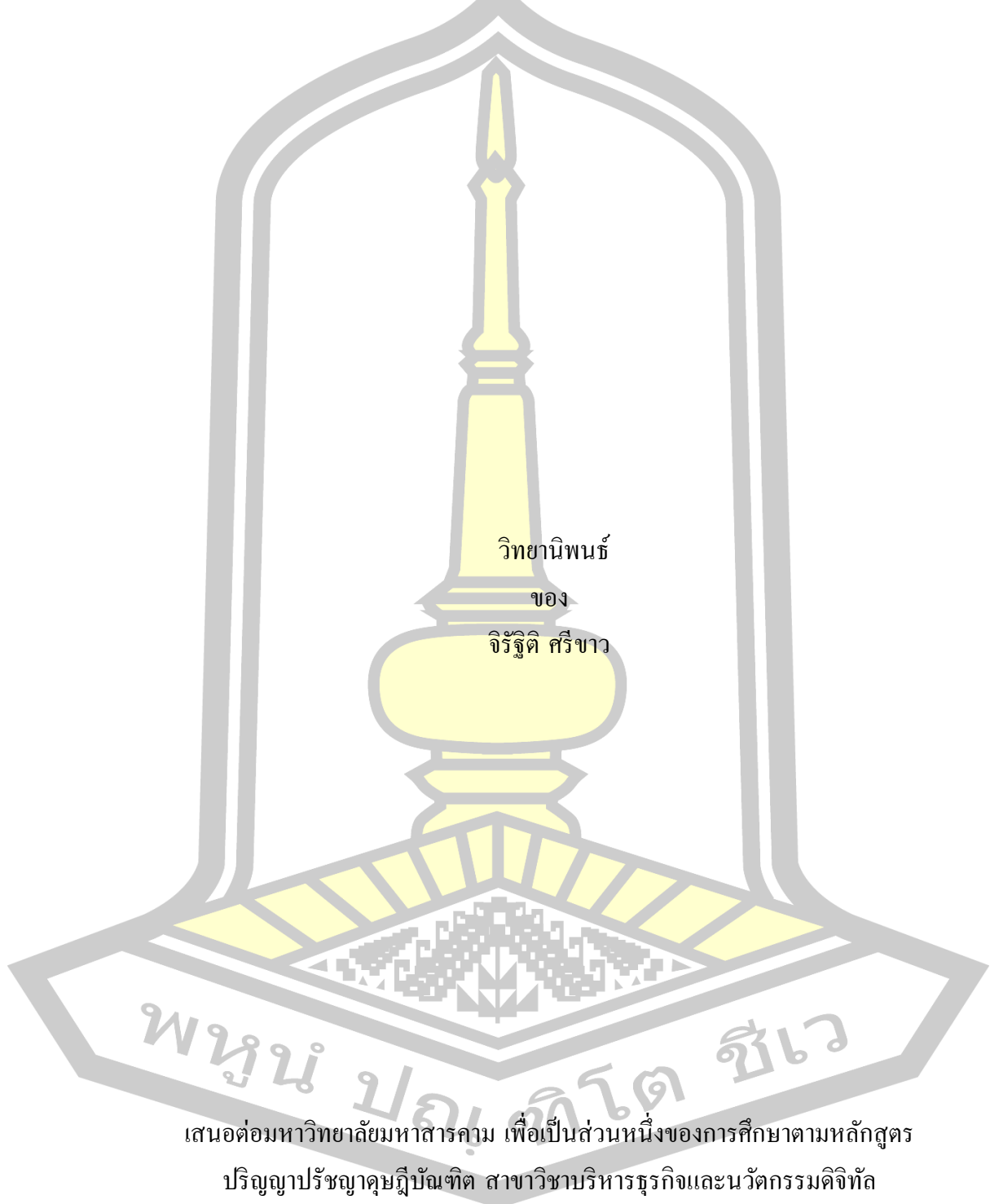
Jirathi Srikhao

A Thesis Submitted in Partial Fulfillment of Requirements for  
degree of Doctor of Philosophy in Business Administration and Digital Innovation

June 2024

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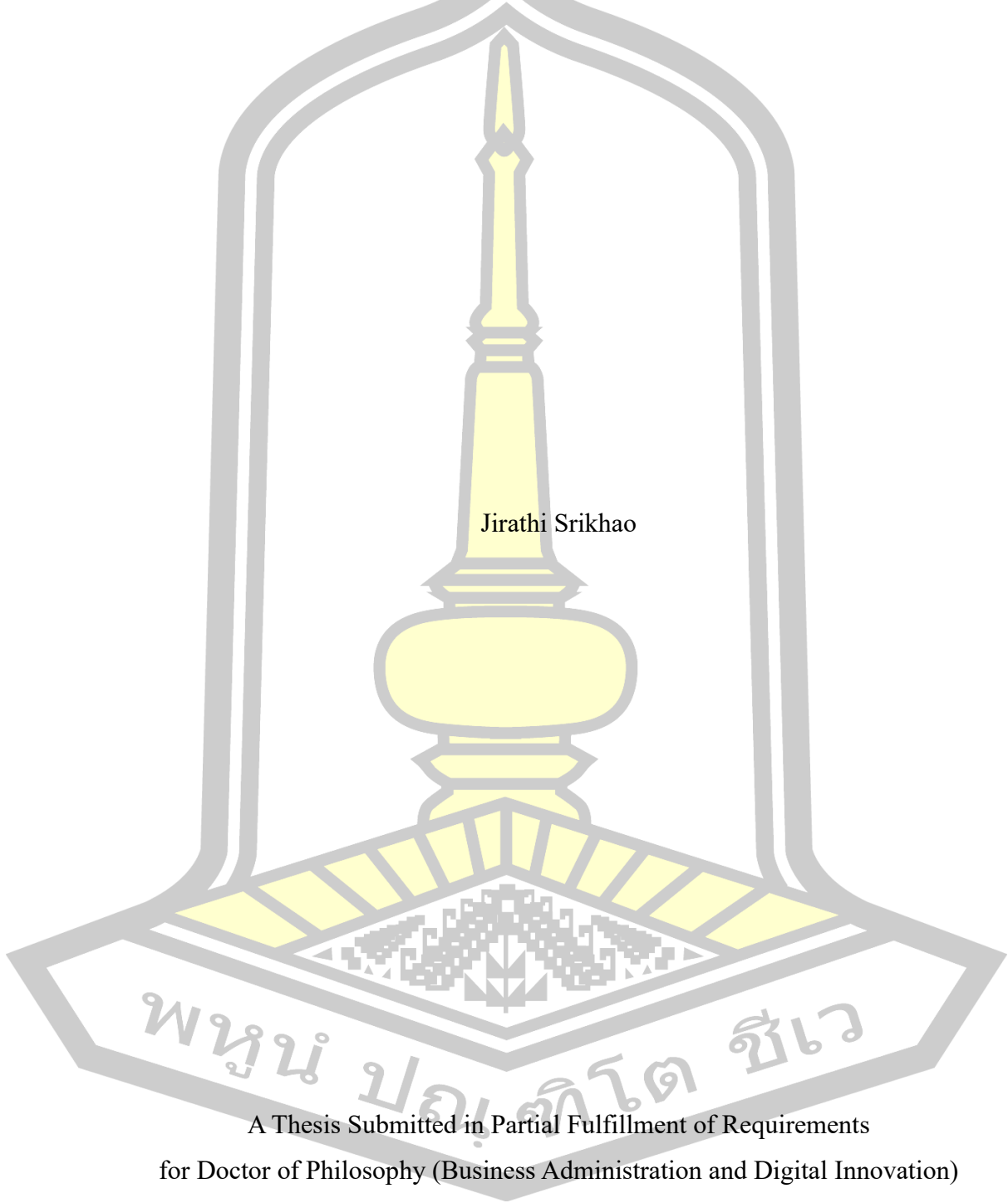
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Jirathi Srikhao



A Thesis Submitted in Partial Fulfillment of Requirements  
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<b>TITLE</b>	THE APPLICATION OF INFORMATION TECHNOLOGY IN CUSTOMER MANAGEMENT FOR PROFIT-LEVERAGING ACCOUNTABILITY IN RETAIL AND MANUFACTURING SECTORS THROUGH SUPPLY CHAIN SYNCHRONIZATION		
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### ABSTRACT

This research studies the outcome of using a consumer adherence's information technology management platform to improve the efficiency of retailer and manufacturer business operations, to increase the profit gain in the end. The author seeks to analyze retailers' business processes and efficiencies, to improve management efficiency both in retailing and manufacturing. Information inputs were stored in a retrievable database and analyzed by statistics analyzing software.

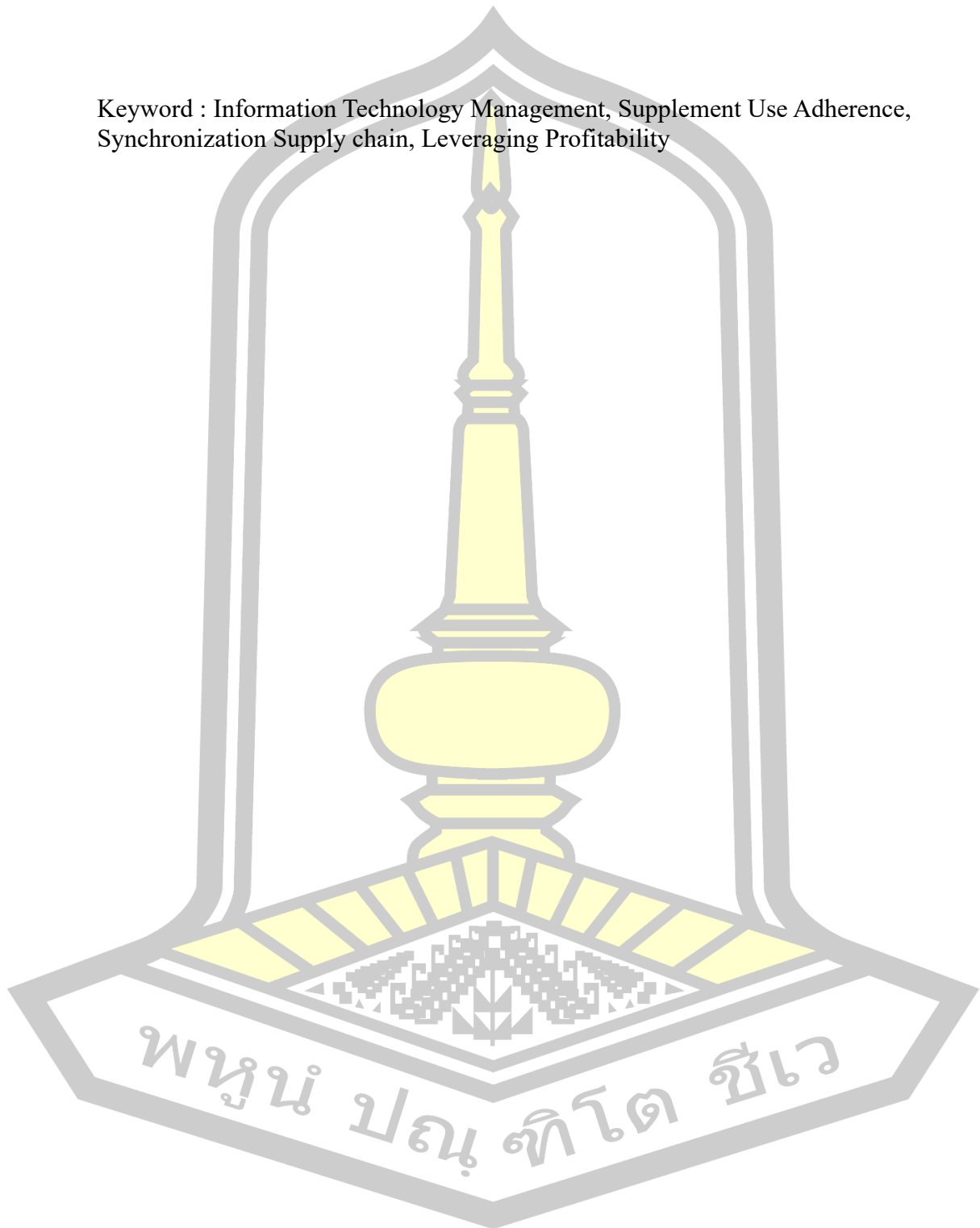
Tools for gathering information for retail consumer supplement use adherence were created, and functionally operated on a website. Retailers' consumers' information was collected and data were synchronized with the retailer's system to suggest increase in efficiency by the web tool product. Businesses' analysis of some operations was evaluated using common statistics for business tasks. Sets of questionnaires were given to retailers and to manufacturers to evaluate their efficiency in performing each evaluated task. Efficiencies of retailers' and manufacturers' management operations were statistically evaluated for task efficacy. Hypotheses were tested to determine if overall efficacy led to leveraging profit gains within each quarter of operation, within a 6 months period.

In conclusion, research finds that synchronization has helped retailers and manufacturers to manage their daily work, make a correct marketing plan, and forecast a supply chain that can take on tomorrow's market challenges.

Data suggests a good outcome for customers, retailers, and manufacturers, and that synchronization can help make consumers' daily lives more convenient. Retailers' and manufacturer' daily work was optimized, their plannings easier to forecast, and their supply chain more efficient, with better logistics seen. Further research findings can be suggested: That with web tracking, a better interactive platform in terms of a social media-like system can be derived, and in the future can be made into a digital patronage that can interact more with customers and bring more

data to retailers and manufacturers that can help them make plans more clearly.

Keyword : Information Technology Management, Supplement Use Adherence, Synchronization Supply chain, Leveraging Profitability

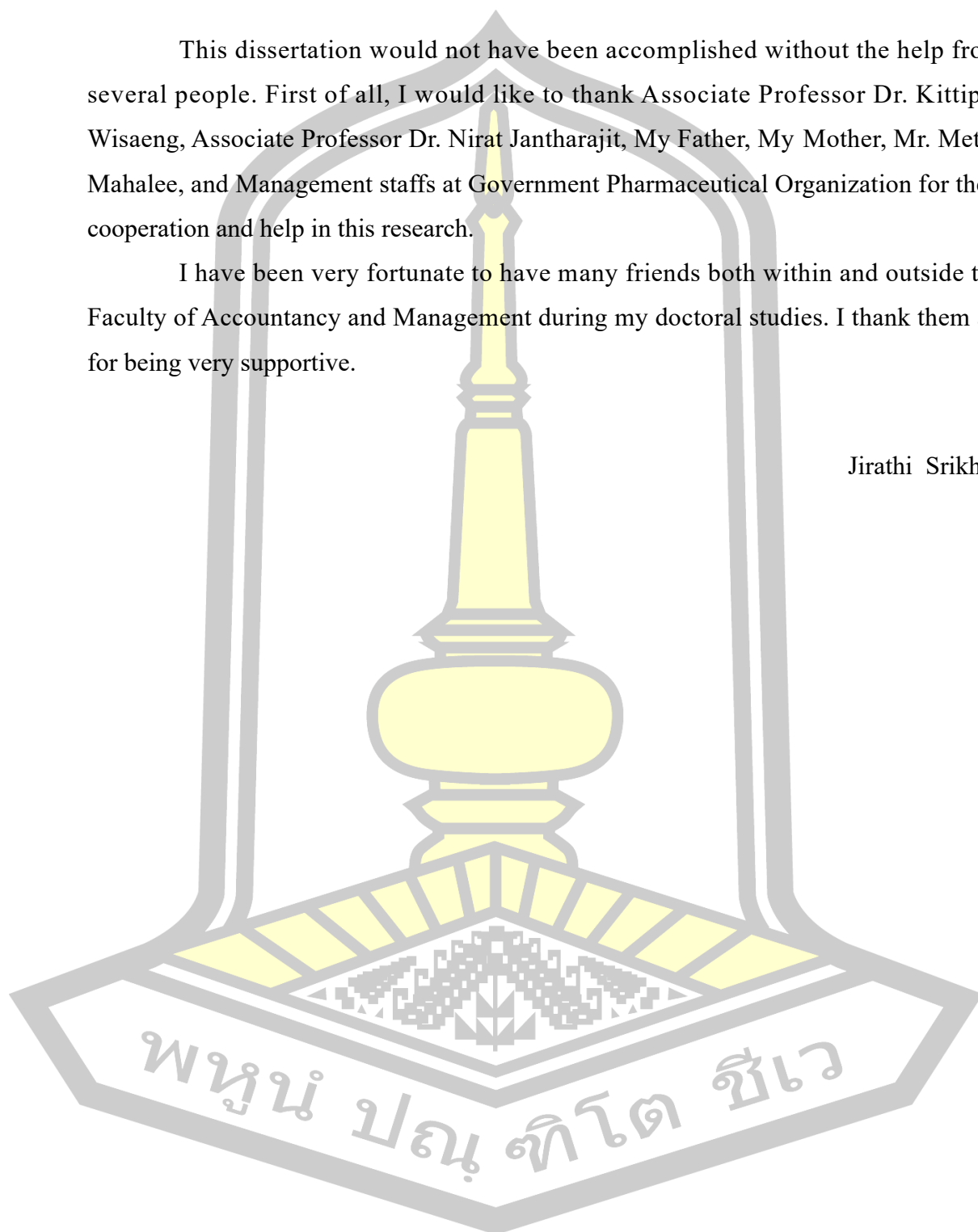


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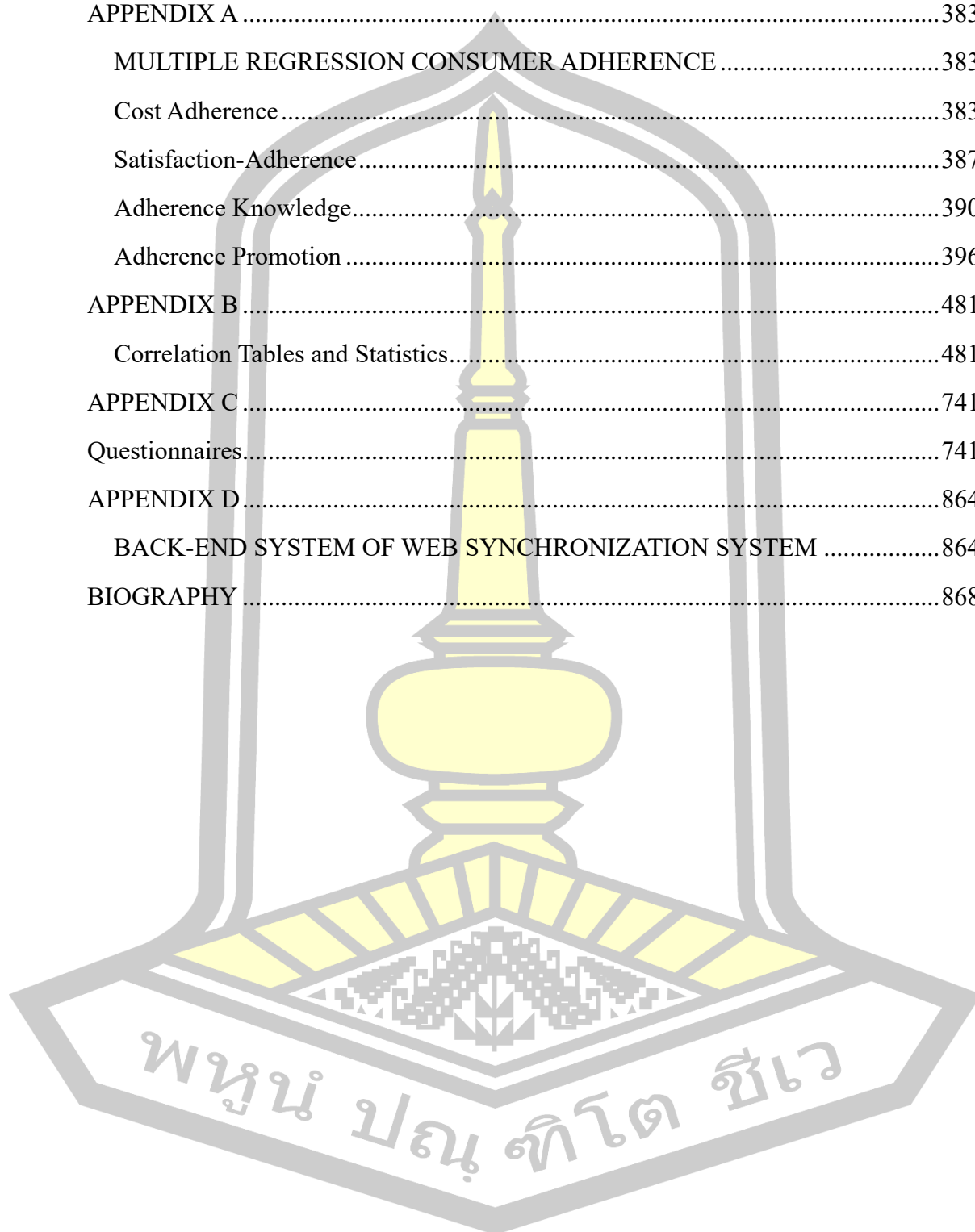
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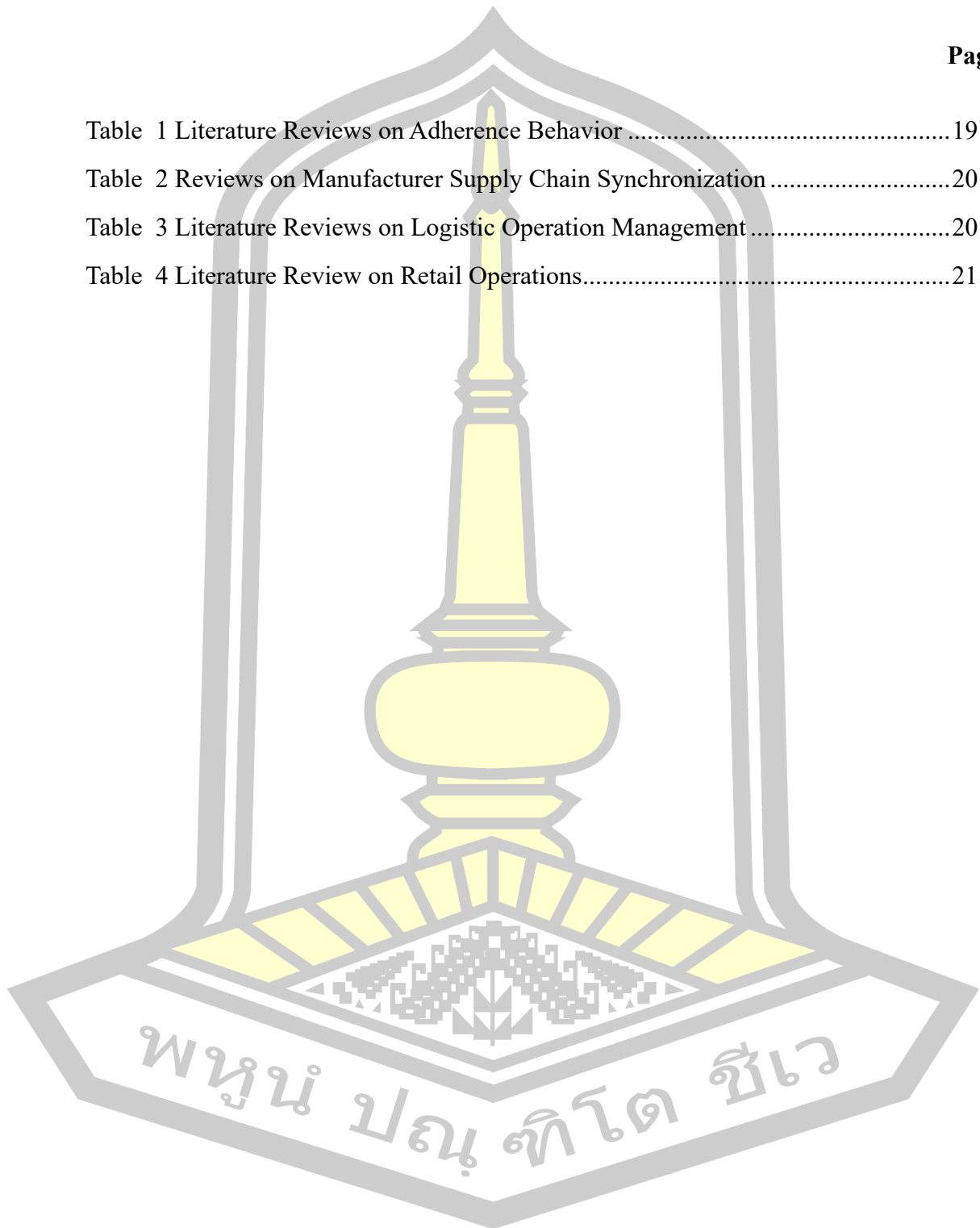
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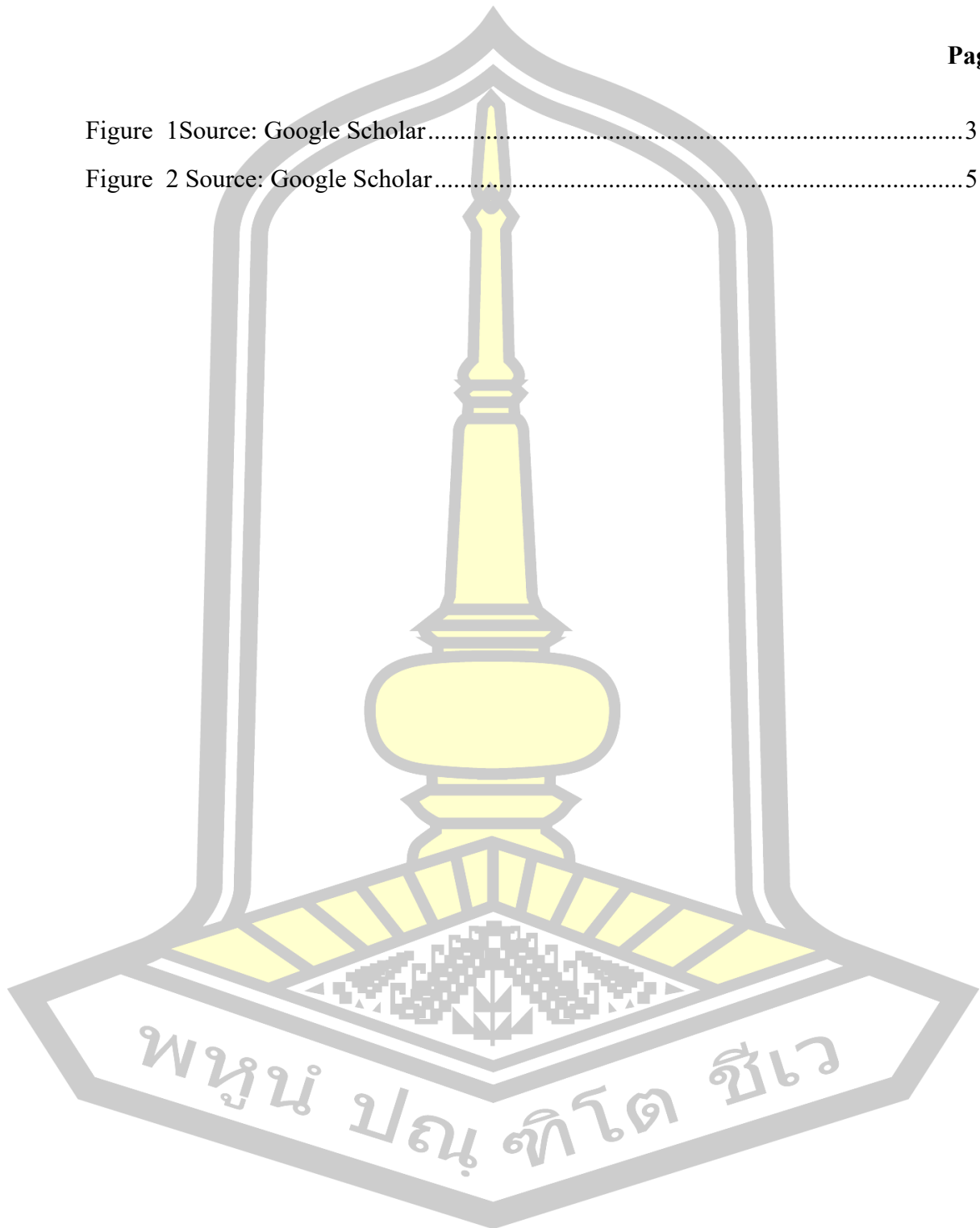
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# CHAPTER I

## INTRODUCTION

### Background

Synchronization has been a theory and in practice for a long time, since its beginning in the 1950s, that stemmed from logistic practices in the United States of America. Some countries in Europe have been practicing the concept also. The practice can be examined from many points of view. For example, let us say it is a business process. It can be looked at as a function in which people cooperate to get things done quickly and effectively, to leave time for other business functions to be performed within the daily time limits.

Supply chain involves a network of individuals in businesses that were involved with raw material production for manufacturing, manufacturer of goods, distributors, and retailers of produced goods. Supply chain is important in many businesses that involves selling goods and services to customer. In Thailand, there were researches on supply chain for food, tires, and medical supplies but not many. There were also several research involved in information sharing, strategies, management system design, and supply chain performance tools for business management.

Supply chain is the process that flows with deliver goods to consumer. It is important in many businesses and its management were studied for efficiencies and performance in production, operation, and service of goods towards customer. Supply chain management can be use in any industry that involves in a product manufactured from raw materials. It can be studied at many levels, regional or national. Thai national vaccine distribution, supply chain management were studied to increase efficiencies in distributions.

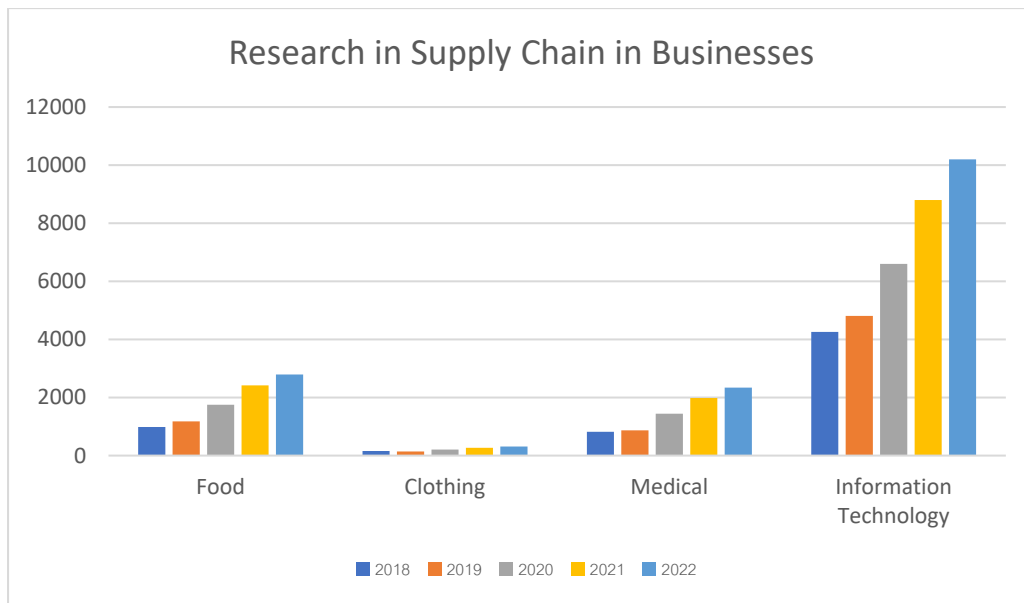
The importance of supply chain involves in management that causes operation cost-effectiveness, efficiencies in operations, inventory sustainability, logistics, budget-wise, and performance in operations, for example. The use of information technology has been important to supply chain as it increases transparencies between operations and improve visibilities for individuals involved. Information technology



can be use in information sharing in logistics, knowledge management, business operations, sales, and communication in business. All of these topics contributes to organization goal success and long-term achievement in business management and prevents business disruptions.

Information technology importance to supply chain involves maximizing visibility of processes, it can be in information sharing, such as cost-benefit sharing in healthcare. It can be use in logistic tracking of healthcare products to achieve healthcare goals in suppressing pandemic or distribution of drugs for chronic diseases in patients at hospitals. In food industries it has been use for distribution of raw materials into manufacturers and also use in distribution of goods to retail businesses. There was many supply chain research in food businesses to increase processes in production and distribution. Visibilities in logistics also can increase sales profits and retail efficiencies in operation management. In medicine, it can be used for optimization of government operations to secure medical supplies to help people. It can be use in hospitals to study number of patients in need of certain drugs and secure a number of drugs to meet number of patients need for long term use. In clothing and fashion, it can be used to optimize sales through visibility of which customer prefers which type of fabrics, colors, and graphics print on garment. For information technology business supply chain can provide visibilities on consumer that prefers which type of software or hardware that can increase profit by routing new equipment or software to nearest local dealer through marketing information that were shared among marketeers. Also, supply chain's importance also relies on the use of information technology for its visibility and transparencies that business management need. Because of supply chain's dependencies on information technology, a continual use and upgrades of information technology hardware and software increases with bigger data and the need for business operations' resilienceness. Supply chain increases use of information technology in terms of software and hardware for improve management and operation. It has increase sales and service of computer hardware, software, and maintenance services.

It has many uses that numerous researches were done, a chart representing number of researches in supply chain can be observed below.



**Figure 1** Source: *Google Scholar*

There were many studies involving supply chain in recent years. Supply chain is important in every business because all have studied supply chain before doing business and after launch of business, supply chain were studied along the processes to reach efficiencies and performances in management that brings resilienceness to business operations. Below can show importances of supply in businesses and Information technology.

### Supply Chain Importance in Businesses

Author	Research Involvement	SO	SS	BT	SM	SD
Riewpaiboon et. al, 2015	Optimize vaccine supply chain in Thailand	X			X	
Duan et. al, 2020	Block chain in Food Supply Chain			X		
Yu, Razon, and Tan, 2020	Drugs supply chain global sustainability for COVID-19		X			
Dehdar, Azizi, and Aghabeigi, 2019	Supply Chain Risk Management in Automotives		X		X	
Yang Li, 2022	COVID-19 and Supply Chain Management		X		X	X
Letizia, Giorgia, and Eleonora, 2021	Supply chain in Fashion Industry		X	X		
Cheung, Bell, and Bhattachariya, 2021	Logistic cybersecurity in Supply Chain Management		X		X	X
Lee and Mangalaraj, 2022	Data Analytics in Consumer Goods Supply chain		X		X	

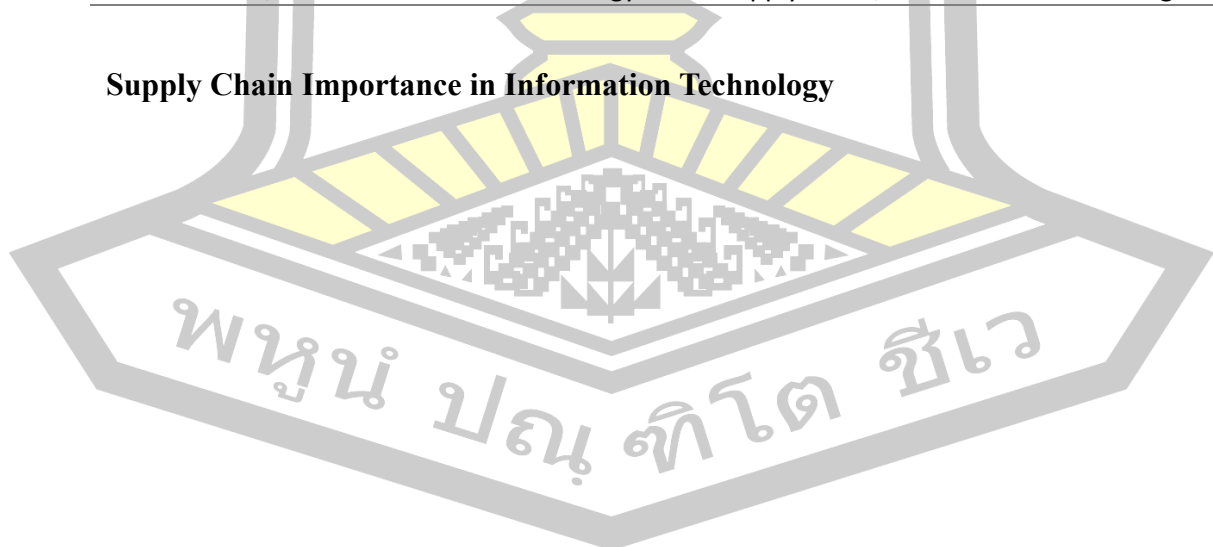
SO = Supply Chain Optimization, SS = Supply Chain Sustainability, SM = Supply Chain Management, SD = Supply Chain Disruption, BT = Block Chain

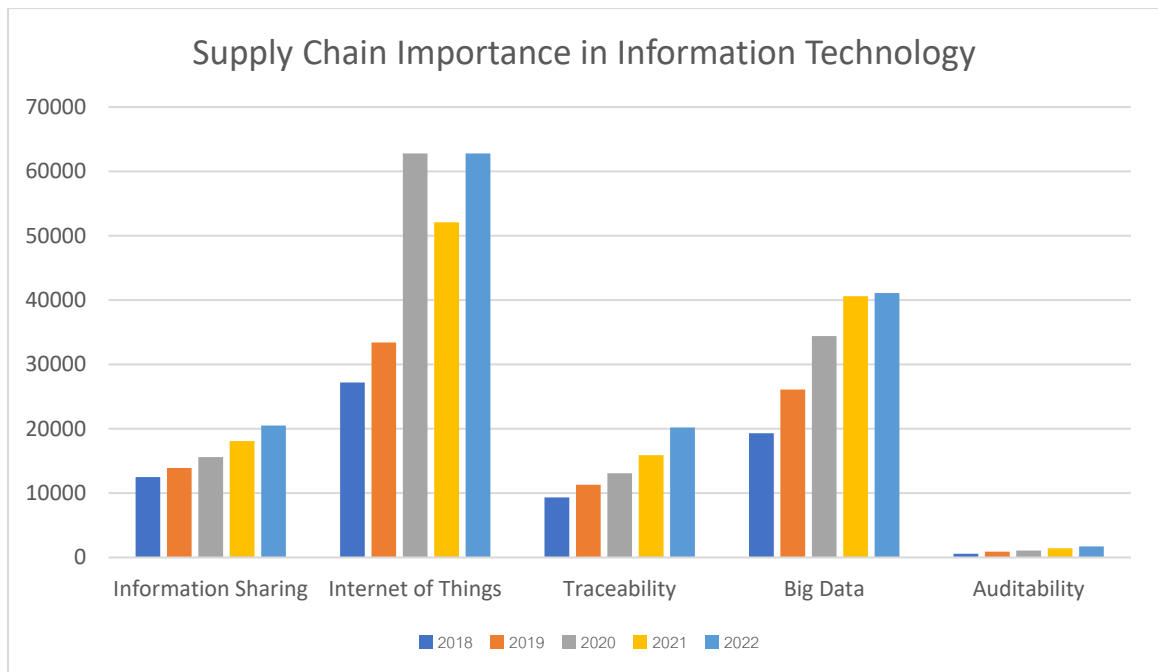
### Supply Chain Importance in Information Technology

Author	Research Involvement	S	PM	SC	IS	BT	IF
Nayak et. al, 2022	RFID technology benefits in fashion	X					X
Yaghin, 2020	Textile production and market planning		X	X			
Niemsakul, Singkarin, and Somboonwiwat, 2018	Healthcare cost-benefit information sharing			X	X		
Talwar, Kaur, Wamba, and Dhir, 2020	Big data and supply chain management				X		X
Nguyen et. al, 2018	Analytics in Big Data and Supply Chain Management					X	X
Varriale et. al, 2021	Block Chain Technology in Supply Chain					X	
Gurtu and Johny, 2021	Risk Management and Information Sharing						X
Chouki, Talea, and Chroqui, 2020	Barriers to IT use in businesses						
Bigliardi et. al, 2022	Information technologies in Supply Chain				X		X
Katsaliaki, Galetsi, and Kumar, 2022	Disruption and Resilienceness in Supply Chain	X					X
Lim et. al, 2021	Block Chain Technology for Supply chain					X	
Tavana et. al, 2022	Process in Text Mining Supply Chain				X		X

S = Sustainability, PM = Production and Market planning strategies, SC = Supply Chain Collaboration, IS = Information Technology use in Supply Chain, IF = Information Sharing

### Supply Chain Importance in Information Technology





**Figure 2 Source: Google Scholar**

Supply chain synchronization optimization for leveraging profits involved is important because it can bring reduction in cost in all operations, increase profits, improve visibility that hinders performance in network of individuals involved, and increase efficiencies of supply chain management through collaborations. All of this can make processes more agile, robust, and less time consuming, therefore more time is available for strategic planning of businesses that leads to better outcome and more achievable organization goals.

When it comes to leveraging profits in this research, consumer was studied for their adherences that reports usage of Bacopa Selext into web system that tracks usage amount per day. After that, amount of Bacopa tablets taken in consumers were review by pharmacy retail and government pharmaceutical manufacturer. Synchronization collaboration occurs between pharmacy retailer and government pharmaceutical manufacturer for retail order fulfillment, retail warehouse stocking, manufacturer production, and logistics. When all processes were defined and optimizes, it can save budget cost for government pharmaceutical manufacturer in production, logistic, warehousing, and bargained raw material purchases. Also, the retailer would have number of products available to long term customer while making new customer. Bacopa Selext supply in retail warehouse would be enough for making new promotions that can sustain profits through sustainable supply chain management.

Profits can be seen from save cost on all processes. More budget from save cost can be use to make better bargain of raw material purchases, this increases raw materials for productions that can increase numbers of products can be sell through promotions in pharmacy retail and pharmaceutical distributors.

The reason for this research is because Bacopa Selext is a new product that enters market and have a lot of potentials to become a popular supplement in the future. Similar to andrographolides in usage for COVID-19 infection, Bacopa extract can be used to help neurological deficits secondary to COVID-19 infection and treatment used in the future. Currently, Bacopa extract has been used to treat stresses, insomnia, anxiety, attention deficit disorders in teenagers, and improves memory and learning in geriatrics. From the wide range of use, it may cause shortages in market in the future. Also, the increasing number of geriatrics in Thailand would increase future amount of geriatrics with memory problems that may be needing Bacopa extract for use. Economic Intelligence Center (EIC) studies shows increase in 13% for the dietary supplement market (Tulaphol, 2017). The Amount of total expense by the population alone in the healthcare sector per year is around 3 billion baht, owing to multivitamins and minerals about 3%. So, there is roughly 97% left for the untapped resource. Information technology can also be helpful to marketeers that had less sale in a region. The use of information technology in consumer adherence may be use to route products better in terms of promotions that customer in some region don't buy much, it can be route to a new place within a cluster of retail or franchise for promotions that were accepted by many customers.

The research in this study had use information technology in tracking consumer use of Bacopa Selext that will enable pharmacy retailer and government pharmaceutical manufacturer to optimize their supply chain better and achieve supply chain resilienceness. From this, it can withstand the increase use in Bacopa Selext and prevents shortages in the market. Also, the nation would benefit from availability of Bacopa extract in the future if COVID-19 infection would require the use of Bacopa extract in alleviations of some neurological conditions. The use of synchronization in this study, would also help alarm when product sale is booming in the market and able to help retailer, distributor, and manufacturer to prevent Bacopa Selext shortages from

an optimized supply chain synchronization.

Supplement Adherence and synchronization of pharmacy retailer, distributor, and manufacturer hasn't been studied before, so there were needs to initiate the research to help retailer, distributor, and manufacturer perform better in supply chain synchronization to prevent market shortages and certain types of disruptions that can happen in the future.

The population in this study were male and female having age more than 40 years old to 85 years old. The age range were the population that begins to have deterioration in health from work stresses, anxiety, and memory problems. The study also aims at to study in regions across Thailand for better understandings of retail locations and bacopa users for better optimization of supply chain for government pharmaceutical manufacturer's operations towards pharmacy retailers and distributors in Thailand.

In summary, the adherence study in consumer would be used by the retailers to synchronize information with manufacturer. This is to create efficient stocking within the retail sector and manufacturing warehouse. The study aims at looking to see if manufacturer use that information to create plan, strategy, and forecast for the raw material procurement and productions. There was research on several usage of bacopa on patients under polypharmacy management, however no interactions were found. Selection of people into research have no bias against lifestyles that may report adherence usage. This is due to that bacopa has certain effects that helps clarification of the mental state, so it would rather alleviate the hang over caused by post alcohol consumption effect. Rather, the consumer might take food supplement to help alleviates the condition, like taking analgesics to reduce headache.

In terms of testing hypothesis, working towards sustainability in patient care and maintaining available treatment is crucial to business in nature. It is hope that this research outcomes would benefit those in search of research information that would benefit their future work or ideas that would produce positive outcome for the organization or for personal justification on operating business.



### **Importance of the Research**

The purpose of this study is to study consumer adherence that can be use in supply chain synchronization. It is an action that would considerably increase profits in both retail and manufacturing sectors. Effectively managing problems by tailoring and improving some parts of business operations, can help increase the wide range of profits. It's not only profits from raising capital income that are earned, but also the profit in how customers value the business, and in earning customers' trust. Real-world business faces income decreases as economic decline leads to less habitual spending from the population.

The purpose of the consumer adherence to supplement study is to explore key factors that lead to adherence; this leads to service quality improvement in the retail sector. On the other hand, the indirect profit of synchronizing adherence is using a web-based system to provide information on real-time usage of dietary supplement products. This information in turn can provide data for retailers and manufacturers to synchronize operations to meet market demands, thus, increasing earnings and profits on both sides. The web-based system is similar to the self-report system. This research aims at important main tasks below.

First, it examines the process to inquire information via a web-based system to promote consumer adherence through 1) pricing performance of the retailer, 2) product knowledge and its benefits to the customer – a part of customer education to let them know what benefits they are receiving from using the product, whether short-term or long-term, 3) sales promotion through pricing alone, and 4) consumer satisfaction. Factors involved in customer adherence to a product can be derived from studying the 6 key factors mentioned earlier. Also, synchronize able numbers of data can be derived from usage data analytics from the web-based system that can be integrated into the manufacturing system and the manufacturer's marketing system. This will benefit both retailers and manufacturers. The acquired information can determine whether such adherence improves retail operations in terms of 1) sales efficiencies and 2) sales performances. Adherence to supplements and some pharmaceuticals is necessary for the retailer's operation. Also, to adhere to a supplement is to create good health. Helping a patient to adhere also improves the

business' image and the product's image. It is a small part that is crucial to business success in the short term while launching the product, and in the long term in customer relationships. From adherence it seeks to continue product sales, and also a relationship with the retailer's employees, through long-term business commitments and customer companionship.

Second, to examine the acquired information to see whether retail operations' efficiency and performance improves retail stocking efficiency. It seeks to examine baseline operational strategy and planning. Then it seeks to optimize synchronization in retail sales, shelf stocking capacity, and efficiency with manufacturers' production management. It also helps to examine the marketing function of the retailer and production capacity of the manufacturer, during a specified time period. The information retrieved will be compared and contrasted to optimized synchronization, to see whether things improved and are ready for future production needs when the long-term product market is established. It also examines acquired information to see if retail stocking performance that stemmed from retail sales performance improves the performance of manufacturing operations. This will show that 1) profits increase from optimizing production performance, 2) profits increase from optimizing production agendas, 3) profits increase from optimizing synchronization, in terms of reduction in expenditures and resource allocation that is time-management linked. All of this is to examine whether performances improved each other or not. Also, it can foresee if there is need to invest in things such as new production machine systems, an office machine that enhances operation management, or innovative systems that increase transparencies and visibilities within the information pool of an organization.

Another point is to see if information from retail efficiency assessments can provide profits increase from optimizing efficiencies 1) in manufacturing, 2) in raw material procurement and lowering logistic costs, 3) in raw materials processing in-house, 4) in making reliable purchase forecasts, and 5) in supply chain sustainability. At this point the ability to sustainably provide raw material supply for continuous production and the ability to sustainably provide finished products to consumers from the warehouse through successful logistic operations will be assessed.

Third, to assess the acquired information to see whether warehouse operation



efficiency improves retail stocking efficiency. This is part of retail operation management, to oversee multiple factors that are related to product flow. This includes examining whether product sales flow differently during different times of the year, or if they rise and fall due to mortality numbers of the population in a given region. Base-line findings would be compared to later optimize synchronization between retail stocking and the manufacturer's warehouse. The study further focuses on optimizing the logistic on-time approach and fixed retail stocking dates, to see if larger retailers benefit from the synchronized logistical operations. It also examined acquired information to see if logistical operations performance overall improves retail stocking efficiency. This implies that products in the warehouse and on-shelf are replenished and available to meet customers' demands. Managers should be aware of how many people enter the business location, their interests in products, as well as of the well-being of the people in their families. This is crucial, because as people age, certain products might help their problems with aging. In this logistic context, we would assess prior product stocking during timeline events of the year, to determine if prior logistic planned operations met customer demand or not. Also, it would be compared to optimize versions of synchronization of manufacturers' logistic and retail stocking, to meet market demand. There is further assessment in optimizing the prevention of risk and disruptions of product delivery that may occur from certain risk issues.

Fourth, the research seeks to look into other types of profits from optimized supply chain synchronization from 1) product value, 2) business value, 3) customer relationships, 4) business survivability from pandemic disruptions, economic disruptions, and competitive disruptions. All four criteria are important to a business's survivability. Product value is important to the retailer's image and to customer's trust. It is the basis of a business's value to a society, how it progresses and evolves with a community to form a healthy society. How people benefit from products and services are the reason why businesses are still running. Business survivability is also assessed through series of disruptions that are emerging today and from the past. It can well be said that chronic and acute disruptions affect business health. This research will assess and evaluate whether a business can survive through this period or not. Further discussions on survivability details can follow the research findings.

## Importance of Research

Using information technology to create customer adherence has been built around using an electronic agenda for the purpose of reminder. This technology was built around changing from paper agenda to an electronic agenda for the convenience of patients. The mentioned technology was first used in the medical field for optimizing patient outcome through repetitive reminders. Use of the same technology to remind customers of food supplemental products can create a retail stocking efficiency that can be used to forecast future product stocking. Effective product stocking and checking can help create efficient sales forecasts. First-In First-Out (FIFO), is often used to recognize which product sells daily. Retail managers often keep track of which goods are moving throughout the day. Retail managers often keep track of which goods are moving throughout the day. Repetition of purchases enables sales forecasts at some point when customers make repetitive moves, when multiple customers purchase the same product over time. This type of action enables the retail store to keep track of and purchase large volume of products for sale to their customers over time. A large volume of goods enables negotiations for lower product costs. So, at this point the retailer can enjoy maximize profit from selling more goods over time, if economic conditions are good during this period, and risk of disruptions are appropriately calculated annually or quarterly. If one can extract the sales information individually, one can examine the product sales movement all year round. This type of information can be shared with manufacturers to synchronize operations. Maximizing profits are a key factor in running a retail business where there are shareholders. When annual profit reports show that the business is moving forward, a lot of investors may be attracted to purchase stocks and earn dividends. Business forecasts are not done only within organizations; many business journalists also keep track of business trends, and being informed, impart information to investors who are trying to manage their money when other stocks are failing. These statements are only of minor importance. There are also other important things in running a business, as business is one of the key factors in keeping a country's economy moving. So, returning to information-sharing on the movement of goods, the manufacturer should

be able to make a judgment how much raw material should be ordered to sustain production and maximize profit at the same time. This is similar to the counterpart in retail, but earning of profits comes from managing production and logistics effectively, hence lowering the cost of running the business, and maximizing profit.

Transferring knowledge about a product and its functional use can encourage a customer to use supplemental products continuously. Hence, continuous use can hinder sales promotion increase when the supplement product is proven successful for the consumer. A summary of continuous use can then be analyzed by retail managers for sales promotion, long term promotion plans, product stocking procurement planning, and other operations. This can ensure business survival for the raw material supplier, manufacturer, and retailers, when purchases are continuously made by consumers throughout the year. This in turn creates trust in shareholders in a judgeable manner, where they might look at pricing performance and sale-ability of retail chains, when looking at the everyday basis for each quarter of a year.

Retail supply management can be synchronized with manufacturing, and can also be examined when new customers come into contact, when a product has more customers, such as when the country's economy expands and people have more money to spend on their health. Retail supply management and manufacturer synchronization can also use this data to forecast sales when economic conditions are a concern, such as when the economy is in a dormant stage. Cost-saving high-volume purchase of raw materials can lower the price of the product, and manufacturers can still manage to keep the product in the market. This increases the sustainability of the supply chain and increases trust within retailer's and manufacturer's supply chain synchronization.

The use of IT technology can help consumers to adhere to products, and that enables retail managers to forecast the product sales, manage the order cycle from manufacturers, and be able to schedule the logistical date for product arrival. From all accounts, one can see that there's a need for a strategic operation change in order to maximize production capacity when product market demand is increasing. Retailers can share this information with manufacturers, so that they can make changes in manufacturing operations and made correct decisions for raw material procurement in order to sustain the supply chain. In addition to overseas procurement, manufacturers

can optimize their operations and logistics to increase product quantity and to deliver products at the exact time they are needed by retailers, meaning that ordered product stocks will not cause conflict with other manufacturers' logistics of other retail products. Manual input of computerized ordered retail products is time-consuming, and if scheduling is efficient, then more retailer's workers can interact with customers better.

Procurement of raw materials is crucial when it comes to business survival. Forecasting external factors such as natural disasters, political disasters, economic disasters, pandemic disruptions, and health risk concern disasters for some health products can provide means to avoid business disruption. Sectors that will benefit from this research are retailers, manufacturers, and financiers. The information gathered from the research can be summarized as data for decisions regarding financial loans and operations within synchronized business networks.

The above-mentioned is a summary of what has been a minor detailed discussion. So, henceforth with this research, more insights will be looked into, to magnify visibility of how businesses interoperate, so that what economists call the market sector can be acknowledged and regain its reputation.

This research seeks to inquire about the use of information technology, to promote consumer adherence. Consumer adherence in a web system has information that can be use by pharmacy retailer and government manufacturer to prepare for retail warehouse stocking and be ready to sustain Bacopa Select to consumer within the region of retail operation. This was done through synchronization with manufacturer production. From synchronization of pharmacy retailer and government pharmaceutical manufacturer, supply chain was able to sustain market demand and increase in consumer number. Also, in the research would portray how web synchronization can alarm the manufacturer's production when increase customer of customer in reach region would cause a market boom and how the web synchronization may help prevent disruption in market shortages.

Hypotheses in this research was made to find relationship between variables that were important to business operations in pharmacy retail and manufacturing productions. This can confirm variable relationships and significance that can be used

to verify that web system synchronization relationship is important at significant level and can be include into conventional management with confident.

Also, with the interviews of consumers, can give more insights into thoughts and feelings of consumers at the present time. Interviews from pharmacy retail managers and government manufacturing managers can also give comments and emphasizes into pharmacy retail and manufacturing operation management that can lead to supply chain resilience and sustain profits. The interview from this research would give more information available from viewpoints that is valuable for future research.

### **Hypothesis of the Research**

#### **Hypothesis Group 1: Consumer Behavior in Synchronization with Retail Operation Management**

- 1.1 Pricing Performance Affects Customer Adherence
- 1.2 Sales Efficiency Affects Customer Adherence
- 1.3 Retail Stocking Efficiency Affects Customer Adherence
- 1.4 Customer Satisfaction Affects Customer Adherence
- 1.5 Sales Promotion Affects Customer Adherence
- 1.6 Product Knowledge Affects Customer Adherence
- 1.7 Consumer Adherence Affects Retail Sales Performance
- 1.8 Retail Sales Performance Affects Retail Stocking Efficiency
- 1.9 Retail Sales Performance Affects Retail Profit Performance
- 1.10 Retail Sales Efficiency Affects Retail Profit Performance

#### **Hypothesis Group 2: Retailer and Manufacturer Supply Chain Synchronization**

- 2.1 Retailer Stocking Efficiency Affects Efficient Production Strategy
- 2.2 Retailer Order Fulfillment Affects Efficient Production Operation
- 2.3 Retailer Stocking Efficiency Affects Efficient Warehouse Strategy
- 2.4 Retailer Stocking Efficiency Affects Efficient Warehouse Operation
- 2.5 Retailer Order Fulfillment Affects Efficient Logistic Strategy
- 2.6 Retailer Order Fulfillment Affects Efficient Logistic Operation

2.7 Retailer Order Fulfillment Affects Operation Efficient Budget Expense

2.8 Manufacturer Operation Strategy Affects Efficient Supply Chain Sustainability

2.9 Manufacturing Performance Affects Profit Performance

2.10 Manufacturing Efficiency Affects Profit Performance

### **Scope of the Research**

The research focuses on the importance of synchronization in optimizing operations of pharmacy retailers, pharmaceutical supply distributors, and manufacturer of Thai government pharmaceutical organization. Retailers and distributors included in this study consist of government-owned retailers and private retailers. There is also customer information technology usage in synchronization, in getting consumers to adhere to usage of a retail product, Bacopa Selext.

The subjects of the study are male and female, aged over 40 and less than 85 years old, as this is the age where cognitive functions may start to partially decline due to accumulated mental stress. The duration in retail synchronization study is six months. Information from consumer use and manufacturing operations would be synchronized and use for optimizing supply chain that can bring direct and indirect profitability from increase efficiencies and performances in operations. The study is country-wide, all regions of Thailand is taken into account.

### **Keywords**

Information Technology Management, Supplement Use Adherence, Synchronization, Supply chain, Leveraging Profitability

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## CHAPTER II

### LITERATURE REVIEW AND CONCEPTUAL FRAMEWORK

#### Literature Review

Supply chain synchronization theory has developed throughout the world, as commerce has progressed over time. Some European researchers say that it began in 1990. However, Americans say that chain synchronization began to evolve as far back as the early 1980s, when analog devices began to shift to digital. The development of personal computers began to affect the market.

About in 1999, the Point-Of-Sale (POS) system first began to be used within supermarkets and retail stores. At this time Stank et. Al, (1999) came to research more on its use. There are several theories about the supply chain and supply chain synchronization. The latter, supply chain synchronization, evolved around the fact that commercial organizations needed interact intelligently with the supply chain, in order to stay competitive in the market.

There are researchers interested in supply chain synchronization who promote efficiency through shared knowledge between retailing operations and manufacturing operations. In the present, there are several researchers who still keep pace with the supply chain synchronization that works toward the use of information technology to solve problems. For example, Chen, et al. (1999) with the study of the bullwhip effect and Richard Addo-Tenkorang, et al. (2019) with the study of track and trace supply conceptual framework. With the simple use of information technology and the use of computers, many researchers have tried to develop concepts that solve problems and demands of business today. Many works of research concerning food and drugs have been done in recent years. Many studies have been done on food supply chain and drug supply chain synchronization.

This study will look at the use of IT tools to examine consumer adherence to a food supplement product, and will follow the progress of continuous usage.

Continuous usage can provide data to retailers that they can use to make sales promotions, sales forecasts, and purchase forecasts from manufacturers. This study also seeks to find if there is profit leveraging from the operations of supply chain synchronization between retailers and manufacturers. It examines the direct effect of consumer adherence to a product, and also watches for profits that rise in an indirect manner.

Much to be discussed here is from five literature reviews that fulfill the aspects of this dissertation. Compliance to a drug regimen consists of around 40 percent, from 25 literature reviews that are related to drug use.<sup>1,2,6,8,11,13,14,16,20,22,25</sup>

From this it can be derived that the quality of active ingredients and their effects is the first thing crucial to adherence. It can be seen that barrier<sup>2,17</sup>, patient-centered care<sup>9,12</sup>, and behavioral factors<sup>15,17,26</sup> are also crucial aspects to adherence. Certain long-term use and care are also seen.<sup>7,13,15,16,21</sup> A number of reviews of influencing factors also appear to be the same as care retention.<sup>5,11,15</sup> These reviews commonly provide knowledge regarding continuous use of certain drugs. However, the term “adherence” also refers to using a medicine correctly according to prescription, such as avoiding the use of medicines while driving. A few numbers of literature reviews have been studied in dietary and supplement use. Also, in Thailand there hasn't been adherence study that were use in supply chain research. If adherence behavioral studies can be conducted and synchronized with retail operations, it will lead to knowledge that can be beneficial to manufacturing and logistics operations in the future.

There are six total relevant literature reviews on supply chain management and synchronization. Mainly the literature reviews focus on strategy<sup>3,7,9</sup>, risk management<sup>3,4</sup>, sustainability<sup>8,9</sup>, social influence<sup>2,7,8,9</sup>, information management<sup>5,6</sup>, and green technology<sup>2</sup>. There are a total of 6 main approaches to solving problems in sustainability through collaboration and synchronization of operations. There are a total of 6 main approaches to solving problems in sustainability through collaboration and synchronization of operations. There are sub-categorical important factors in each area that determine its role in management. There has also been the rise of new concepts in synchronization during this decade. However, such new concepts haven't



been extensively researched. Much work has been done on common manufacturing of products. There has been insufficient evidence for studies on the supplements industry, thus the research in this dissertation.

Literature reviews on logistic management are the earliest works on synchronization framework and practices. Later on, management areas picked up and adopted the practices. Much operations have been focused on design and planning<sup>1,5</sup>, vehicle routing problems<sup>1,4,5</sup>, and natural disasters<sup>4,5</sup>. The human factor, production and logistics, management control, inventory management, production planning, and reverse logistics also were integrated into certain works of research seeking deeper understanding of existing problems.

COVID-19 and its effect on logistics appears to be an important research subject, within the time frame of its emergence.<sup>3</sup> There is a lot of research showing that mathematical models have been proposed for logistic routing. Former research was concerned primarily with cost-savings for distance travelled annually. With the appearance of COVID-19 pandemic disruptions, certain routes may have had to have been avoided and that may have affected logistic costs for participating businesses. Further research can be done to examine the effect of COVID-19 disruptions on costs for logistic operations. Assessments can increase awareness of the important matter of pandemic disruptions, and minimize risk for employee operations.

Literature reviews on retail operations mainly focus on risk assessment<sup>1,5</sup>, barriers to care<sup>1,6</sup>, packaged goods<sup>2,5</sup>, policies<sup>2,6</sup>, operation management<sup>2,3,4,5</sup>, care mechanism<sup>3,5,6</sup>, quality management<sup>3,5,6</sup>, strategy synthesis<sup>4,5</sup>, and the supply chain<sup>4</sup>. Many literature reviews have been concerning pharmaceutical industries and the food sector. Within the literature review, most works have been completed to look at risks and barriers stemming from patients, plus management strategies of health professions on care, policies, and supply management. There are still insufficient studies on retail operations synchronizing with manufacturing operations. Within this existing research, there is also the emerging use of digital innovations in business operations. That can be integrated, and its importance will be discussed at the end of the dissertation.

## Literature Reviews

Table 1 Literature Reviews on Adherence Behavior

Literature	D C	A H	B F	A B	C M	I N	G S	F I	C R	P C	K N	Q L	W M	P P	B H	D F
1 Manmohan, Sreenivas, Sastry, Rani, Indira, and Ushasree, 2012	X	X			X	X										
2 Rashidi, Kaistha, Whitehead, and Robinson, 2020	X	X	X	X												
3 Lorito, Bosco, Booth, Goldberg, Harwood, and Wardt, 2020		X				X	X									
4 Faulkner, Dijk, Drake, and Bee, 2020		X				X										
5 Eicher, Knop, Aszodi, Senner, French, and Wollenberg, 2019		X						X								
6 Vermeire, Hearnshaw, Royen, 2001	X	X														
7 Tucker, Tso, Hall, Ma, Beanland, Best, Li, Lackey, Marley, Rich, Sou, and Doherty, 2017		X							X							
8 Lieveld, van Vlerken, Siersema, van Erpecum, 2013	X	X														
9 Conn, Ruppap, Enriquez, and Cooper, 2016		X								X	X	X				
10 Dounavi and Tsounami, 2019		X											X			
11 Zomahoun, de Bruin, Guillaumie, Moisan, Gregoire, Perez, Vezina-Im, and Guenette, 2015	X	X			X	X		X								
12 Alsadah, van Merode, Alshammari, and Kleijnen, 2020		X			X	X				X				X		
13 Pednekar, Agh, Malmenas, Raval, Bennett, Borah, Hutchins, Manias, Williams, Hiligsmann, Turcu-Stiolica, Zeber, Abrahamyan, Bunz, and Petersen, 2019	X	X							X						X	
14 Sletvold, Sagmo, and Torheim, 2020	X	X														
15 Zeber, Manias, Williams, Hutchins, Udezi, Roberts, and Peterson, 2013		X						X	X							X
16 Presley, Groot, and Pavlova, 2018	X	X							X		X					
17 Webster, Brooks, Smith, Woodland, Wessely, and Rubin, 2020		X	X													X
18 Picorelli, Pereira, Pereira, Felicio, and Sherrinton, 2014		X											X			
19 Puts, Tourangeau, Howell, Fitch, Springall, Alibhai, 2014		X						X								
20 Holmes, Hughes, and Morrison, 2014	X	X									X					
21 Van Boven, Chavannes, van der Molen, Rutten-van Molken, Postma, and Vegter, 2013		X			X				X							
22 Abahussin and Albarrak, 2016		X	X													
23 Van der Wardt, Hancox, Gondek, Logan, das Nair, Pollock, and Harwood, 2017		X											X			
24 Jaam, Awaisu, Ibrahim, and Kheir, 2017		X		X				X								
25 Shariff, Dahmash, Kirby, Missaghi, Rajabi-Siahboomi, and Maidment, 2020	X	X														X
26 Tam, Wong, and Cheung, 2020		X									X				X	

**DC = Drug Compliance, AH = Adherence, BF = Benefits, AB = Adherence Barriers, CM = Cost of Medication, IN = Interventions, GS = Geriatric study, FI = Factors Influencing, CR = Care and Retention, PC = Patient Centered, KN = Knowledge, QL = Quality of Life, PP = Polypharmacy, BH = Behavioral Factors, DF = Dosage Form**

**Table 2 Reviews on Manufacturer Supply Chain Synchronization**

Literature		S	R	T	S	S	B	C	G	S	S	C	O	I	I	S	S
		S	M	R	G	C	E	B	S	T	P	S	C	E	M	R	F
1	Van der Vorst, 2004					X	X	X									
2	Olga, 2012					X			X	X	X	X					
3	Carter and Easton, 2011		X	X	X	X							X				
4	Mukhamedjanova, 2019		X														
5	Konovalenko and Ludwig, 2019					X								X	X		
6	Syntetos, Babai, Boylan, Kolassa, and Nikolopoulos, 2013					X								X			X
7	Barbosa-Povoa, da Silva, Carvalho, 2018				X	X				X							
8	Govindan, Shaw, and Majumdar, 2021	X				X											X
9	Bhatt, Ghuman, and Dhir, 2020	X			X	X				X	X						X

SC = Supply Chain Management, BE = Bullwhip effect, CB = Collaboration, GS = Green Supply Chain, SS = Sustainable Sourcing, SP = sustainability performance, CS = Corporate Social Related, RM = Risk management, OC = Organization culture, SG = Strategy, TR = Transparency, IE = Information Management/Event Management, SF = Supply Chain Forecasting, ST = Social sustainability, SR = Social Performance Related

**Table 3 Literature Reviews on Logistic Operation Management**

Literature		R	H	M	P	R	D	I	P	P	V	C	P	N
		S	F	C	L	L	P	M	P	E	P	O	F	D
1	Govindan, Soleimani, Kannan, 2015					X	X	X	X	X	X			
2	Fabio, Grosse, Neumann, Battini, Glock, 2020		X	X	X									
3	Luo, Yu, Jiang, and Wang, 2020		X									X	X	
4	Gaudet, Simeoni, Gwynne, Kuligowski, Benichou, 2020	X									X			X
5	White and McCallum, 2018						X				X			X

RL = Reverse Logistic, DP = Design & Planning, IM = Inventory Management, PP = Production planning, PE = Performance Evaluation, VP = Vehicle Routing Problem, HF = Human factor, MC = Management control, PL = Production & Logistic, CO = Covid-19, PF = Psychological factor, RS = Resilience, ND = Natural Disaster

**Table 4 Literature Review on Retail Operations**

Literature		M	D	K	C	R	B	C	N	P	P	O	C	Q	Q	S	S	S
		A	S	M	T	A	C	O	C	G	C	M	M	M	H	N	S	S
1	Kooyman and Witry, 2019				X	X	X											
2	Ayseli, Aytekin, Buyukkayhan, Aslan, and Ayseli, 2020							X		X	X	X						
3	Tello, Barbazza, Waddell, 2019										X	X	X	X	X			
4	Settanni, Harrington, and Srail, 2017											X				X	X	X
5	Peleg, 2013		X	X		X				X		X	X	X	X			X
6	Morley and Cashell, 2017	X					X						X	X				

CT = Care Transition, RA = Risk assessment, BC = Barrier to Care, NC = Nutraceuticals, PG = Packaged Goods, PC = Policy involved, OM = Operation Management, CM = Care Mechanism, QM = Quality Management, QH = Quality Healthcare, SN = Supply Network, SS = Strategic Synthesis, SC = Supply Chain, OA = Operation Assessment, KM = Knowledge management, DS = Decision support, MA = Management assessment

As mention earlier in the beginning of the chapter, supply chain in general is a business network of people whom were involved with production and selling of products. This may include raw material producer, manufacturer, retailer, and distributor. It involves every process in between the work of these individuals within the network of business of acquiring raw materials for production, logistics, and selling of produced goods.

In Thailand, many supply chain research has been focuses on agriculture, national healthcare, foods, retail businesses, clothing, automotives, smart cities, and information technologies. Many researches in Thailand were in supply chain performance, and supply chain efficiencies research food, healthcare, and industrial automotive parts. Researches complete were related to existing industries within Thailand. It was complete for optimization of business process that were need for improvements. There were also researches in prevention of disruption in supply chain such as pandemic disruption, supply chain and logistics management. In smart cities, there were also research in big data analytics, text mining, block chain and internet of things in supply chain management. An examples of supply chain studies in Thailand can be seen in table below.

### Supply Chain Study in Thai Businesses

Author	Research Involvement
Kittipanya-ngam and Tan, 2019	Digitization of Food Supply Chain
Jernsittiparsert, Wattanapongphasuk, and Phonwattana, 2019	Food industry's supply chain and performance
Abe and Ye, 2013	Natural disaster disruption and supply chain resilienceness
Kantasa-ard et. al, 2020	Machine learning and demand forecasting and supply chain
Jernsittiparsert and Rungsrisawat, 2019	Information sharing and operational performance in supply chain management
Jankaweekook, Chaiyawat, and Sinthupinyo, 2019	Risk management in automotive supply chain

The supply chain synchronization optimization in this research aims at improving the processes in supply chain management through usage of information technology as information sharing and visibility for pharmacy retail operation and manufacturing operation. When number of consumption is available, a more accurate forecast can be made for retail sale, retail stocking, manufacturer production, marketing, and logistics. It also gives information on product use distribution within a country and serve as epidemiology information for the national healthcare administrators. Furthermore, consumer can use web tracking as information usage of current supplements to present to physicians in the future. The optimization in supply chain processes of interests were in consumer adherence that continuous use presents a number of product to be use at current time and in the future, pharmacist care on adherence that affects retail warehouse stocking and synchronization with manufacturer to sustain supply chain. This was for long term use, promotion, and prevention of shortages. Another optimization was the operations in between manufacturing and logistics that can save budget and use that budget for procurement of raw materials at a bargain price. This enables manufacturer to make more money

from more products, thus increasing raw material supplies in raw material provider because they would have to stock continuously also. The collaboration between consumer, pharmacy retail, pharmaceutical distributors, and government pharmaceutical manufacturer in this research would help to create a sustainability in Bacopa Selext and prevent shortages in market. With this research can present a framework that can bring sustainability to supply chain that can be use with fast consumable goods and brought business resilienceness in the future.

In Thailand, there has been research work on cost-benefit sharing in healthcare supply chain. (Niemsakul et. al, 2018) and there were also supply chain management performance studies in pharmaceutical companies in research work by Thammarak and Witthaya. (Thammarak & Witthaya, 2020). However, at the present time there were little or no supply chain synchronization study and information technology collaboration in application to synchronization on increasing performances and efficiencies of pharmacy retailer and manufacturer. So, this was the need for the research in this field that has application of information technology to optimize business operations that would bring more profits and sustainability to supply chain. Also, this research would be a pioneer research that can bring many research in the future that is in the field work of supply chain synchronization, consumer adherence in healthcare, synchronization optimized retail operations, and synchronization optimized manufacturing operations and logistics.

### **Information Technology Collaborative Framework**

There are various factors affecting how a customer chooses products and services. This study aims to study 1) pricing performance of retailers, 2) product knowledge and its values, 3) sales promotion through pricing alone, and 4) consumer satisfaction. These 4 cores of impact factors will predict whether consumers will purchase the product from time to time. It also seeks to answer the questions of customers on suitability, health benefits from long-term usage, and whether the purchase is economically it. Within the framework, collaboratives synchronization aims at optimize the items mention below.



First, the research inquires whether such adherence will increase retail operations. The research looks into how well the retail sector performs in sales efficiency and sales performance. Detailed results from this would enable a wide perspective of how businesses should operate in the near future and far future. It can pin-point whether or not consumers are satisfied with the results of products and services. If customers are happy, retail sales should increase and their performance in pricing and promotions would increase too. This will help sustain the survivability of the retail business in the future, when disruptions occur.

Second, the research inquired if retail sales operation efficiencies and sales performances can improve retail stocking efficiencies. This research tries to see how retail operators can forecast sales and forecast the amount of goods that need to be restocked. This would ensure that there will be enough products in stock for display and for sale to customers. Preventing a shortage of goods is a must for the store manager. Also, economic studies in the area must be taken into consideration, since the launching of products with almost no consumer business operations in the particular area would be nonsense. Optimizing synchronization in retail sales stocks, with warehouse stocking by manufacturers can provide faster response to meet customer demands.

Third, the research aims to determine whether improvement in retail stocking performance can improve manufacturing operations, aiming at answering manufacturing performance. It shows how the profit increases indirectly from management of operations within two sectors, the retailer and the manufacturer. This first part is called profit increase from optimizing synchronization; it seeks to find reductions in total expenditures, resources allocation, and efficiency in time management. The second part is to find whether profits increase from optimizing production agendas, how well the manufacturer responds to the retailer's order fulfillment requests. Can the manufacturer plan everything prior to production? This research will look further into the human resource department where people are managed to do their jobs. The third part is to see profits increase from optimizing production performance. The third part is to see profits increase from optimizing production performance. This will look at how well the manufacturer takes care of their human and machine resources. It looks into how the manufacturers take care of

their machines. If everything is taken care of, when there is a machine disruption, other machines or older machines can pick up the job and complete the rest of the task. Also, it also examines how managers utilize their time in dealing with problems and analyzing what to do with unprocessed raw materials, so that the problems can be solved, and products completed on-time to meet customer demands. The goal of this section is to thoroughly examine how manufacturers process their operations and products. If everything is taken care of step-by-step, then problems should not cause disruptions. First, the research focuses on the importance of manufacturing efficiency. It can provide knowledge of how profits increase from optimizing manufacturing efficiencies. It looks into 4 subcategories: 1) raw material procurement and lowering logistic costs. The research will examine how the manufacturer purchases the raw materials and how they are sent to the manufacturer. The research will examine how the manufacturer purchases the raw materials and how they are sent to the manufacturer. The cost of the raw materials may vary from time to time. The research seeks to know whether the manufacturer is able to enlist new raw material producers or wholesalers, and is able to contact for purchase to secure manufacturing. It also seeks to know if the manufacturer is able to fulfill orders on time and save money from ordering to gain more profits from selling to retailers. This point is important, because the direct effect of managing orders for raw materials effectively can provide indirect effect, that, is gaining more profits from bargaining before purchasing raw materials. More raw materials gained per baht can provide more profits in the end, when the products are sold to retailers. This type of data would be beneficial in each stage of manufacturing that goes through phases of economic changes within the country. There are times when the country's economy is better, and times when it is not as good. Also, many nations are in competition in this world, and businesses seek to make contacts to find business partners. 2) Raw materials processed in-house. At this important stage, the raw materials are examined at storage areas, and manufacturing operations are also examined. The production process goes through many stages of mixing, sorting, and polishing before it reaches consumer's hands. This is where quality of product is selected, sorted, and processed into finished consumable products. The research examines how products are made, step-by-step, how effectively the manufacturer can speed up the process when there are high



market demands, and how effectively the manufacturer can avoid disruptions at each specific point of production. The research examines how products are made, step-by-step, how effectively the manufacturer can speed up the process when there are high market demands, and how effectively the manufacturer can avoid disruptions at each specific point of production. The importance of how products are made makes the industry valuable. It is also one of the keys factors that some business securities are looked further into when the finance sector is involved. Machine capabilities and industrial worth are also looked at when bankers have to make financial decisions whether to give loans or not. Sometimes, businesses do not perform well. If bankruptcy happens, the financial sector will confiscate all the business's entities that the law allows. Quality of products is also often checked, as is efficacy in terms of consumption of quantifiable active ingredients. The supplement mentioned throughout this thesis also has active ingredients that are extracted from raw materials. However, with the governmental rights of purchased know-how from Naresuan Ethnobotanical Researchers, extracts are produced within the laboratory. However, with the governmental rights of purchased know-how from Naresuan Ethnobotanical Researchers, extracts are produced within the laboratory. These purchased certificates withhold information from the manufacturer that might be a source for calculation for individual tablets or capsules being produced. The supplement from the dietary supplement manufacturer had the raw materials extracted through the government laboratory. In this thesis, "raw material producer" refers to farmers and dried herbal powder wholesalers. The supplement referred to in this research is a vegetable consumed by people throughout Thailand. Consuming it in large quantities every day would make it impossible for humans to consume other foods. So, the vegetable is processed through extraction to obtain a fair number of extracts containing supplemental active ingredients that can help people increase their mental function and body stamina. In-house operations are important when logistic timing is scheduled by retailers, so that their stocking of non-healthcare products is not disrupted. When logistic factors come into account, the manufacturer has to make a schedule of when to process the product. Also, if the logistics are rescheduled for whatever reason, sometimes the manufacturer has to reschedule the production to meet the retailer's demand. For example, a long-holiday within the country may cause

traffic jams in and around metropolitan areas. Traffic delays can also occur while outbound to other provinces during times of national long-holidays. Machine disruption is another thing, though if calibrated often and thoroughly checked before processing, this should cause no problems for the in-house processing. In a worst-case scenario, if the machine breaks down for some reason, such as power outlet causing electronic parts malfunction, then the manufacturer should have some kind of secondary solution to solve the problem. For example, the manufacturer should have semi-automatic machines ready to operate when a problem arises, and should have the right person with the right knowledge to work with semi-automatic machines. Other types of machines such as manual filling and capsule filling should be available and examined for production efficacy and performance by the production manager. The importance of examining the efficacy of machine and man power within this section is that it would provide the knowledge necessary for estimating the number of products that the manufacturer can produce during a machine-fault disruption. This means that the manager should be able to calculate how much the automatic system can produce, e.g., 100000 capsules at a non-exhaustive speed within an 8-hour work shift, how much can the semi-automatic system produce, e.g., 40000 capsules within 8-hours, and, how much can a manual system produce, e.g., 20000 per day within an 8-hour work shift. The production manager should be able to do a simple calculation to determine whether over-time workers should be needed to keep up production during a machine-fault disruption. Moreover, the flexibility of people who have know-how should be taken into account. For example, in case more products are needed during a high-demand phase during a machine-fault disruption, the production manager might call in an experienced worker who can produce 25,000-35,000 capsules per 8-hour work shift. 3) Make reliable purchase forecasts, because the industry often has to make supply purchases and it is important how effectively they can they make those purchases. As the seasons changes, farm crop outputs are affected by weather, by market demands, and by government policies. Farmers tend to plant crops that produce more cash, rather than other crops. When it comes to the production of dietary supplements, the government might get involved to keep up the production of the necessary crops. However, at this time there is limited knowledge of how governments are acting on the matter. The manufacturers also have to be

examined for raw materials procurement, in terms of where they order their dried materials before laboratory extraction. By studying these matters, one can derive some knowledge on how the manufacturers handle the raw material quantities at hand. During a high-demand phase, they might order dried herbal powder from China or India. So, there are many steps before decision can be made. The manufacturer has to make a self-product market assessment and also a market assessment for competitors' products. Competition is become another type of disruption when the products are similar to each other. Pricing of raw materials for dietary supplements might vary due to many factors. Shortages may cause the product price to climb up due to logistics from other sources. Another factor might be raw materials sitting too long from one source, so prices might be high to compensate for business expenses for employees. Also, when the market share of finished dietary supplements is high, sometimes prices may go up from producers or a wholesaler who sees others selling high, and wants to sell high, too. So, governments need to control prices, if there is to be a future for the cash crops used for dietary supplements, due to their increased use. Whatever number of potential users, those who are with a diseased-type of illness may find it is useful when consumed and symptoms are alleviated. illness should be looked at. Knowledge on this subject is only at the preliminary stage, so much more exploration needs to be done. 4) Supply Chain Sustainability. This part studies two matters: one is the ability to securely sustain raw material and the other is to secure the supply of finished products to suffice the market demand. At this point, there will be a study of the ability to sustainably provide a raw material supply for continuous production, as this would ensure the sustainability of the supply chain. The importance of this is that the manufacturer can sustainably provide long-term product numbers within the market, so the product does not go out of stock when consumers come to purchase. Also, if the consumer doesn't see the product at the point of purchase, they might switch to another brand with a similar product. This will give rise to competitive disruption that can affect the manufacturer's markets. Dietary supplements are different from other types of supplements. The manufacturer does not have to be concerned about products going off of the market, so forecasting how much raw materials should be bought before the finished product reaches the end of the product's life cycle should not be of concern at this point. Dietary supplement

manufacturers' decision to manufacture dietary supplements for mental health is also a boost for sustainability of government capital earnings. Another question to be examined by the research is the ability to sustainably provide finished product to consumers. This is important, because while current customers are retained, there are also other customers who do not know about the product's benefits. So, when they come into contact with the retailer and the knowledge of product benefits is transferred to the customer, a sale is made. This means that the market demand margin is going up simultaneously too. For example, if there were 10,000 retail points within the country and there were customers walking in every day in a very dense area. If a new product were introduced, sales might happen if the product price was not high, and if the population within the country included a lot of middle-aged and elderly people. Dietary supplements are a type of product that can reach high-demand within a very short time, not only because of aging and mental disability from dementia and Alzheimer's disease, but also because of those people with poor mental stamina who are suffering from long hours of work and restlessness. So, retail and manufacturing managers need to be questioned about how much they know about the product's capability to be sold in a very short time. Similar to a sudden increase in population after a long period of a steady population, this is a type of product that a sudden increase in demand can happen when the right time comes.

At the end of this stage, it also aims to inquire whether supply chain synchronization affects business survivability from pandemic disruptions, economic disruptions, and competitive disruptions. This is to ensure that the continuity of marketed products and future manufacturing of the products will be secure from certain types of disruptions. Assessments and evaluations can be discussed to find future solutions if new problem arise and if old problems still persist.

Fourth, the research will inquire if logistic operation efficiency improves retail stocking efficiency, and will see if there are any reports going on between the retailer's point-of-sale and the manufacturer's computerized warehouse system. The first part focuses on optimizing synchronization between retail stocking and the manufacturer's warehouse. The second part focuses on optimizing a logistical on-time

approach for a fixed retail stocking date, and would examine if the goods arrive on-time on the date the retailer set. This section deals only with how managers effectively planned, scheduled, and prepared the boxes of dietary supplements within the warehouse inventory, to be ready for pick-up and to see if the goods arrived on time or not. This requires communication between the warehouse manager, logistic manager, and retail manager. The way they manage tasks and communicate with each other might be by computerized system, or on paper, depending on the organizations' culture and on how they work. This often affects visibility and how people work. Sometimes, when working on paper, an operator has everything at hand and can scroll through the papers to see everything, as it is all visible. Sometimes IT is convenient, but if there's a new employee or trainee, there might be lack of data input, as human errors are prone to happen at the beginning of job training. During replenishment of items into specific areas of the retail store, there is an inside task of doing FIFO, and the research questionnaire would be mentioned on part of the retail operation. The second part of optimizing a logistical on time approach with a fixed retail stocking date is overseen if the managers plan and schedule everything on time to meet the retailer's demand on the date of retail stocking. This is to avoid work overloads on the retailer's part. If jobs are not spread out evenly throughout a week, the employee can become fatigued through overtime. Fatigue leads to mental stumbling and health problems, such as being susceptible to catching colds, flus, and other infections. So, if retailer managers aren't managing employee's tasks well, it may lead to business inefficiency. It can lead to all kinds of problems. Tasks are not performed properly, and employees end up spending more time on paper-work and product stocking, rather than making sales to customers. When employees don't get enough rest, their communication with customers may not be as good as usual. Even tailored communications cannot break through into helping customers understand their needs. This leads to inability to understand how the product works correctly and how its benefits would be received.

Fifth, the research aims to inquire if improved logistical operation performance improves retail stocking efficiency. The research focuses on logistics being on time to meet current demand of customers. It looks at the synchronization between retail stock and manufacturer's warehouse stock. The importance of the two



parts in this section would give answers to how logistics could greatly reduce the work of retail operations. Being on time on a specific date would lessen the job of restocking of other goods if many big trucks arrive on the same date, causing an overload of tasks requiring more workers to process the jobs. Being logistically on time doesn't only mean that the day can be changed. The time can also be changed, if there are enough employees for the specific time. For example, perhaps the box of dietary supplements should arrive only at 6:00 a.m. Wednesday morning, when the store opens to customers in the morning. Or if the retail store is located inside a department store, boxes of dietary supplements should arrive when the department store opens. Scheduling of goods between retailers and logistic providers should be set to ease business operations for the retailers as well as the logistic operators. However, in this case, dietary supplements might be sent through the dietary supplement manufacturer's own logistic system, or by a third-party logistic provider from whom the government sector had purchased logistic services. The examination of optimized synchronization of manufacturer's logistics and retail stocking could clarify how businesses operate year-round, synchronizing with work-time, seasonal weather forecasts, political forecasts, and holidays. If there is political instability within metropolitan areas due to some economic reasons, businesses need to be aware of this situation and be sure their logistic systems and routes are clear. Workers' strikes aren't likely to be a problem in this country, since culture and traditions are different from other countries. Also, the unemployment rate in the country is higher when there are economic instabilities and political instabilities. The world economy also plays an important role in how the economy changes in the country, because many foreign companies make investments in the country, similar to India. When more people speak English, they are able to communicate with foreigners in other countries, and information transfer speed is upgraded every year by ever-changing IT and the global Internet. This enables long distance communication to be cheaper, and lowers business costs. Education seems to have an important role here. No business people seemed to regard education as a disruption, until many multinational corporations routed their business operations and call centers to India, instead of hiring people in the United States. If the U.S. government corrects this business behavior, then Americans could enjoy a lowered unemployment rate. To optimize

logistics and retailer stocking, boxes of goods must arrive at the appropriate time for the retailer business employees to do their jobs effectively. Cramming of the arrival of goods on the same day may cause other parts of the operation to slow down, if there aren't enough employees on that day, perhaps due to other reasons such as layoffs or sick days. So, the logistic operation and the retailer stocking operation must be examined thoroughly as to their schedules, operation planning, and operation management. The importance of optimizing risk and disruptions prevention in product delivery is similar to what was mentioned above about disruptions such as logistics, holidays, and street blocks. Disruptions that must be prevented can often be forecast earlier by examining geographic areas. Also, radio and television stations that broadcast information about traffic jams should also be taken into account regarding logistic problems. This would lessen the problems caused from not being on-time. Traffic jams in metropolitan areas can be very severe during the day before national holidays, mornings and evenings when parents have to deliver and pick up children at school, and during the rainy season. Also, the way how goods are delivered should be considered, for example some logistics have air-conditioned systems; this is good and in compliance with pharmaceutical delivery. However, some logistics that deliver food supplements are not regulated, so there is a third-party gap within the logistic system. Also, if the third-party system isn't air-conditioned, it is not a closed system. Air and moisture may get inside the compartment and cause damage to boxes and labels on the boxes. If not handled carefully when the goods reach the retail stocking area, wet boxes may alter customer satisfaction. At this point, we can use questionnaires to examine thoroughly for optimization and the derived mixed method results would give insights to how the businesses are performing.

### **CONCEPTUAL FRAMEWORK**

As a simple example, in a specific store, the retailer can consider ways to get things to shelf effectively for the consumer to “grab-and-go”, especially quickly consumed products in a grocery store setting. On a country-wide scale, though, where there is competition, and the economy rules who wins the competition,



synchronization in franchises, retailers, groceries and distributors differs from just storage and shelving. True synchronization on a large scale takes account of the entire situation: the population, the state of the economy, how much money people have in their pockets, and the shelf-life of products. Synchronization addresses all these factors. Managers and work employees must come together to overcome problems, such as an epidemic that reduces the number of product users in the population. Franchise retailers must be aware where their customers shop. If customers of one store are dying, then product must be relocated to another franchise store for other customers to purchase. Pro-active thinking is required. If returning goods to a central warehouse would be a waste of time, so interactions between franchises can be made to minimize shipment costs. If someone can be aware of and take action on the business visibility in the organization, this can save a tremendous amount of money

In pure science, chemistry and biochemistry have really vast backgrounds of information that have been developed for thousands of years. Biochemistry is crucial for laying a basic foundation of knowledge for today's health science professional. Many plant extracts have been researched, and were deemed beneficial for human well-being in the past. Some extracts are used as a single agent, and some extracts are used in combination with others, to enhance each other's function. Nowadays, some herbal extracts are being used as alternative medicines to cure illnesses. For instance, andrographolides that have antiviral properties are used as remedies for the common cold.

Up to the present, there hasn't been much study on retail supply chain synchronization that involved multiple retail outlets coordinating with manufacturers to increase resilience of business. In Thailand there are also private chains that have their own pharmaceutical manufacturing to suffice their supply chain. Study of synchronization could benefit both governmental retail operations and privately operated chains, in the future. There hasn't been much study on synchronization in retail pharmacy operations and management that have their own manufacturing services to fulfill their needs in sale and supply chain resilience.

Studies in retail pharmacies were involved mostly in marketing strategy, as a study by Wattanathum and Fuangchan, (2021). Their studies were involved in domains of marketing, and applied technology was involved in the study to achieve

the purpose of a competitive strategic management. Another was a study on service innovations that were involved with marketing performance, with many techniques for analysis involving manufacturers' innovations and marketing performance that were visible within retail pharmacies. (Kerdpitak, Aunyawong, Yen, & Chantranon, 2022). Another study in retail pharmacy involved customer satisfaction in Boot's retail pharmacies. The study examined dimension of qualities that affect customer's satisfaction in Boot's retail. The study was also compared to the SERVQUAL model, in dimension analysis. (Shi & Methavasarakh, 2020).

In addition to research studies involved in retail pharmacy, there was also the need for more research in the fields of customer behavior, retail management, manufacturing, and synchronization. Thus, this thesis to analyse retail management that has consumer synchronization as to their use of long-term products. Also, the study design involved would bring more dimension to the SERVQUAL model, similar to the WHO model that was largely referred to in medical research of many consumers behavior.

### **Utilization of Information Technology Innovation in Synchronization**

In this research, the author wishes to discuss only dietary supplement products that can be observed and used in conjunction with the IT system for dietary supplement adherence. The system will be synchronized in conjunction with sales promotion programs of retailers. This IT adherence approach would benefit product marketing where some consumers continue to use products only when advertisements continue. This type of consumer can cause business disruption in terms of advertisement information bias. They only use products that are viewed as trendy, if purchased and used. There are many aspects to adherence and its ability to persist throughout time, and to bring individual benefits in regional economics, and as a unified entity, countrywide. As a practical matter, adherence is like ringing a bell on the outside of a health service provider, announcing that attention is needed. Adherence is also crucial when it comes to regional economics, because patients' adherence to medications decreases the rate of hospitalization and lessens or minimizes risks of other underlying disease in progression. This would result in more

money in people's pockets for other expenditures in the regional economy. One study of adherence and regional variation found out that adherence comes from the quality of service provide at local healthcare giver. (Gibson et al, 2011) When regional healthcare givers are performing their jobs well, there is no variation in spending upon medical intervention. This is similar to the findings of Zhang et al, (2010) There are variations of dietary supplements and their functions. Drawing on the benefits of certain supplements may result in a reduction risk for hospital stays and for future hospitalization because of some important chronic diseases. Adherence is one of the key factors of good regional economics, when the health factor of the population is one of the concerns. Rosen, Spaulding, Greenberg, Palmer, and Neumann (2009) pointed out a study performed by Philips and colleagues that found out that persistent long-term use of the beta blockers class of drugs in the post-myocardial infarction population confirms benefits to health and finances of both individuals and the economic region as a whole. In conjunction with the study just mentioned, Clark and colleagues (2000) also did a parallel study of how one chronic disease alone can lead to another chronic disease, if taken a class of drug persistently can decrease risks of another development and thus causes huge savings for the province and cut down healthcare expenditures by half of the former expenses. Also, in terms of economic study, there are different types of chronic conditions, and many factors that can be key barriers to adherence should be considered, one of which is age. This is because adolescents do not have enough salary to pay the expense. (Ssewamala et al, 2019)

### **Adherence Behavior & Dimensions involved**

There are many dimensions to making adherence successful. It can be achieved from success in personnel-customer communication, from success in product promotion, and from other crucial factors. In this thesis, analyses of 4 core dimensions are introduced into the research. They are price efficacy, product knowledge, sales promotion, and customer satisfaction. Analysis of these four core dimensions shows some important factors that drive adherence.

Adherence (in this case to a prescribed medicine) is a multi-dimensional

subject. There are also risks, and other factors involved in a person's reasoning regarding adherence or nonadherence. Kalogianni (2011), mentioned that according to World Health Organization (WHO), adherence has 5 multidimensional sides to be discussed. They are (1) social support, (2) health care provider support, (3) health condition related, (4) regimen-related, and (5) patient self-care related. These five factors needed to be in congruence in order to enable adherence. For example, if health conditions in (3) have side effects that causes drowsiness, then social support from (1) must be available for adherence to happen. The two factors need to be in congruence (they need to support each other). Social support (1) doesn't only apply to driving the patient to an appointment, but elderly whose movement is limited must be able to obtain more complete social support, such as living with a family with an adult who can take care of the elderly, and so on. There has been further extensive research by Koop, M.D. that further investigated other major factors in addition to the five factors mentioned by the WHO. The investigation looked outward to factors including but not limited to race, gender, and socioeconomic factors. (Koop, 2005)

Mohiuddin (2019) further looked into (1) correcting current poor adherence, (2) involvement of the psychosocial factor, (3) distance from available healthcare sources, (4) other regimen-related dimensions (e.g., toxicities, interactions, polypharmacy), to further confirmed investigations done by Koop, M.D. This is in agreement with Chia (2008), who suggests persistent routine management for chronic patients. Mohiuddin (2019) also emphasized certain types of protocol such as the Administration Timing Simplification Protocol (ATSP) to be effective in managing adherence in cardiovascular patients. Empowerment, Motivation, And Medical Adherence (EMMA) raised adherence to a high point in 60% of the sample population. This shows the importance of development of multiple dimensions participating in adherence research, to complete the whole solution to the problem of patient-related non-adherence.

The systematic review by Viswanathan et al (2012) on the effect on adherence from the cost of medication seems to show review results similar with the research led by Mamaghani, Hasanpoor, Maghsoodi, and Soleimani (2019). In myocardial infarction patients who have been released from the hospital, means of

communication also has an impact on adherence. McGuire (2014), reported that in adherence and healthcare costs review that counseling patients with full coverage of knowledge can increase adherence by small increments of up to 6% of sample population.

### **1<sup>st</sup> Key Factor: Cost-Adherence and Socioeconomic Factors**

Considering product pricing, a retailer should multiple factors involved within an economic region. Not only flourishing economic figures should be taken into account; other socioeconomic factors should be also be discussed as key indicators for correct product pricing. One of the important factors to be concerned with is the socioeconomic factor. For instance, when numbers of non-smokers and sportsman are increased, overall healthiness of an economic region increases, and the number of people getting sick also decreases. This leads to more money in the pockets of people within the region. (de Boer, Dekker, Koning, Navis, and Mierau 2019)

The socioeconomic factor (or simply called “lifestyle factor”) is one of the considerably important factors to be acknowledged. However, there are other barriers to a consumer’s adherence to a product. Dietary supplements are similar to modern pharmaceuticals. Some pharmaceuticals have barriers to adherence, such as side effects, forgetting with no one to remind, fear of adverse reactions, and polypharmacy. (Mamaghani, Hasanpoor, Maghsoodi, & Soleimani 2019) The same group of researchers pointed out that cost and accessibility to healthcare givers are two important factors to nonadherence, according to patients’ self-report. Also, lesser barrier appeared to be from more education level. A further analysis of the reason why, would be that the adverse reactions are non-life threatening.

### **2<sup>nd</sup> Key Factor: Satisfaction on Base Price of Retail Products**

Pricing is an important factor in purchasing products. In normal retail product pricing, if the price too is high, the product might not get consumers’ attention. Drugs that are newly entering the market that are protected by a certain patent might be higher priced and inaccessible to patients whom insurers or the national health system

might not cover. Research in the Middle East and North Africa suggests that original drugs are high priced and non-accessible by many people. (Kanavos et al, 2020) Dietary supplements that are newly entering the market also tend to be high priced and inaccessible to some people. There are price levels that need to be justified when the same product enters different segments of the market. This means that if a product is used for more than one condition for different purposes, pricing needs to be justified to make customers willing to buy. Market segmentation analysis is one of the key indicators of successful advertisement and marketing. Right pricing can draw customer in from many directions, depending on marketing channels. (Carew, Florkowski, & Meng 2017)

Also, pricing needs to be examined to clarify the numbers of potential customers that would purchase the product. The same product with different uses would increase in market segments; with pricing examination, different customers would view the price difference and compare it to their needs. Pricing at the initial product launch should also take profit into account too; this would suffice the growth of business, retailer and manufacturer.

Pricing is considered one of the important things for initiation of a brand. For dietary consumption, if pricing is right and promotional pricing is right, it would secure future sales of the product. Customer satisfaction also follows if pricing is right. This would prevent competition with the retailer's brand if the national brand is priced right for the product to stay in market. A study showed that customers' satisfaction towards a retailer's brand is best when its price is around 30% less. (Zain & Saidu 2015)

In economic importance, pricing is a long road of marketability study, one must forecast marketable price per se for as long as roughly 30 years, if they are aware of economic effects on switching costs. This is important, because customers tend to switch to other brands when they lack money resources. An example would be gasoline costs, to reach for any available product when people forget to buy when they should have. This can cause brand shift from one brand to another in an instant.



This is in line with studies done on reputation and retail locations. Stores can survive when they are near their customers who support the store's product because of the store's reputation. (Xhema, Metin, & Groumpos 2018) Image is very important when it comes to continued customer loyalty in purchasing products or support services. The research group mentioned that product quality as well as pricing can reinforce a corporate image that is important to customer loyalty.

One study noticed the fruition of adherence, in chronic medical conditions. This can reduce overall hospitalization costs that may follow some day because of the patient being left untreated. A study in 4 chronic diseases, diabetes, hypertension, hypercholesterolemia, and chronic heart failure found that adherence to medication can minimize risks that lead to hospitalizing patients if left untreated or not adhering to medication. (Sokol, McGuigan, Verbrugge, & Epstein 2005)

Several research papers have mentioned the significance of costs to patient adherence. One Canadian study found that lower wage citizens tend to not adhere to their regimen of medications, because there was not enough money. (Law, Cheng, Dhalla, Heard, & Morgan 2012) A study led by a group of researchers (Gupta et al, 2018) clarified that the reason there was less money in pockets for medical expense to conform to adherence was that there was already a financial burden from disease.

The above-mentioned have shown the importance of adherence to benefit regional economics, and that can affect national economics as a whole. Many researchers have emphasized the consultation with healthcare givers; however, many have not emphasized regarding time available for listening to healthcare givers. An adherence review by Desai, Mahajan, Sewlikar, and Pillai (2014) has emphasized the importance of web-based technologies to reinforce adherence. This includes social networks, online forums, blogs, podcasts, and video broadcasts such as YouTube. There was also other research showing that efficacy of pharmaceuticals depends on adherence even if the medication is non-generic. This seems to be successful when conditions are treated successfully from medication usage. (Broder et al, 2019)



From above cost-related research items, we can derive that the retail cost of products must be examined thoroughly by prior investigation including other matters, to lead to possible synchronization of supply chain management and to leveraging profitability.

There is also other separate research that investigates adherence by studying the refill patterns of patients within a region. The study was done in Halland, Sweden by Galozy and Nowaczyk (2020). Another study concentrated on polypharmacy, and emphasized that for adherence, concern over medicine is also important, besides concern over cost. That is, patients tend to have difficulties managing their regimen; too many pills taken at different times of the day. This causes forgetfulness when there is more than one specialist on more than one chronic disease. There are also people who have doubts of the need for therapy. Also, there is one factor where there are side effects present; this causes patients to be wary of that, should they continue taking the medicine at some point of time during the day. So, the researcher came to the conclusion that daily management of pills taken must be taken into consideration. There should be some sort of strategies to create adherence in patients. (Gomes et al, 2019) Another study that concentrates on timing of refills suggests that a 90-day refill schedule is better for adherence than a 30-day refill schedule. This suggests that cost savings from more pills purchased at a time can reduce cost-related poor adherence. (Taitel, Fensterheim, Kirkham, Sekula, & Duncan 2012)

Among researchers that emphasized daily medication, apart from Gomes and colleagues (2019), there were also Jimmy and Jose (2011), who emphasized simplification of patient collaborative prescribing, communications used, and assessments of follow-up schedules. This investigates patient knowledge and promotes adherence at the same time.

Non-adherence due to poverty is a concern; there was one study that suggested a change in the government Medicare system. This was two-year research completed by Mojtabai and Olfson (2003) for state legislation.

In a healthcare giver setting, there are pharmacist and health employees who are available to give information. In order to overcome adherence reluctance, the pharmacist is the main person responsible for the roles of consultation and giving information. There are many factors involved in successful adherence. A review by Inamdar, Kulkarni, Karajgi, Manvi, Ganachari, and Kumar (2013) suggest the use of techniques in communication, assessment of knowledge when available, and counseling, over missed items that patients should remember. This would create a successful management of polypharmacy in chronic diseases, solely or combined. The factors described are similar to that of Ascertaining Barriers to Compliance, or ABC taxonomy, for short. It looked at patient behavior at the time of treatment initiation, treatment implementation, and during the continuum of the treatment process. To simplify this, it takes a look whether or not the patient begins taking a drug, at the first stage. The second stage checks whether the patient takes extra doses correctly for the regimen to control disease conditions. The third stage checks to see if the patient continues to take the dosage of drugs correctly and continuously. (Menditto et al, 2020) Together with the ABC taxonomy, the WHO 5 Factor model is used to study adherence by patients, dosage-related. The review founded that certain novel technologies can improve adherence and acceptability of dosage forms required by patients in whom low adherence may persist.

There were studies on adherence and IT systems. Mobile systems and electronic devices are popularly used among young people and working-class people. However, regarding people of geriatric age, one study shows that non-adherence in geriatrics exists regardless of gender. (Arbuckle et al, 2019) This study was completed primarily on the interest of patients taking drugs correctly, and it wasn't concerned with inventory management of drugs within the healthcare giver sites. So, space remains for development of frameworks to close gaps between patient care and business operations.

### **3<sup>rd</sup> Key Factor: Knowledge and Perceptions of Consumer**

Following the cost-related issue that affects adherence, there comes the

knowledge-related issue. The effect of knowledge on adherence doesn't apply only to drugs, it can also affect adherence to routines, procedures, and treatment steps. Much medical field research looked into adherence to participating in medical procedures also. There are a few examples such as adherence to positive airway pressure therapy, led by Willard-Grace, Wolf, Hwang, Lewis, and Su (2020) that found adherence in these procedures requires a lot of coaching, and sometimes the conditions similar to sleep apnea is hard to manage. A more intensive study on medical procedures that affect the survival rate of patients can be found, regarding adherence to guidelines among cardiac arrest patients. (Hessulf et al, 2020) A more intensive study on medical procedures that affect the survival rate of patients can be found, regarding adherence to guidelines among cardiac arrest patients. (Hessulf et al, 2020) The term "knowledge" doesn't only apply to knowing educationally about the drugs taken, but can also refer to awareness, perception, and behavior that a patient has towards the drugs. Fukuda, Ando, and Saito (2020) studied knowledge and adherence, inquiring whether risk awareness and driving behavior is a good indicator of medical adherence. Patients avoid taking the medicine when they have to drive, but take it at a later time when they are safe. This means that they aren't forgetting to take the medicine, but are taking it as their physician directed. This also helps prevent risks from accidents in traffic to their destinations. There are many ways that knowledge works its magic. One antibiotic adherence research found that people who knew that they were infected wished to be healed from the disease, so they adhered to the regimen, in hopes that they would be cured. These findings also show that their knowledge of the disease and drug is improved, and they become more persistent in taking the drugs. This gives good a clinical outcome and prevents antimicrobial resistance. (Hashim et al, 2018) In ADIEHTA Group, a randomized trial on antihypertensive drugs also found that the rate of adherence increases after an increase in knowledge. (Guirado, Ribera, Heurgo, & Borrás, 2010)

Perception is an important matter in product usage, it is of very broad use. Perception regarding healthcare products depends on many aspects of the product itself. There are many dimensions to perception of a product, such as its quality, its use, its potency in promoting health, and effectiveness. One study on perception looked into synthesizing perception barriers that prevent patients from adhering to

drugs. If patients feel that the drug feels like a placebo when they take it, this may cause them to stop adhering to the drug in the future. (Lycett et al, 2018) If patients taking pharmaceutical drugs that act to preventing asthma from attacking feel normal, they may feel they are taking a placebo. The feeling of being normal can sometimes lead patients into thinking they are normal and healed, so they don't need to take medicines. If no healthcare providers talk to them about the mechanisms of how the drug works, the patient may become non-adherent. When dietary supplement pilot studies have not been done yet, perception is one of the criteria that proves useful in extracting patients' knowledge and thoughts on the dietary supplement being used.

When starting use of a product one is to adhere to, understanding the factors involved in preliminary steps is crucial to the adherence itself. If studying patients' perception, a conversation is a good initial step to adherence. A Japanese study in 2017 by Orimo et. al, included perceived severity, benefits, and susceptibility into the knowledge data collected. These data are then used to examine how to initiate therapy, together with looking at the current therapy regimen, and looking backward at frequency of hospital visits. Furthermore, the researchers commented on transparent proactive communication to make patients less worried about their medications in order to improve adherence. Therefore, it can be inferred that perception plays an important role in extracting key points on what to talk about with the patient in the future.

There are several papers discussing adherence to medications during certain types of chronic diseases. Each group of chronic diseases tends to have similar outcomes regarding adherence to medications. Chronic diseases have diverse backgrounds, such as infections, psycho-emotional, physical, exposures, etc. One paper found an outcome similar to the antimicrobial adherence study mentioned earlier. The assessment of knowledge of antiviral drugs and a study of adherence found that when patients are educated, they don't forget to take medicines at all. They only forget when they leave a drug bottle at home or if they take the drug at a later time when people don't see them taking it. (Adje, Williams, Bezugbe, & Dangiwa 2020) Apart from chronic infectious disease and psycho-emotional states, there was

one research study regarding emotional distress that found that low adherence in lipid lowering drugs tend to form within the first two years of post-myocardial infarction. (Lissaker, Wallert, Held, & Olsson 2017) Similar research in preliminary studies of psycho-emotional states found the lower adherence to be associated with the impact of psycho-emotional states during the abrupt time period of being in grief, feeling stigma, and suffering loss.

It can be summarized that in a state-wide study, there seems to be problems with healthcare givers educating patients. One study in hypertension found that patients who still have low knowledge still do not know the benefit of hypertension drugs and long-term complications that might follow. (Alzahrani et al, 2019) If there is more knowledge in this area, adherence to the drug may increase. The findings are quite similar to assessment research on knowledge and adherence completed in a Saudi hospital clinic. The researchers found that the healthcare giver lacked a good structural understanding of what knowledge should be transferred to patients. (Shilbayeh et al, 2017) The findings are quite similar to assessment research on knowledge and adherence completed in a Saudi hospital clinic. The researchers found that the healthcare giver lacked a good structural understanding of what knowledge should be transferred to patients. (Shilbayeh et al, 2017) If the problem persists, the healthcare giver should reassess communication to the patients to ensure they understand.

Chronic disease that concerns pressure and aggregation of blood tends to have similar concerns. Chronic disease that concerns pressure and aggregation of blood tends to have similar concerns. There were studies that assessed knowledge and therapy-related items. Farsad, Dastan, Salamzadeh, Moghadamnia, Eskandari, and Fahimi (2018) did an educational pamphlet study on knowledge and adherence to blood thinner drugs, and found that low levels of health literacy also leads to non-adherence. This means that diet also must be controled, besides taking the drug correctly. Another study on diet adherence also found importance in a hemodialysis adherence study. (Hashemi et al. (2015) The research suggest that patients should have more diet counseling and education. This study confirms the importance of

similar findings that knowledge of right diet can increase antihypertensive drug efficacy and compliance in long term management of hypertension, thus reducing complications that may arise from not correcting hypertension. (Khodaveisi, Fakhrazizi, Mohammadi, & Tapak 2019)

Research by Jankowska-Polanska, Uchmanowicz, Dudek, and Mazur (2016) also pointed out that knowledge about drug and diet is important. If patients have more knowledge and perception insights into their disease, they tend to conform to the treatment regimen better. The research also suggests that those who have low knowledge about their disease also have low knowledge of diet, and later comes low adherence to antihypertensive drugs. Similar findings by da Silva Barreto, Reiners, and Marcon (2014) that found non-adherence is associated with little knowledge about disease, and that often patients receive combinations of medicines that are hard to manage. Healthcare givers sometimes give little or insufficient attention and counseling to patients. The study completed in Brazil was similar to the Saudi Arabian research, and confirms non-adherence due to insufficient attention from healthcare givers. Healthcare givers tended to give insufficient consultation and also didn't reassess patients regarding their understanding about drugs and disease.

A broad range of studies about knowledge and adherence also look further into certain types of drugs and their dosing intervals. One drug may have more advantage than another for people with limited knowledge. For people who are more naive, certain drugs can more easily be adhered to than others, and lead to a good clinical outcome. (Giner-Soriano et al, 2020)

Research in knowledge and adherence of diabetic patients shows that knowledge correlates with improved adherence, improved blood sugar level control, and lowers other related disease complications. (Mandpe, Pandit, Dawane, & Patel 2014) The above-mentioned related disease complications is very broad concern for all healthcare givers and state legislatures who make health policies. Diabetes can lead to other chronic diseases such as chronic kidney failure, if blood sugar is not



controlled properly. Similarly, cardiometabolic diseases also receive wide attention regarding adherence to medicine. Many physicians emphasize researching knowledge and adherence, to improve clinical outcomes. Many physicians emphasize researching knowledge and adherence, to improve clinical outcomes. The review by Ferdinand et. al. (2017) mentioned a sentinel program that enhances patient knowledge and lets them learn about risks and benefits, and consequences of not following physician guidelines for patients. Furthermore, the sentinel program also educates physicians on how to communicate with patients, so they will be better informed by the physician.

The review by Ferdinand et. al. (2017) mentioned a sentinel program that enhances patient knowledge and lets them learn about risks and benefits, and consequences of not following physician guidelines for patients. There was one question regarding a cough as a symptom of chronic respiratory disease. Sometimes, if the question is too short, it can cause misunderstanding by the patient, this might suggest tool-related insufficiencies when it comes to patients' cognition capabilities. If the group of researchers were more elaborate on giving more definition and understanding to the questions asked, the answers might be different.

In terms of adherence and knowledge, there are also types of non-adherence called "white coat adherence". White coat adherence is when patients tend to adhere to therapy at the beginning of therapy, and prior to seeing a doctor on the next visit. This receives a lot of attention because it can lead to false medical interpretations by physicians. (Zueger et al, 2020) White coat adherence matter is very important when it comes to medicines. Many drugs that we use today come from natural sources rather than synthetics in a laboratory. For example, a cholesterol blockbusting drug that is used to prevent cardiovascular disease comes from a natural source. Drugs have many kinds of mechanisms when acting on particular regions of the body. In botanical sourcing of leading pharmaceutical compounds, if a compound suggests decreased risk of a certain chronic disease, it will eventually enter pre-clinical trial research, and then on to clinical trials, that eventually lead to use in humans. If research trial clinicians are not aware of adherence, then some drugs may not be discovered beforehand, or might not be discovered at all.

*Herbal extracts are the same even though they are consumed by humans in*



*good health, over time, uses leading to other health benefits are not necessarily found. Therefore, this can result in some pre-conclusion that may lead researchers in the future to similar findings regarding longevity of the Japanese, as in Okinawa research.*

If a person takes a herb every day and doesn't get kidney stones, but other people in the same region do get kidney stones, a scientist might discover that the herb is what is preventing the formation of kidney stones. This can lead to a new finding. This is the type of white coat adherence that we are talking about. If a person takes the herb only with white coat adherence, then he might get gallbladder stones like other people in the region. So, to say this is important. This is because white coat adherence occurs during the time range when there might be little or no concentration of active ingredients from herbal usage to prevent kidney stones.

Simply put, health systems providing education, satisfying patient feedback, and increasing knowledge in return as patients report their insufficiencies, would improve medical adherence. (Ferreira & Castleberry, 2019)

Besides research looking into psychometric states, like that of WHO's 5-factor and General Surgeon Koop's research, there has also been research that looked into patients' central criteria. Research has come out showing that patients' thinking controlling how well they are able to take care of themselves is one of the criteria that governs adherence. Some people are the type that when the mind thinks, the body follows. These people are aware of their thoughts and situations in everyday life. Each morning, they know what they will do during the day and how will they take their drugs. The smallest things are included in their planner for their everyday life and in their weekly calendar.

One research had findings along the same line, that people who are active decision makers and who make decisions every day in their life and seem to have success in adherence. (Al-Hajje et al, 2015) These researchers found that patient success is the first criteria for successful adherence. Healthcare givers are just supporters as they give out calendars and reminders to take the drug. Similar findings

are found throughout patient-centric research that aims at making patients successful people first, and then adherence to medications will follow. These patients feel they “professional” drug takers, after they’ve been through an educational course with the physician, and never-ending consultation with a pharmacist. This means that in patient-centric adherence, what the healthcare giver does is to encourage patients to be active planners and doers.

Knowledge assessments for drug adherence for many types of chronic disease have satisfied the basic need to incorporate knowledge as one of the factors for retail operation in order to succeed with customers. White coat adherence would also be included in the study, if certain products require intervening questions towards the customer.

When the healthcare giver and the patient are making plans together in a patient-centric scheme, relationships are created that pave ways for loyalties: brand loyalty and customer loyalty. In a retail service management environment, the operations of retail clerks are similar to any retail service business. Organizational variables in terms of marketing management play a vital role in making customer satisfied. This satisfaction then makes the customer feel good and return for customer service. Satisfaction hence changes customer behavior and how they act toward retail service providers. (Awan, Siddiquei, Jabbar, Abrar, & Baig 2015) Also, prior loyalty comes from good customer service. Good customer service leads to satisfaction, and when it is in continuum it leads to retention of customers. Why would customers go somewhere else, if they have a good service already located? Retention of customers leads to more opportunities to make profits, by introducing more services and more products to them. (Chopra, 2014)

#### **4<sup>th</sup> Key Factor: Promotion of Product Sales**

Regarding satisfaction, there are reviews on customer responses and feedback, such as research by Milner and Furnham (2017). Broadly, the review provides scale for research and their uses. It can be used directly or improvised to fit criteria being

sought to clarify problems.

There have been studies of offers of a lot of gift vouchers and promotions that ended up with no influence upon customer loyalty and satisfaction. (Zakaria et al, 2013) This shows that loyalty programs don't necessarily create customer loyalty. This suggests that in order to create satisfaction in customers, one must understand customer experience management. Several papers have discussed the importance of customer experience. There were three that focused on retail management: Naylor et al. (2008), Grewal et al. (2009), and Verhoef et al. (2009). Grewal et al. and Verhoef et al. were only conceptual; only Naylor et al. went to quantitative MANOVA analysis. Andajani (2015) found that customer experience is built through three factors, physical stimulation, sensory stimulation, and rational thinking, which create memorable emotions, and hence, lead to satisfaction. A prominent work of research from England showed that use of the SERVQUAL method leads to better understanding of consumer need's and leads to better decisions in service, in order to obtain customer satisfaction. This leads to adjustment of management procedures and obtaining better outcomes with customer satisfaction. This research studied which section of service operations of the hotel brings the most income into the hotel. The research found that of all hotel operations, it's not room rental that brings the most income into the hotel, but rather food and beverages and the pleasant service that the hotel has to offer. This brings in local guests for enjoyable service, so the hotel doesn't have to rely only on guests from out of town. (Saadeh, 2019)

#### **5<sup>th</sup> Key Factor: Counseling and Education**

One research paper found that improved patient-caregiver relationships improve adherence of patients to their treatment regimen. (Riekert et al, 2014) It is important to for patients to keep their care regimen in mind. They must listen and follow in order to live longer with some diseases, and with some diseases, they must conform to the treatment regimen to survive at all.

Although the severities of chronic diseases are not the same for all individuals affected, the longer time spent with patients, the more importance is brought to their

minds. When longer time is spent on each patient, relationships are built automatically. People may hear something, but they are more likely to follow what they heard when a relationship is built. The same context is similar with healthcare givers in retail and hospital settings. In a retail setting, when any dietary product is introduced to patients, employees must be able to educate on how to use the product properly and remind the customer consistently, so that a long-term relationship is built. When a long-term relationship is built, trust will be formed. This is the basis of all customer loyalty when it comes to managing a healthcare business.

In terms of being economical to purchase (cheap to buy), there are also areas where an economical price and sales promotion encourage patients to adhere to products. When purchased continuously, customer loyalty may be created from the fact that they got used to using the brand and enjoying the benefits of good health. Long-term use may induce the perception that other brands may not work, especially if the patient is fully educated of the amount of extracts used and if the way they are extracted is different from another competitive brand.

As well as price perception, sales promotion is also important. There was an elaborate study of relationships between manufacturers and retailers in managing product sales and product life cycles. Retailers' and manufacturers' roles tend to be different in business organization settings. In a non-synchronized state, manufacturers perform manufacturing, and push products to retailers through trade shows, sales force, and promotional pricing. They also do the work of advertisement through various media, making marketing plans, providing consumer samples, and promotional wholesale pricing. On the retailers' part, they do the work of customer vouchers, loyalty programs, advertising, price-cuts, and retail promotions. The review of the normal framework of many businesses today has already been mentioned. Communication and promotional strategy by retail managers and vendors alone can boost profits to a desirable state. (Ailawadi, Beauchamp, Donthu, Gauri, & Shankar, 2009)

From this point, it can be suggested that (1) effective sales promotion enables

customer loyalty for retailers and brand loyalty for the manufacturer, (2) effective promotional strategies on wholesaling by manufacturers can be worked out, (3) effective sales promotion techniques can be examined by retailers. In the downstream it can be suggested (1) how successful sales promotion affects retail operations, (2) how employees' efficiencies can increase due to business operations, and (3) how manufacturers can increase production efficiency to meet increased market demand.

There are many types of products being sold within the country. Some are just general products; however, there are some that marketers called "hit and niche" products. This type of product enters the market and stays as long as forever. In terms of dietary supplements, there may be dozens of longitudinal studies of some herbs, and then suddenly comes a potent extract for dietary use. There was a large-scale study on consumer packed goods by Hoskins (2020). Hit and niche are products that are already have wide consumers' attention, such as laundry detergents, dishwashing liquids, and everyday consumables. The study concluded that such products would be deemed successful if a wide distribution of a product would follow its advertisement. This means that a product's success would depend on wide distribution among wholesalers and retailers after it has been advertised on television, before and after, and in-between TV dramas, etc. Certain dietary supplements with potential for wide use can be situated where the niche is, such as locales that have a high mental exhaustion rate, manufacturing sites, healthcare giver sites with a high concentration of patients with neurological disease, neuro-deficit healthcare centers, large hospitals that have a brain disorder unit, and drug stores situated in a city region that may have a lot of old people having trouble with neurological disorders.

#### **6<sup>th</sup> Key Factor: Benefits of Product**

Benefits are one of the important factors when it comes to customer selection of what product to use. Adhering to usage is another matter, but benefits and adherence both fall into the same category of what makes people use the product. One example would be a pregnant mother taking an iron supplement during pregnancy to benefit the health of mother and child. The pregnant mother may not know which to

choose, but the physician can recommend one for her, for the benefit of healthy mother and healthy baby. The perceived benefits are the key driver of adherence, and family support further strengthens continued adherence. (Triharini et al, 2018)

Besides providing a sought-after benefit, a retail purchase can be looked at as a customer journey. When a customer enters a store, next there will be a communication between the customer and an employee. The customer is a participator in a one-to-one communication, and the retailer's employee can lead the customer. This can be seen as customer journey management. (Grewal & Roggeveen, 2020) In this type of journey, understanding, emotional response, and behavioral response are all involved. Whatever retailers have for sale within their retail site, the creation of a retail atmosphere together with merchandise quality and pleasant service can provide a enjoyable journey for the customer. Enjoyable as a part of retail communication success, and enjoyable because of health benefits.

Another benefits and adherence study can be found regarding repetitive dietary intake, such as the Mediterranean diet. There is a study on the diet and newly occurring cancer cases. There are so many dietician reviews linking the Mediterranean diet to a reduction in cancer risk. However, the researchers found that no correlation between the Mediterranean diet and reduction in cancer risk. (Schulpen & van den Brandt, 2020)

One study on perceived benefits found that consumer behavior can be altered to conform to good health, such as in the qualitative study of pharmaceutical reminders. The research found that when reminders are successful, patients benefit from gaining confidence in self-management of drug use. Their behavior changes to a confirmed adherence and a healthy life

Besides people who use drugs as part of their treatment, there are also people who don't respond to drugs and who tend to find other ways to alleviate illnesses, such as traditional herbs or other herbs. Chinese people tend to use Chinese medicinal



herbs, rather than Indian ayurvedic preferences like Thai locals. These people can be regarded as self-referred to whatever healthcare giver can provide sufficient treatment for them. These types of people tend to adhere to treatment regimen better than usual outpatient in a healthcare giver organization. (Arndt, Rubel, Berger, & Lutz 2020) These types of people tend to adhere to treatment regimen better than usual outpatient in a healthcare giver organization. (Arndt, Rubel, Berger, & Lutz, 2020) Whenever the administration of dietary supplements does help in the long term, manufacturers can benefit from forecasting how many pills should be created for the segment of these self-referred consumers who seek additional alleviation therapies.

By managing information and tailoring it to consumers, a retail business can enjoy profitable sales and consumers can still enjoy the fruitful benefits of dietary supplements. When adherence is being managed and consumers are benefiting, retailers can adjust their marketing goals to benefit consumers and benefit the retail business itself. By promoting adherence to its customers, a retail business can build warm knowledge management, customer relationship values, and certain business information that can shape how the retail business is valued. Information such as sales growth can be forecast to inform the manufacturer's procurement of raw materials for future production.

### **RETAIL SUPPLY CHAIN SYNCHRONIZATION**

Retail accounting of fast consumables and purchased products was completed by POS systems and other enterprise management suites. There have been studies such as predictive and adaptive management in omnichannel retailing supply chains; however, the framework was still in simulations. (Pereira, de Oliveira, Santos, & Frazzon, 2018) The studies have found that the simulations could provide more predictive and accurate details to deal with uncertainties in sales volumes and supply-demand incompatibility. This means that the simulations could forecast how much product to store when there is an uneven demand curve. This raises further need to



administer more practical and easier web development in terms of retail management and adherence. It would be simple on the web to figure the numbers of supplements used daily multiplied by how many people per day. This could calculate out the numbers used per month e.g., ten million per month, and information provided could be used for further planning of business operations and manufacturing operations.

Retail management is not a simple subject. Economics is what drives sales and makes customers buy promotions. People buy things during promotions because they can get more items for the same price, or the things that they use are cheaper. People buy things during promotions because they can get more items for the same price, or the things that they use are cheaper. However, after the subprime mortgage crisis in the early 2000s, many retailers suffered from a low growth rate, sales plummeted, as customers weren't loyal anymore and tended to shift towards other products and services where they could keep more money in their pockets. There was a decline in customer retention, which if not quickly corrected, can lead to disaster. About a decade later, came a new thinking in the retail sector called "customer empowerment", which seemed to work quite well in retail store sales performance. (Mishra & Vishvas, 2016) Being customer-centered can drive success in sales, although, the reason for success in this case may have been an economy that was recovering from the subprime crisis.

There are differences in cultures, and economics do come into play in certain dimensions. There has been research that shows that changing prices that changes numbers of loyal and satisfied customers. The finding was that customers who are highly satisfied don't mind cost, but medium-level satisfied customers do mind cost. (Ting, 2014) So, healthcare providers have to realize that changing prices can affect customer numbers, both right away, and in the near future. This concept is in the category of retail operation management and marketing, to keep customers at an optimal number, and to increase numbers when economies are flourishing throughout the region.

Intercultural competence in retail service is another factor that drives success in retailing. In metropolitan areas, there are diverse cultures present, due to worldwide

collaboration in political management. For example, the United Nations is an organization that hires employee to work in Thailand. More and more multinational organizations like this situated and operating within metropolitan areas create a diversity of cultures. Dealing with foreign customers creates unique challenges for retail clerks. To gain competency in serving foreign customers, the retail clerk needs to have an understanding of what is needed. Improving employees' education and training in serving foreign customers can also increase competency. This type of activity helps avoid the need for service recovery in the future. (Ihtiyar, Ahmad, & Baroto, 2013)

### **Retail Supply Chain Synchronization Management**

The use of an IT system to increase adherence can also increase customer relationships to a retail outlet. It creates a connection, a type of bond with the retailer. When use of IT becomes a part of their lives, this creates a relationship with and a need for service from the retailer. Similar to the ideation of patronage mixing with retail marketing, this is where a retail place builds an environment that urges customers to come and shop often like it is part of their life. The shopping place becomes almost a second home to them; they come to pick up things like it is a part of their family. (Blut, Teller, & Floh, 2018) In terms of using web-based services to increase adherence, there are also profits from this service, in that customer relationships also increase the value of retail business. When there is such a relationship, it is easier to sell other products to customers who are looking for their needs. The use of web-based adherence elsewhere can be used to manage retail store employees, when a customer comes in for a sales promotion, or on schedule to repurchase products. Retail managers can have schedules for employees to fill-in their week days of work, and keep records of which employee maximizes profits from which customer, etc. Findings in this thesis would digress with Kim and Richarme (Kim & Richarme, 2009), that service operations efficacy increases profit gains.

Nowadays, data from consumers is sensitive, and it is crucial that retailers keep it private. Private data that contains a customer's sensitive information must be

protected. This is a concern for many stakeholders within business entities that share profit from customers. (Martin et al, 2020) If data contains customers' sensitive and private information, it must be handled with care. This creates confidence in customers when they are communicating with retail employees.

The use of innovative technology such as information technology can provide in-depth information that can be used to enhance the functioning of supply chain management. The information from purchases in Omni-channel retail supply chains can be used to predict and forecast purchases. (Pereira & Frazzon, 2019) Although, the research seemed to be informative and collaborative on the retailer's part, if it were in a synchronized state, it would provide much detail that would be able to help solve problems on the manufacturer's part. If there's a very high demand for certain products, the manufacturer can meet the demand in time, through a synchronizing supply chain model. This means that when demand suddenly jumps high, it can be possible to solve the problem within the brink of time. This can be seen during Christmas time, when demand for some types of goods jumps very high.

This type of sudden jump in demand is generally seasonal, and has a limited duration. This very much concerns countries that have increased volume of purchase during festivals, celebrations, and national holidays. Many simulations that work on promotional time-sensitivity supply chain management are abrupt, following the administration of POS systems in retail stores. (Fang & Yuan, 2019) It's been quite a long time after the change from analog systems to digital. Two decades of time have been a great period for researching digital innovation.

In the digital age, customers using innovative web-based tools can impart information on customer experience to the retailer. Also, this would increase customers' trust of the retailer, when it comes to customer care that leads to customer loyalty. For example, customers can more easily find solutions that they need.

In terms of synchronizing the supply chain in retail supply chain management,

one should take economic factors into account in arriving on how many of which types of good would sell. Besides economic factors, the retailer would have to include sales promotions and marketing activities from manufacturers into their retail operation plans. Within a synchronized state, everything should be faster than collaboration, or normal supply chain management. One would see normal supply chain management in products that are wholesale from the manufacturer. However, within a synchronized state, one would see that the type of products would fall into the category of fast consumable goods. When there is synchronization, everyone in the retail and manufacturing sectors is doing things together at the same time, to achieve a balance of supply-demand and prevent shortages of products in the market. In managing the supply chain, everything must be planned, and it must be possible to achieve what is planned. Information exchanged in between retailers and manufacturers must be transparent, in order to achieve a level of trust and to enable synchronization to run smoothly.

When collaborating on running tasks of supply chain management, transparency makes the system more dynamic and flexible. This means that information arrives every day on the calendar, so that decisions can be made simultaneously, or planned over time. (Vallandingham, Yu, Sharma, Strandhagen, & Strandhagen, 2018)

Moreover, supply chain synchronization can be integrated into strategic partnerships, when food chain supplies are to be delivered in a time-sensitive manner. Synchronization can enhance prior research, and strategic sharing of information can be used to bring better judgment upon the business matters regarding supply chain forecasting. (Eksoz, Mansouri, Bourlakis, & Onkal, 2019) This enables strategic partnerships and trust and collaboration. There has been extensive research in group forecasting, to enhance the prediction of what types of products should be delivered to fulfill market demands. Furthermore, it can be used in conjunction with other modern technology, such as block-chain traceability that is currently being studied with supply chain traceability. This type of research receives attention in supply chains that are involved with food and pharmaceuticals. (Casino, Kanakaris, Dasaklis, Moschuris, &

Rachaniotis, 2019) Another paper discusses how block-chain technologies increase trust between partnerships, and overall increase the traceability of products in logistics. (Behnke & Janssen, 2020)

There has been research on the use of anonymous shoppers to test employee efficiency within a retailer's operation, concluding that it is unreliable for making predictions on customer satisfaction and sales performance. This research found that anonymous shoppers can't replace or predict behavior of real customers. (Blessing & Natter, 2019) So, within the context of supply chain synchronization, the use of anonymous shoppers should be excluded for evaluating consumer adherence, when examining the efficiencies of retail operations.

When operations are in synchronized, there are risk factors to be discussed in supply chain management. Risks that are prominent and hard to avoid must be discussed, as well as other minimal risks that are avoidable with preparation. Some of these risks can be shared through information sharing, cooperative decision making, and collaboration with knowledge from both business organizations. After sharing, many risks can be avoided to help guarantee successful business operations.(Badea, Prosteau, Goncalves, & Allaoui, 2014) There have been similar studies on time-based supply chain performance that found that management of time-based supplies ensures long-term profitability of businesses. (Acar & Uzunlar, 2014) This means that time-based criteria is not applied only to food and other time sensitive products such as supplements and pharmaceuticals, but is also applied to other various products that need to be delivered on time.

Supply chain synchronization has evolved for nearly two decades in American business schools. Other parts of the world may vary. Currently, there are new concepts derived from dealing with problems that need to be eliminated from business operations. A study by Salmela, Happonen, and Huiskonen (2012), discusses the visibility of supply and demand, and finds that sharing information is important when it is used throughout synchronization. This means that its data is visible to all the

people who are working together. It is important when a business organization faces uncertainty in customer demand or market demand, that it manages risks when synchronizing business operations.

Future findings of this dissertation would maximize understanding of how organizations behave regarding retailing and manufacturing when they are practicing synchronization. Further research would explore new information that is useful for future business operations in retailing and manufacturing. This may clarify difficulties that may exist within an organization and also it may work out difficulties found in research by Kembro, Naslund, and Olhager (2017), such as difficulties in exchanged information regarding demand forecast, available supply forecast, accurate information, must be on-time information, and other groups of information that may be related.

## **RETAILER'S PROFITABILITIES FROM SYNCHRONIZATION**

### **Customer Long-term Partnership**

As discussed earlier, customer loyalty can be affected by are ups and downs within the economy. Indirect profits gained through customer care also can improve the customer's experience, through the use of innovative digital routes. In some regions, one cannot be sure of loyalty in a business setting, such as regions where there are a lot of people moving in and out of the region due to employee strikes, or a lot of employees quitting their jobs, or due to whatever reasons. This can be seen in industrial zones and economic zones that have experienced lessened expenditures in purchasing goods and services. So, we can only hope that customer care can create long-term partnerships through creating good customer experiences.

### **Risk & Pandemic Disruptions**

Risks in business operation are discussed earlier, in the part about supply chain management. One unexpected event that happened recently was the spread of the SARS COVID-19 virus, and measures to fight it, causing pandemic disruptions in businesses. This was an economic disaster for retailers, due to less people going out of



their houses, forcing many department stores and retail stores to completely shut down.

The total effect of COVID-19 pandemic disruptions on business operations and on resilience has not been fully determined. There has not been a lot of data synthesized from research papers. The earliest research available had to do with simulation of risks and preparedness. These simulations of real-world business operation data told that organizations must be prepared at some level for disruptions to occur. Data from simulations is similar to real-world data in the subjects of manufacturing operations and logistics. Results of data simulations can help executives at the decision-making level to come up with informed solutions (Ivanov, 2020)

Research derived from Twitter data by Sharma, Adhikary, and Borah (2020), showed that the disruptions caused by COVID-19 alone presented difficulties in managing supply chains, and had profound negative effects on business resilienceness. The pandemic disaster affected so many businesses, that there was a need for rebuilding business strategies for resilience. COVID-19 was a shock to all businesses in operation, though certainly the effect of the pandemic shock was lessened for businesses that were in a synchronized mode. Other factors may have contributed, such as employees leaving their jobs, which might have worsened problems already present in operation management. Picking up knowledge and crucial operation points was hard to come by, because these must be built by experience. The economic factor may have played an important role in causing these employees to go in and out of jobs, hence, making businesses more prone to collapse through certain types of disruptions, including COVID-19.

## **MANUFACTURING SUPPLY CHAIN SYNCHRONIZATION**

There are certainly a lot of businesses operating in the healthcare sector today, including pharmaceutical businesses and food science businesses. Since the beginning

of modern pharmacy in the early 1920s, most of pharmaceutical businesses have borrowed technologies from food science. This was the early era of tablet making machines, first with single punch, and later with rotary systems with two or more stations. Nowadays, there are rotary systems with over sixty stations. Also, capsule filling machines are advanced to the point of automated operation, with less human interaction. Later on, some pharmaceuticals have required semi-solid carriers for the enhancement of stability and delivery.

In collaboration work within synchronized supply chains, we would look at information from the retailer, from this we can from the web-based system how many pills are used per day, and calculate how many pills will be used during the month. Meanwhile, the number of customers may increase through word of mouth, and an estimate of this number can be added to the calculation of how many pills should be made to meet the requirements per quarter. The web-based pills-used numbers can be used to approximate retail stock replenishment forecasts, manufacturer production forecasts, raw material supply orders forecasts, and other operations within two business organizations; the retailer and manufacturer. The baseline performance of manufacturers can be tested for further optimization, as found in a paper by Oliveira, Taki, Sousa, and Salimi (2019), who presented many types of indexes for performance evaluation seeking Overall Equipment Effectiveness in a manufacturing environment.

In managing synchronization between retailers and manufacturers, most information goes through IT systems and communications within systems. The IT system should be analyzed similarly to manufacturing equipment systems. This would benefit the knowledge-management portion of retail and manufacturer organizations. Although, some misunderstandings of IT service should be clarified, machines do the job of processing and storing. The objectives should be clear on inputs, where information goes, where it is stored, and how it is retrieved. (Wan, Zhang, & Wan, 2011) So, when synchronized, this ends up providing information where it is needed by two organizations. Computers can handle large amounts of data and perform artificial intelligence that replaces human labor. In the modern age, retail employees

are enabled to use computerized systems to serve customers better. Also, some types of service may be personalized through the use of these intelligent machines. (Harting, Reichstein, Laemmle, & Sprengel, 2019) Another study summarized that when there is a positive relationship in pleasantness of employees when serving with motivation, this can create a wonderful emotion in customers. (Tyrvaainen, Karjaluoto, & Saarijarvi, 2020) This in turn can create customer loyalty. This is in agreement with earlier works on customer service that perception has a profound effect on customers' emotional experience.

Besides the importance of visibility comes the monitoring of information. This is important to stakeholders of an organization. If information is not fragmented into levels of importance, it is just a bunch of data that is hard to use or take into account. There was research on monitoring bits of information that found the importance of sorting them into subjects and rating them for relative importance. Also, some unimportant subjects may be discarded. The researcher has analyzed the effects of this sorting, and found that it brings advantage to an organization. Evaluating subjects constantly and verifying them results in having more specific information at hand when working with other workers in management. (Gualandris, Klassen, Vachon, & Kalchschmidt, 2015) This is important within the framework of sustainable management of supply chains and manufacturing of products themselves. Visibility and constant monitoring give precise acknowledgement of how products are obtained from outside sources and processed within the manufacturing site. If the processes are hidden, this may cause risks and disruptions while manufacturing the products. For example, when manufacturers have two or more suppliers for raw materials, the products have virtually the same ingredients, but the way they are extracted may be different. Evaluation of whether raw materials are compatible with other raw materials requires visibility, in order to compare and contrast the raw materials. This gives rise to the need to further research in terms of management of the manufacturer, and other important subjects upon this matter.

Besides the manufacturer's supplier management, relationships between personnel are also important. There was a study on IT integration of relationship-making within manufacturers and supplier's organizations. They also studied other

variables. They found that this building of relationships improves suppliers' and manufacturers' performance at the same time. Things get done more quickly when people of two organizations become closer to one another through the IT communication framework. (Connor, Lowry, and Treiblmaier, 2020) It is also important to investigate further into other realms, in terms of perceptions of what can increase a manufacturer's performance through procurement of supplies from a supplier. Other things must also be investigated within the realms of manufacturing performance.

When things are multistage, Usage of IT solutions can bring improvements to activities; however, they can also bring barriers and compatibility issues later. (Shao, Liu, Li, Chaudhry, & Yue 2021) Besides using IT solutions, an awareness of cyber security risks must also be taken into account. (Boiko, Shendryk, & Boiko, 2018) One study stated that customer satisfaction also increases with marketing performance when there's an application of information technology involved. (Tseng, Wu, & Nguyen, 2011)

There are two kinds of performance to be assessed: financial performance and non-financial performance. (Inaam, Abderrahman, & Yasmina, 2016) Criteria involved can further be segregated into dimensions to think and collaborate about for assessment. The group had proposed a framework of thinking divided into 5 categories: collaborative discussion, sharing information, agreeable goals, making decisions together, and sharing resources available at hand. In operating firms, it is crucial for people to share information with each other, because in the real world when everybody performs, it always involves money. Money goes into running business, money to and from banks and financing are unavoidable, because the economy has its up and downs. By understanding the importance of finance on business, one can see how the firm's performance is one of the factors that bank needs to see. Performance is one of the factors to be assessed by bank managers for business loans.

Research in supply chain management can enable managers to examine their

technologies and evaluate their effectiveness. This causes managers to think of how they will evolve their management in the future for the betterment of retailing. New strategies can pave ways for operation efficiency, and innovative management would maximize profits in the future. A study shows how investment in technology can be used to maximize business strategies that can reduce some human work. (Plangger, Montecchi, Danatzi, Etter, & Clement, 2020) For example, tacit knowledge within Knowledge Management of an organization, one can use video-recording and playback to reduce the use of human for some area of training.

There are also studies into innovative technologies to improve visibility of data and supply chain management through monitoring. (Huabgm Kanitgem, & Benaben, 2017) The development of these technologies implied that visibility is very important when handling data between collaborating organizations.

There have been studies on different types of collaboration of operation management. These were baseline studies on supply chain collaboration in Norway. They found that collaboration is a very important factor when it comes to innovation of new products. Companies developing scientific solutions can offer very good products or services, but if suppliers of raw materials for the products are still lagging behind, there would be a flaw in the process in the future. So, collaboration is a good thing, but there are certain points that managers must be aware of when they are innovating products. (Haus-Reve, Fitjar, & Rodrigues-Pose, 2019)

There was a study by Kang and Hwang (2017), that measures factors within an organization for supply chain management. The study found that planning and making decisions together is very important in collaboration. It creates a mutual understanding of fundamental processes in operations and also creates trust within firms.

Similarly, in the realm of synchronizing with a retailer's operations, there are needs to be assessed for the baseline evaluation within two organizations. After baseline evaluations are complete, further assessments can be performed to see if

there is any efficacy and performance increase within management operations. One study in Greece reveals that information sharing between two firms in the supply chain can increase overall performances in supply chain management. It increases reliability of information when exchanged throughout the operational process, and quality of information is also increased when firms collaborate on information and ideas. (Marinagi, Trivellas, & Reklitis, 2015) Another study of information sharing in strategic management showed that sharing information in a supply chain can increase supply chain performance. (Kocoglu, Imamoglu, Ince, & Keskin, 2011) The research looks into expenses relating to utilization, use of assets within firms, reliability of supply chain partners, flexibility seen in the supply chain, and responsiveness seen in supply chain partners. The researchers found that information sharing can increase the correctness of informational data when it goes along with collaboration. From this point, firms should be using corrected information to improve their performance in managing the supply chain.

Building partnerships in the supply chain is an important task. Organizations must have a shared vision for the future and must maintain that vision by making decisions and improvements together in order to gain trust and sustainable outcomes. (Halil, Mohammed, Mahbub, & Shukur, 2016) There are certain problems and barriers involved in building sustainable operations in managing the supply chain. (Alzawawi, 2014) There are internal and external barriers to the success of sustainable management. The internal problems can be separated into cost barriers, knowledge barriers, and IT integration barriers. External problems are related to certification and to governmental regulations on business operations.

Besides the above, there's also an awareness within industry operations, such as traceability of supply chains that goes deeper into a product's quality and characteristics. This is where the good side of product qualities, the down side of toxicities, and important matters are further discussed in terms of being traceable. (Germani, Mandolini, Marconi, Marilungo, & Papetti, 2015) It is important where environment sustainability also becomes an important concept for green businesses. Besides pharmaceuticals, products like emerging vaccines also receive attention, so



raw materials must be traceable. (Jarrett, Yang, & Pagliusi, 2020)

Synchronization of manufacturers with retailers can provide information that can be used to plan the numbers of production needed within a certain amount of time. (Schuh, Prote, Luckert, Hunnekes, & Schmidhuber, 2019) This helps eliminate manufacturing failures when products are needed to be delivered on time for store shelf stocking or for warehouse stocking.

### **Manufacturer's Logistics**

There have been studies on a centralized logistic network to evaluate informational flows within the realms of logistics. It also resulted in minimizing CO<sub>2</sub> emissions, that helps win the “environmentally friendly” title and also makes it possible to transport more goods in one fleet. (Shammsuzzoha, Ndzibah, & Kettunen, 2020) Research like this creates supply chain sustainability and environmental friendliness that is good for the environment.

Apart from the above-mentioned research, if a logistical part of the manufacturing is evaluated, further improvement on its logistics can be attained. Furthermore, efficiency can be further assessed when the retailer's requirement is time-sensitive.

Apart from the above-mentioned research, if a logistical part of the manufacturing is evaluated, further improvement on its logistics can be attained. Furthermore, efficiency can be further assessed when the retailer's requirement is time-sensitive. If risk management is effectively designed, implemented, and worked out regarding possible risk scenarios, this can bring sustainability in the supply chain. (Ivanov & Dolgui, 2019) Moreover, Al-Husain and Khorramshahgol (2020) pointed out a supply chain has different stages of management, and each stage requires decisions that are meant to be made together. Making decisions together through stages creates responsiveness in employees and managers, thus enabling things to work out according to planned strategies. In terms of logistics, there are dynamic

strategies in supply management in the developing framework. (Masteika & Cepinskis, 2015) This helps firm circumstances to become adaptable to fast changing environments within a region. This makes the firm welcome to regional logistic services to enhance functions in terms of logistics. Although the concept has not been much clarified, there is viable concern that it would more become important in the near future. This will require elimination of strategic risks. The nearest scrutiny of problems that can be found in long distance logistics is the fact that over-use of tires can cause problems and accidents also, if a tire bursts. Tires that are worn out can also be slippery on the road during rainy season. All sorts of things come into risk considerations and checking points to eliminating accidents and being on-time with arrival of goods.

From the two research papers mentioned above, we can derive the importance of assessment of strategic plans within logistics. If products on the road from the warehouse don't arrive on time, it would push the manufacturer into the zone of service recovery.

Strategies on long-term logistics cost savings should also be discussed in parallel with green logistics. The investment in continuously usable containers can provide cost-saving for operations in the future. (Fan, Xu, Zou, & Bai, 2018) Further assessments can widen reasoning from manufacturers. There are problems to overcome in of green environmental practices. They can be expensive in the short term; however, cost reductions in operations can result and be beneficial in the long-term. This is in agreement with the assessment on sustainability of environmentally friendly logistics to enhance the business functions while reducing costs economically. (Tay, Rahman, Aziz, & Sidek, 2015)

There is a study on optimization of logistics, that found that it can improve the logistic process, reduce business costs, and increases logistic efficiency in delivering on-time. (Peceny, Mesko, Kampf, & Gasparik, 2020) This study calculated annual costs based on distances from city to city. However, in a metropolitan areas where traffic jams often cause delays, further discussion is needed on being on-time and

making new routes to destinations to save gasoline. Also, when retailers are particularly different from each other, managers' methods of solving that is another case to be assessed. For example, retailers that are in department store are different from stores operating 24 hours per day.

## **MANUFACTURERS' PROFITABILITY FROM SYNCHRONIZATION**

Synchronization in terms of the manufacturer's point of view is to create relationships with retailers and enable them to manufacture required goods on-time for market demand. Manufacturing synchronized with retail creates a successful industry that can deliver to meet market demand. (Heutmann & Schmitt, 2019) Two researchers pointed out that to lead to successful manufacturing, crucial factors must be sorted out and faulty points be closed in on early before they progress. This implies that personnel-related operations must have buffers, and machine operations must be checked thoroughly Internal disturbances and external disturbances must also be taken into consideration before manufacturing operations begin.

Further problems arising from the mentioned criteria need to be solved, as in an assessment on supply chain robustness. (Monostori, 2018) Taking two works of research into consideration, there are still more key points to be examined and further assessed in manufacturer's production systems and operatives' guidelines within their operative culture.

### **Retailer's Relationships**

Working with and synchronizing with retailers creates long-term partnerships. This creates more trust when working together, and reduces tensions that may be created from bargaining, sometimes seen in large-scale business wholesalers' manufacturers. (Matsui, 2020)

An increase in logistic performance of a retail manager can increase overall performance of the store, in terms of readiness of products to sell. (Ltifi & Gharbi,

2015) This finding by two researchers confirms earlier findings by McKenzie et. al, (2011). This may be found in store settings when retail stock is up to customers' expectations when they would like to purchase a lot. Although the level of happiness of customers was not discussed at the satisfactory point of evaluation of products purchased, retail store replenishment performance via manufacturer's logistics ensured that there were products ready to sell. This leads to a further need to assess logistic efficacy and performance within the realm of manufacturers' organized operations.

### **Trusted Partnership with New Retail Channels**

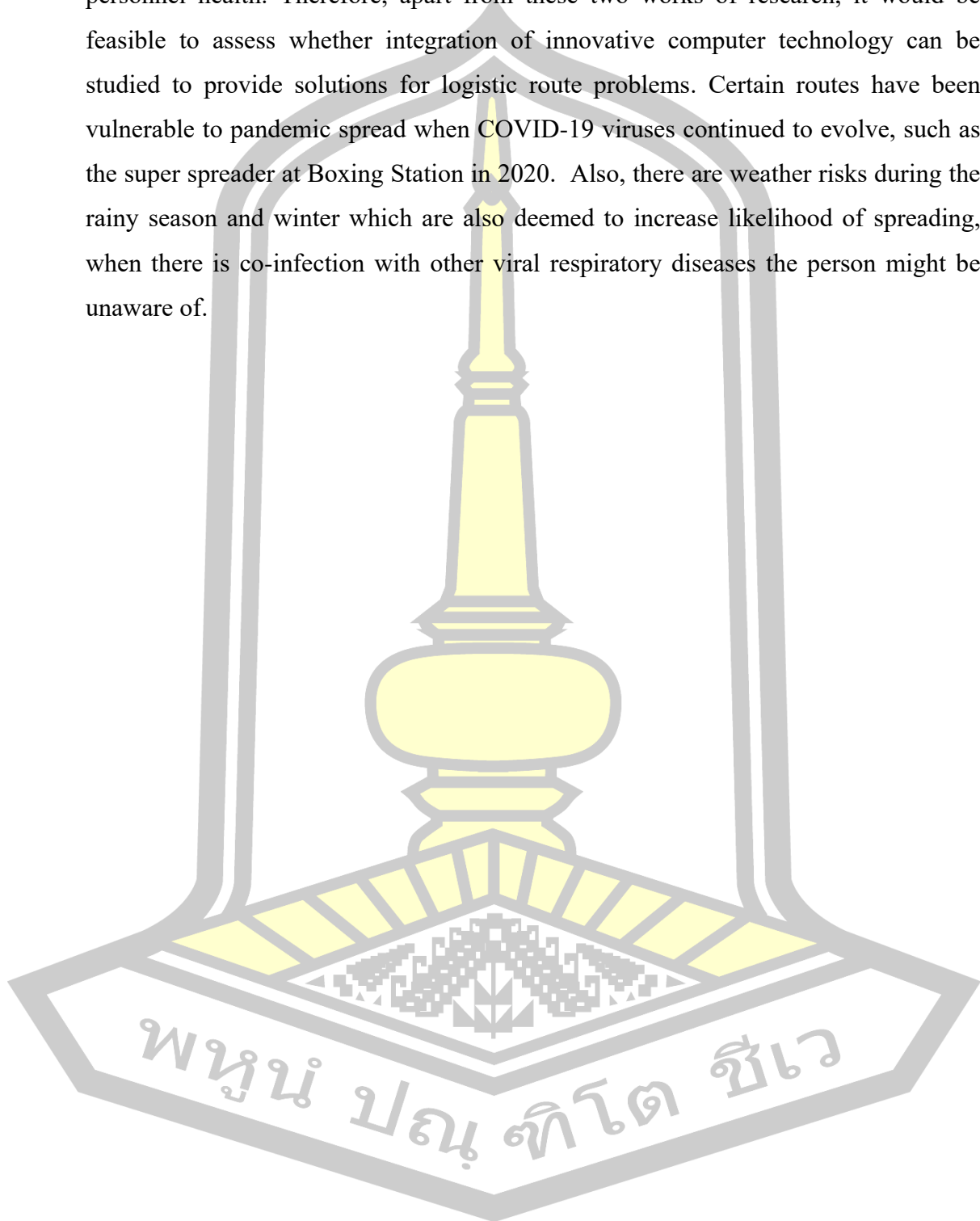
There is need for a further look into synchronization and its success with other retailers, how this allows for new retailers to become new customers. This allows for progression of the market and allows for product marketing to subsequently grow into maturity. This also prepares the marketing manager and production manager to work together; it creates mutual experiences of personnel, so an organization can endure.

### **Risk and Pandemic Disruptions**

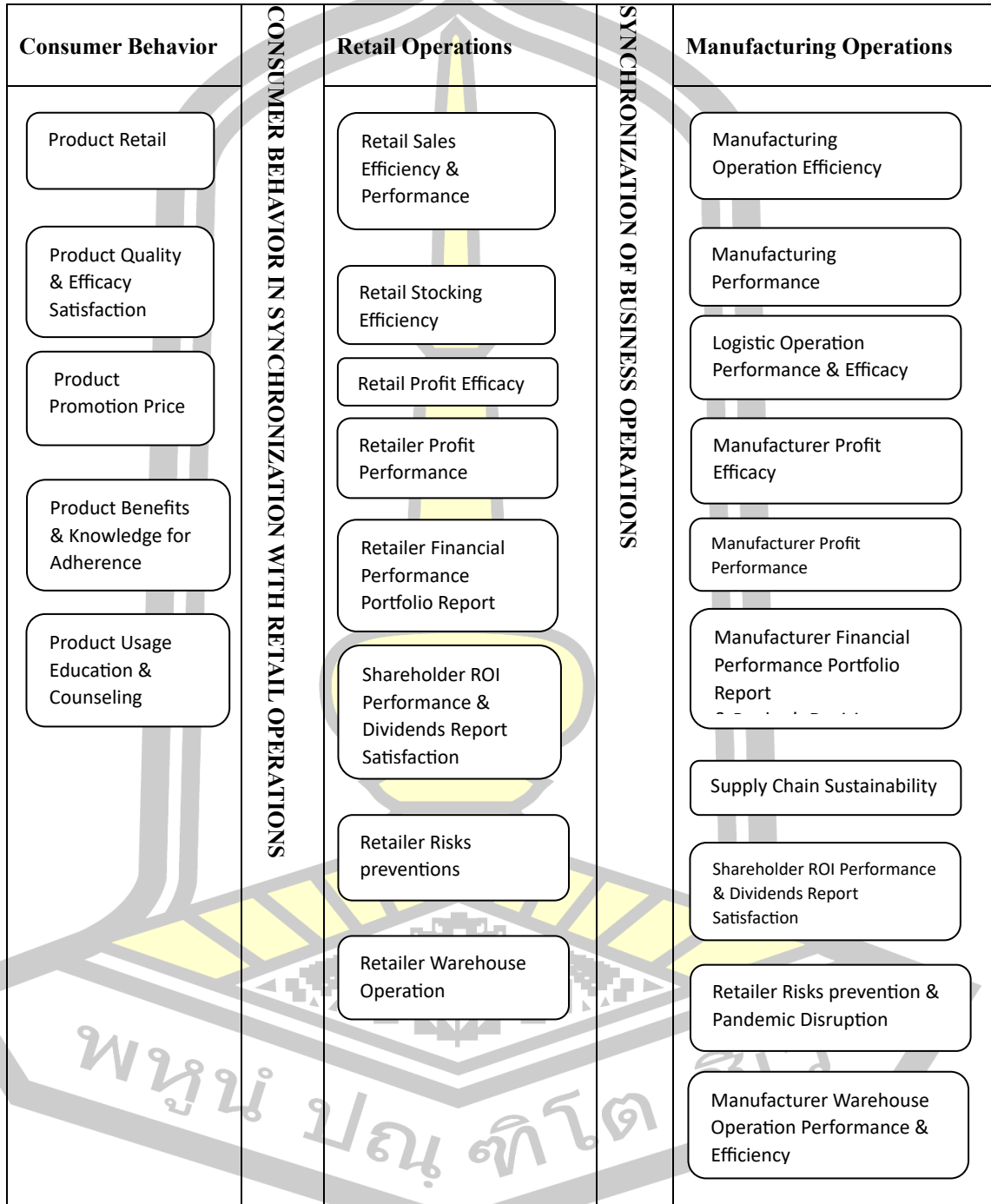
The benefits of synchronization will be discussed in certain areas such as logistics and availability of products. From studies within a manufacturer's operational process or managerial plan, readiness of the manufacturer can be evaluated. Risks and disruptions from future pandemics can be minimized.

There was much synchronization with local logistical services within regions. This method of synchronized logistics with local regional partners has proven to be successful in terms of cost-savings and operational success. (Souza, Goh, Lau, Ng, & Tan, 2014) This perspective of collaboration is quite new in the decade. In times of pandemic disruptions, further investigation on synchronization efficacy of logistics can be discussed. There were studies on logistic performances through minimizing fault actions that can hinder increases in key performances. (Schmidt, Maier, & Hartel, 2019) Systematic thinking was linked to outlining successful markets in the

future. There is still further need to avoid risks in pandemic disruption and in securing personnel health. Therefore, apart from these two works of research, it would be feasible to assess whether integration of innovative computer technology can be studied to provide solutions for logistic route problems. Certain routes have been vulnerable to pandemic spread when COVID-19 viruses continued to evolve, such as the super spreader at Boxing Station in 2020. Also, there are weather risks during the rainy season and winter which are also deemed to increase likelihood of spreading, when there is co-infection with other viral respiratory diseases the person might be unaware of.



**Fig. 1 Conceptual Model**





**Fig. 2 Variables used in Research Framework**

**Variable Group 1: Consumer Behavior and Retail Operations**

- 1.1 Pricing performance and Consumer adherence
- 1.2 Sales Efficiency and Consumer adherence
- 1.3 Retail stocking Efficiency and Consumer adherence
- 1.4 Consumer satisfaction and Consumer adherence
- 1.5 Sales promotion and Consumer adherence
- 1.6 Product knowledge and Consumer adherence
- 1.7 Consumer adherence and Retail Sales Performance
- 1.8 Retail Sales Performance and Retail Stocking Efficiency
- 1.9 Retail Sales Performance and Retail Profit Performance
- 1.10 Retail Sales Efficiency and Retail Profit Performance

**Variable Group 2: Retailer and Manufacturer Supply Chain Synchronization**

- 2.1 Retailer Stocking Efficiency and Efficient production strategy
- 2.2 Retailer Order Fulfillment and Efficient production operation
- 2.3 Retailer Stocking Efficiency and Efficient warehouse strategy
- 2.4 Retailer Stocking Efficiency and Efficient warehouse operation
- 2.5 Retailer Order Fulfillment and Efficient logistic strategy
- 2.6 Retailer Order Fulfillment and Efficient logistic operation
- 2.7 Retailer Order Fulfillment and Operation efficient budget expense
- 2.8 Manufacturer operation strategy and Efficient supply chain sustainability
- 2.9 Manufacturing Performance and profit performance
- 2.10 Manufacturing Efficiency and profit performance

## CHAPTER III

### RESEARCH METHODS

This research aims at inquiring possibilities of using digital innovation from IT sector, to test whether if maximizing profitability can ensue following the usage of IT innovations to manage consumers. Many innovations developed, not much attention was drawn to focus on using IT to help businesses handling consumers at the forefront of retail sales. Overall performance and efficiencies in retail and manufacturing sector is further examined to see if profit was maximized.

This research is intended to see whether if retail sales can be enhanced by customer adherence synchronization and benefiting retails and manufacturer, in terms of increasing profits.

One can see the whole big picture of how the real-world problem is solved with simplicity in mind on the retailer's part and how the manufacturer falls in-line with maximizing production and securing long term chain supply for the continuity of product in the market. Aforementioned was a visible systematic thinking ideas and order. The questionnaires that will be use would analyze current situation consist of two data sets. The first set would be exploring the organization culture, traditions, and conventional management. The second set would evaluate when optimized by synchronization. The two sets of surveyed data, first set would be evaluating for its efficacies and performances in pharmacy retailer, pharmacy distributors, and government pharmaceutical manufacturer. Second set would be evaluating healthcare consumers adherence and information visibility towards pharmacy retail and government manufacturer for synchronization with conventional system. Consumers are those particularly the consumer of the retailer that sells the product studied. The suitable product for this research is Bacopa Selext.

The sample population size was determined using Cohen's consumer behavior formula.

The whole research starts with building a web-based system for gathering data

from consumer in terms of their adherences. The web-based system consists of

1. User interface and database system where all input were stored and able to review in the web back-end system for pharmacy retail manager and government pharmaceutical manufacturer's managers.
2. The information from retailer regarding consumer behavior are synchronized with pharmacy retailer, pharmacy distributor, and government pharmaceutical manufacturer for assessments.
3. Efficiencies and performances in pharmacy retail operations and manufacturer's production and logistic were examined and evaluated. Before and after pharmacy retailers, pharmacy distributors, and manufacturer's operation synchronization were evaluated, compared, and contrast.
4. Profits leverage was examined at retail point and manufacturer's ability to save budget on all operations and increase production from continuous bargain of raw material purchases.

### Sample Population

1. Both gender male and female of age more than 40 years old to 85 years olds were include in the study.
  - 1.1 There were two papers indicates 40 years old or more clinical trials and mean age 65 years old in 70 patients in Thailand.
  - 1.2 Other papers at least overseas indicated at least 18 years old are safe for long term use. Even though EIC studies shows that old population age would decline roughly 7-8% but the benefits of dietary supplements don't fall into that of vitamins category, in fact it could benefit the elderly also.
2. Bacopa Selext supplement users were studied for Retail and Manufacturer Synchronization, through using consumer adherence tracking system on web.
  - 2.1 Bacopa Selext is a product from government pharmaceutical

organization.

2.2 It is currently new to market and were more effective than non-extracted Bacopa tablet and capsules.

2.3 Current economic situation in Thailand also may cause stresses in aging middle-aged workers and also the increase of geriatrics may increase the use of Bacopa supplement to help memory and learning problems.

2.4 Recent increases in Bacopa Selext have importance that supply chain must be study to prepare for disruption and product market booming.

3. Subjects must have internet access and able to use web browser to report usage of products.

3.1 Internet access must be in a continuous daily access for both mobile wireless internet service or Internet access from home.

3.2 Subject must be able to report usage of Bacopa extract through web user interface on a website or have family members do it for them if needed for the uneducated

3.2.1 Web browser must be able to comply with current SSL technology for protecting subject data.

4. The study completion time is within 6 months

4.1 It is able to cover 2 quartiles of business operation, this would enable to see the efficiency of web adherence tracking system.

4.1.1 Any increase in long term customer numbers can be seen and data can be use for synchronize all business operations in retailers involved and the government manufacturing.

4.1.2 Every month data was sufficient for statistics used in the study to evaluate efficiencies and performances in retail and manufacturing operations.

4.1.3 Length of time was sufficient to see a good profit amount that can be observed from budget savings, maximize raw materials purchase, and increase manufacturing to support number of increases Bacopa Selext user.

## 5. Kingdom of Thailand, a countrywide study.

### 5.1 Every region of Thailand was taken into account for the research.

5.1.1 Research questionnaires were sent to government pharmaceutical organization to conduct a retail and manufacturing operation research within the organization.

5.1.2 Questionnaires were sent to retailers and distributors that were involved with the government pharmaceutical organization.

5.1.2.1 Consumer questionnaires were sent to pharmacy retailer and distributors for subject enrollment and start usage of consumer adherence tracking.

5.1.2.2 Retail operation questionnaires were also sent to pharmacy retailer and distributor for the synchronization research study.

5.1.2.3 Enroll subjects and pharmacy retailer would give information on number of bacopa users distribution in each region of Thailand.

5.1.2.3.1 Data would be use for strategic purposes in pharmacy retailing, manufacturing, logistics, and supply chain that enable government pharmaceutical organization business to understand supplement market in a complete picture with innovative information technology for consumer use.

### Research Tool

#### 1. Consumer Adherence Tracking Web System and Consumer Adherence Multiple Choice Likert 5-Scale Questionnaire

1.1 Consumer Adherence Tracking Web System was developed for study of consumer adherence to food supplement products.

1.2 Web Interface user input was made to receive input of Bacopa Selext usage every day.

1.3 Every day input was report to Retailer and Manufacturing every day for operation visibility that can be use to adapt into conventional management system in pharmacy retail and government supplement manufacturing.

1.4 Questionnaires were developed to find consumer adherence in long term use.

1.5 Questionnaires also finds six important keys to long term adherence that affects retail operations.

## 2. Consumer Adherence Tracking Web System Usage Multiple Choice Likert 5-Scale Questionnaire and Consumer Adherence Interview

3.1 Questionnaires were developed to find conveniency in web tracking for supplement usage adherence

3.2 Questionnaires were also seeking customer advice for development of future system after consumer adherence tracking.

3.3 Interview questions were made to explore consumer thoughts and feelings that were related to supplement use with web adherence tracking use. Interview questions also seeks to explore self-explanation of future uses.

3.5 Interview questions also explore importance of web adherence and supplement uses towards customer after usage.

## 4. Pharmacy Retailer Operation & Synchronization Multiple Choice Likert 5-Scale Questionnaire and Interview with Synchronization Tracking Web System

4.1 Questionnaires were created to test hypothesis for retail channel, such as forecast sale, forecast order, and promotion planning that enables efficient retail. stocking.

4.2 Supply chain synchronization activities with manufacturer are examined and evaluate for its efficacy and performance

4.3 Retailer Operation & Synchronization Interview was used for thoughts and feelings towards usage of web synchronization system. Also, strategies and planning were also interviewed for web system that were use in synchronization with Bacopa Selext consumer and government manufacturer.

4.5 Interview questions also explore importance of web adherence and



supplement uses towards pharmacy retailer usage.

## 5. Pharmacy Government Pharmaceutical Manufacturer Operation Multiple Choice Likert 5-Scale Questionnaire & Interview with Synchronization Tracking Web System

5.1 Questionnaires were created to test hypothesis for manufacturing efficiencies and performance in production, market forecast for future sale, forecast future order fulfillment, and promotion planning that enables efficient retail sale and retail warehouse stocking for long term consumer adherence.

5.2 Supply chain synchronization activities of manufacturer and retailer were examined and evaluate for its efficacy and performance to withstand increase market demand and increase consumer in each region.

5.3 Manufacturer Operations & Synchronization Interview was used for thoughts and feelings towards usage of web synchronization system. Also, strategies and planning were also interviewed for web system that were use in synchronization with Bacopa Selext consumer and government manufacturer.

5.4 Interview questions also explore importance of web adherence and supplement uses towards government pharmaceutical manufacturer usage.

6. Questionnaires were gathered and form dependent variables and independent variables for testing hypotheses consist of 20 dependent variables and multiple independent variables to test hypotheses.

### **Research Data Collection**

1. Research Data were collected from Consumer, Pharmacy Retail, and Manufacturer. Data comes all regions in Thailand.

1.1 Consumer Questionnaires and Interviews were gathered from questionnaires involving supplement adherence and adherence tracking system. Consumer questionnaires were 5-Scale Likert. It is use to test hypothesis on consumer adherence that is use for visibility system in pharmacy retail operations and is synchronized with manufacturer's operations. Consumer interviews further examined self-explanatory qualities that can give more understanding of adherence.

1.2 Pharmacy Retail Questionnaires and Interviews were gathered from

participating pharmacy retail and pharmacy distributors across regions of Thailand. Questionnaires were 5-Scale Likert that examine Efficiencies and Performances of pharmacy retail operations. Interviews of Pharmacy Retail managers also further examined operation qualities that can give more understanding of consumer adherence towards pharmacy retail operations and its effect on retail synchronization with manufacturer.

1.3 Government Pharmaceutical Manufacturer Questionnaires and Interviews were also gathered from headquarter in Bangkok. Questionnaires were 5-Scale Likert that examine Efficiencies and Performances of manufacturing and logistics operations that meets pharmacy retail and increasing market demands. Interviews of government pharmaceutical manufacturer managers also were examined on manufacturing operation qualities and performances that can give more understanding in efficiencies of synchronization that enhances government pharmaceutical organization performances to meet increasing consumer.

## 2. Web System Synchronize Data Collection for Examine Profitability.

2.1 Data were involved with pharmacy locations that were scattered in all regions in Thailand. The pharmacies in each location would give data on their customer use. Result of consumer adherence each day would be conclude in a web system back end for managers to review. This can summarize primary profit from sales transaction. After synchronization, any budget saving, bargain raw material purchase, and manufacturing efficiencies that can increase product in market and efficiency of retailer to increase sale was also examined, then a secondary profit would be examined. Synchronized operations between pharmacy retail and government pharmaceutical manufacturer would be use for determine of outcome and hypotheses.

2.2 Synchronized consumer visibility data involved pharmacy retail operation and government manufacturer operation is further analyze using SPSS for data analysis.

The result data analysis is then translated into statistics that shows relationships between variables in hypotheses.

## **Research Data Analysis**

Data analysis in pharmacy retail operation seeks relationship between consumer adherence, consumer satisfaction, price performance, sale efficiency, retail stocking efficiency, sale promotion, product knowledge, and retail sale performance. It also seeks relationship between stocking efficiency and sales performance, sale performance and profit performance, and sale efficacy and profit performance.

Data analysis in manufacturer operation seeks relationship between retail stocking efficiency on production strategy, warehouse strategy, and warehouse operation. It also seeks retail order fulfillment on production operation, logistic strategy, logistic operation, and efficient budget expense. Furthermore, it seeks relationship between manufacturer's operation strategy and supply chain sustainability. Also, manufacturing performance and efficiency that affects profit performance.

Data collected through the web-based system were analyzed by R-Statistics for retail operations, which was done for pharmacy retail managers and manufacturer's managers then gathered data were used by retail managers to answer questionnaires that were related to retail operations and consumer adherence synchronizations. IBM Statistical Software SPSS were further used to analyze relationships between variables in hypotheses regarding consumer adherence, pharmacy retail operations, and manufacturer operations. The hypothesis variables' relationship is analyzed using multiple regression and multiple correlation.

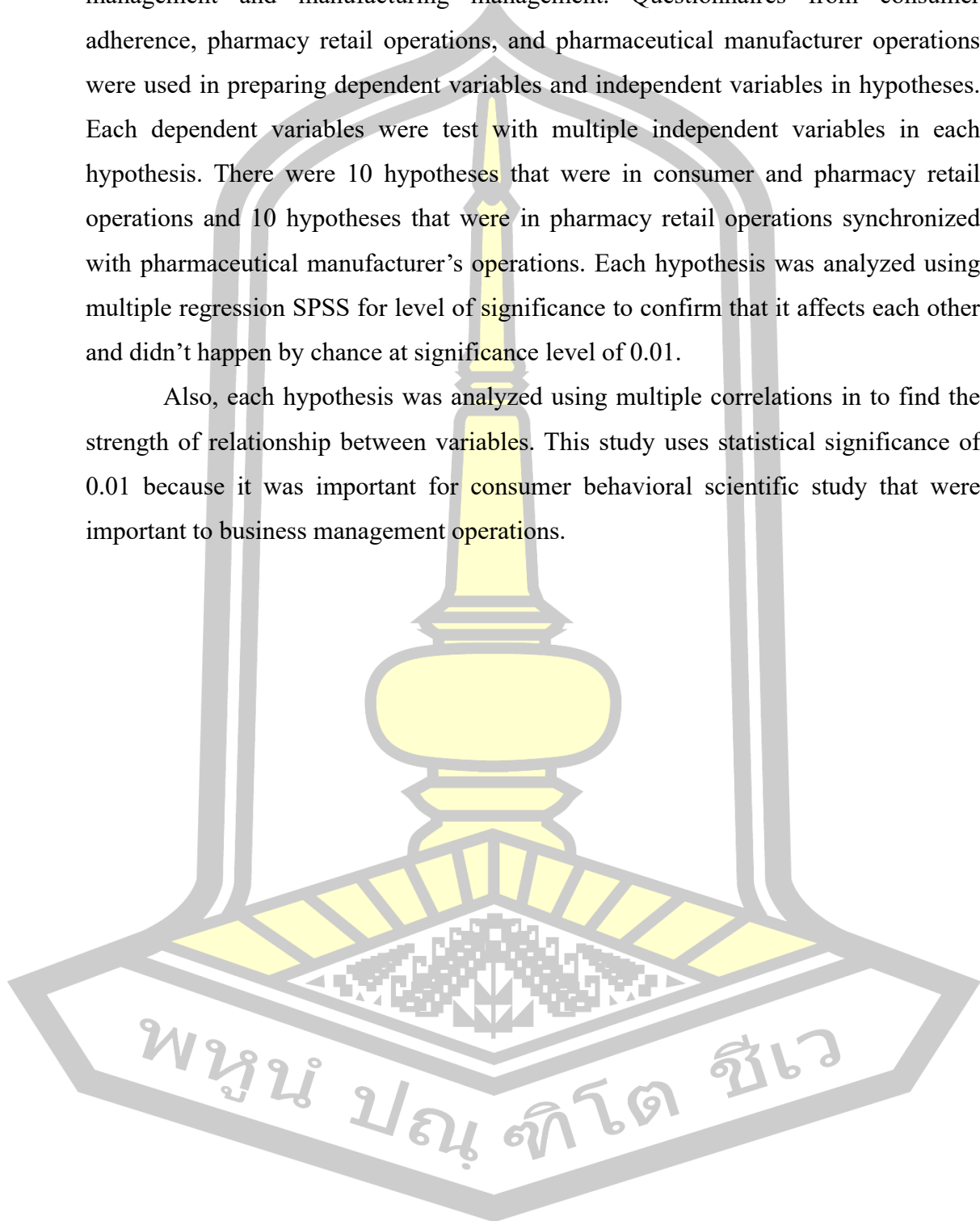
With Data Analysis, Statistical Package for Multiple Regression were used with 5-Scale Likert items that were from all questionnaires. The questionnaires involved 5-Scale Likert items were analyzed for consumer adherence, pharmacy retail operations, and government manufacturing synchronized operations compared with conventional operations. Furthermore, each variable was statistical analyzed by SPSS correlation statistical package.

## **Statistics for Research Data Analysis**

IBM Statistical Software SPSS was use in this research for data analysis of

variables involved in hypothesis that tests synchronization operations in retail management and manufacturing management. Questionnaires from consumer adherence, pharmacy retail operations, and pharmaceutical manufacturer operations were used in preparing dependent variables and independent variables in hypotheses. Each dependent variables were test with multiple independent variables in each hypothesis. There were 10 hypotheses that were in consumer and pharmacy retail operations and 10 hypotheses that were in pharmacy retail operations synchronized with pharmaceutical manufacturer's operations. Each hypothesis was analyzed using multiple regression SPSS for level of significance to confirm that it affects each other and didn't happen by chance at significance level of 0.01.

Also, each hypothesis was analyzed using multiple correlations in to find the strength of relationship between variables. This study uses statistical significance of 0.01 because it was important for consumer behavioral scientific study that were important to business management operations.



## CHAPTER IV

### RESULTS AND DISCUSSION

#### **Subject Data**

There were 2000 questionnaires total scattered among retail pharmacies. A total of 1268 was able to process data. A total of 18 subject that were left out due to incompleteness at documentation enrollment. Maybe it was due to subject hesitation to enter the research because they might not be able to provide information continuously if they weren't available at times to fill-in the taking of supplementary items and the ones taken might be within their reach from time to time.

Information gathered were able to process into data sent to managers at retail stores and manufacturer for questionnaire completion. Population aging more than 90 is 0.32%, 80-90 is 2.05%, 80-70 is 10.00%, 60-70 is 5.77 %, 50-60 is 43.92%, and 40-50 is 37.93%. Gender of subject 44% were male and 56% were female.

Level of education 2.4% (128 subjects) were uneducated, 12.5% (159 subjects) finish some elementary level, 18.2% (230 subjects) finished elementary level, 8.4% (107 subjects) finish some high school level, 22.1% (280 subjects) finish high school level, 22.3% (283 subjects) finished bachelor's degree, 10.8% (137 subjects) finished master's degree, and 3.3% (42 subjects) finished doctorate degree. From this population 10.09% (128 subjects) have low income within less than 5,000 baht range, about 26.66% (338 subjects) were in 5,000-10,000 baht range, 22.08% (280 subjects) were in 10,000-15,000 baht range, 22.48% (285 subjects) were in 15,000-20,000 baht range, 9.23% (117 subjects) were in 20,000-25,000 baht range, 5.52% (70 subjects) were in 25000-30000 baht range, 3.31% (42 subjects) were in 30,000-35,000 baht range, and 0.71% (9) were in more than 35,000 baht range.

Job level ranging, 18.85% (239 subjects) were waged worker, 8.91% (113 subjects) were in managerial, 3.31% (42 subjects) were executives at some level, 40.85% (518 subjects) were self-employed, 22.71% (288 subjects) were government employee, and 5.36% (68 subjects) were unemployed and retired. Marital status about

46% (583 subjects) were single, 34.7% (440 subjects) were married, 9.31% (118 subjects) were divorced and 10.01% (127) were deceased.

There were 73.34% (930 subjects) subjects that fill out the form and 26.66% (338 subjects) have family members fill out for them. For web-based accession 85.09% (1079 subjects) were able to fill out themselves and 14.91% (189 subjects) had family members fill out for them. For taking supplements, 82.02% (1040 subjects) were able to take on their own and 17.98% (228 subjects) had family member or nurse help them take supplement. Most subjects were able to purchase the supplement on their own, accounting for 82.97% (1052 subjects), the rest 15.62% (198 subjects) had family member or friend purchase for them. There were 18 subjects (1.41%) whom friends and family members who purchase the supplement for them and they continue to use for long term health supplement.

Channel of purchase about 10.09% (128 subjects) bought from health store, 66.09% (838 subjects) bought from pharmacies, 15.46% (196 subjects) bought from distributors, and 8.36% (106 subjects) bought from web stores, although this wasn't permanently purchase continually, it was for the time when they were unable to make time for pharmacy visit. 45.98% (583 subjects) bought for continual improve in health conditions, 23.74% (301 subjects) bought for prevention of aging related mental deteriorations, 30.28% (304 subjects) bought for chronic health conditions. From taking supplement behaviors, there were 1268 subjects account for 100% of subjects throughout study, there 118 subjects whom were not eligible for data use because they take for lack of mental stamina, 133 subjects take for mental stamina when they were tired from work and feel lack of physical stamina when having prolong work hours, and some of these subjects about 48 were taking once a month for the same reason.

For prevention of health deterioration, 588 subjects or 46.37% take for prevention, 396 subjects (31.23%) take for minimizing chronic health condition, and 284 subjects (22.40%) took for prevention of health concerns. The reason for taking, about 841 (66.33%) subjects use because it is effective, 341 (26.89%) subjects use because of health concerns, and 28 (2.21%) subjects took because family members also take the supplements, and 58 subjects (4.57%) took because profession advise was helpful.



Purchase behavior, about 73.66% (934 subjects) purchased before they were out of pills, 0.95% (12 subjects) purchase when the pills ran out, and 25.39% (322 subjects) purchase when they were reminded by family members or whenever they remember. For 12 subjects, sometimes it is elderly behavior when they usually buy new bottles by bringing the empty bottle to pharmacies and health stores, it was seen a lot in retail practices which was related to self-practices of not forgetting.

In these population, 283 subjects (22.37%) forgot to take sometimes, about 50.25% (637 subjects) forget when they have extensive work, about 18.14% (230 subjects) were forgetful where the put supplements, and 118 subjects (9.3%) forgot from chronic disease related. For web accession, 942 subjects (74.29%) use notebooks or computer and 326 subjects (25.71%) use smart phones. About 38.01% (482 subjects) use internet for 1-2 hours, 326 subjects (25.71%) use 2-3 hours, 218 subjects (17.19%) use 4-5 hours, and 242 subjects (19.09%) use more than 5 hours of internet daily. The internet accession may be from their work, reading news, social network, and leisure. Most subjects visit pharmacies at least once a week, about 1032 subjects, 188 subjects visit once a month, and 48 subjects visit bi-monthly. 847 subjects bought supplement for health conditions, 71 bought for health trending and medical news, 112 took supplement because it was researched, and 238 subjects bought because it was cost effective for their health conditions. When question about telling friends and families taking the pill for deteriorate health conditions, 380 subjects were willing to tell, 38 subjects declined to tell, 118 would tell when remember, 648 subjects would tell because it is effective, and 84 subjects would tell because it is trendy and found in medical news. When questioned about using the supplement for other purposes, 1143 subject had not taken pills for other indications but 125 subjects took the pill for other indications. This may come from the fact that they were self-educate people or belong to self-referred individuals.

### **CONSUMER ADHERENCE MULTIPLE REGRESSION**

In multiple regression test, there were 1268 subjects total available that was used in calculation of the stud. This number was enough to confirm the consumer behavior that Cohen consumer behavior formula suggest the number to be more than

876 subjects. Below can be found the statistic test in multiple regressions and calculated statistics can be found in APPENDIX A for all statistics involved.

In multiple correlation score that shows Pearson's correlation at significance level  $\alpha = 0.01$  for all variables in this study can be found in APPENDIX B.

### **1<sup>st</sup> Key Cost Adherence Multiple Regression Score**

The statistic on Bottle Price And Continuity, Price Per Pill Economical, Cost Effective Pill, Supplement Alone Cost Effective, Bottle Price Fit Lifestyle, Travel Cost Affect Promotion Buy, Economical When Effective In Combination, Travel Expense Affect Base Purchase, Except for Bottle Price that has Pearson's correlation score of 1.000. Bottle Price And Continuity was 0.712, Price Per Pill Economical was 0.656, Cost Effective Pill was 0.706, Supplement Alone Cost Effective was 0.660, Bottle Price Fit Lifestyle was 0.723, Travel Cost Affect Promotion Buy was 0.724, Economical When Effective In Combination was, 0.721 and Travel Expense Affect Base Purchase was 0.717. The significant for all variables have significant value of 0.000, which was less than  $\alpha = 0.01$ . This can be concluded that all variables were correlated with each other at significance level.

ANOVA Score also shows significance value of 0.000. The coefficient score had significance less than 0.01 for all variable. The coefficient score had significance less than 0.01 for all variable. All coefficients were 0.000, except for Price Per Pill Economical with a significance of 0.004. This shows that all were significant. Calculated  $R^2$  was 0.579 which is strong for consumer behavior science study.

### **2<sup>nd</sup> Key Satisfaction-Adherence Multiple Regression Score**

The statistic for Continuous Satisfactory Pricing, Bottle Price Economical Year-Round, Price Shift Still Economical, Price Per Pill Economical, Multiple Bottle Price Purchased Economical, Quality Worth Purchase Price had strong Pearson's correlation score. Except for Satisfactory Price Effectiveness that has very strong score of 1.000. The score for Continuous Satisfactory Pricing was 0.706, Bottle Price Economical YearRound was 0.720, Price Shift Still Economical was 0.722, Price Per

Pill Economical was 0.703, Multiple Bottle Price Purchased Economical was 0.647, and Quality Worth Purchase Price was 0.725. The significant for all variables have significant value of 0.000, which was less than  $\alpha = 0.01$ . This can be concluded that all variables were correlated with each other at significance level.

ANOVA Score also shows significance value of 0.000. The coefficient score had significance less than 0.01 for all variable. All coefficients were 0.000, except for Price Per Pill Economical with a significance of 0.001, Supplement Alone Cost Effective was 0.005, Travel Cost Affect Promotion Buy was 0.005, Bottle Price Fit Life Style was 0.001, Travel Cost Affect Promotion Buy was 0.008, Economical When Effective In Combination was 0.001, and Travel Expense Affect Base Purchase was 0.007. This shows that all were significant. Calculated  $R^2$  was 0.581 which is strong for consumer behavior science study.

### **3<sup>rd</sup> Key Adherence Knowledge Multiple Regression Score**

The statistics on Increase Severity Increase Adherence, Health Care Provide Enough Indication Use, Health Care Provide Usage Knowledge, Long Term Knowledge Provided, More Adherence After Long Term Clarified, Improvement Helps More Adherence, Health Condition Remind Purchase, and Product Label Provide Same Advice have strong Pearson's correlation score, except for Health Care Provide Enough Knowledge that has Pearson's correlation score of 1.000. The score from Increase Severity Increase Adherence was 0.609, Health Care Provide Enough Indication Use was 0.662, Health Care Provide Usage Knowledge was 0.665, Long Term Knowledge Provided was 0.628, More Adherence After Long Term Clarified was 0.656, Improvement Helps More Adherence was 0.675, Health Condition Remind Purchase was 0.642, Product Label Provide Same Advice was 0.615. The significant for all variables have significant value of 0.000, which was less than  $\alpha = 0.01$ . This can be concluded that all variables were correlated with each other at significance level.

ANOVA Score also shows significance value of 0.000. The coefficient score had significance less than 0.01 for all variable. All coefficients were 0.000, except for Health Care Provide Usage Knowledge was 0.002 and More Adherence After Long

Term Clarification was 0.001. This shows that all were significant. Calculated  $R^2$  was 0.533 which is strong for consumer behavior science study.

#### **4<sup>th</sup> Key Adherence Promotion Multiple Regression Score**

The statistics for Price Adhere Long Term, Quality Price Adhere Long Term, Feelings Reach Made Purchased, Promotion Makes Frequent Visit At Retail, Repurchase Frequently Before Promotion Ends, Frequent Promotion Frequent Purchases, and Promotion Affect Continue Purchase For Long Term have strong Pearson's correlation score. Except for Before Promote Price Adherence Long term that has very strong Pearson's correlations score of 1.000. Pearson's correlation score for Price Adhere Long Term was 0.661, Quality Price Adhere Long Term was 0.641, Feelings Reach Made Purchased was 0.666, Promotion Makes Frequent Visit At Retail was 0.673, Repurchase Frequently Before Promotion Ends was 0.626, Frequent Promotion Frequent Purchases was 0.661, and Promotion Affect Continue Purchase For Long Term was 0.613. The significant for all variables have significant value of 0.000, which was less than  $\alpha = 0.01$ . This can be concluded that all variables were correlated with each other at significance level.

ANOVA Score also shows significance value of 0.000. The coefficient score had significance less than 0.01 for all variable. The coefficient score had significance less than 0.01 for all variable. The significant value for Price Adhere Long Term was 0.001 and Frequent Promotion Frequent Purchases was 0.002, while the rest were 0.000. This shows that all were significant. Calculated  $R^2$  was 0.523 which is strong for consumer behavior science study.

#### **5<sup>th</sup> Key EDUCATION ADHERENCE Multiple Regression Score**

The statistics for Healthcare Provide Answer For Adherence, Itemized Discussion Improve Adherence, Further Self Educated Improve Adherence, Education Language Were No Barrier, Re Counseling Is Not Need For Use, Felt More Positive For Use After Educated, and Information Easily Understood were strong in Pearson's correlation score. Produce Education Meet Expectation was very strong in Pearson's correlation score of 1.000. Pearson's correlation score for Product Education Meet Expectation was 1.000, Healthcare Provide Answer For Adherence was 0.602,

Itemized Discussion Improve Adherence was 0.640, Further Self Educated Improve Adherence was 0.642, Education Language Were No Barrier was 0.651, Re-Counseling Is Not Need For Use was 0.63, Felt More Positive For Use After Educated was 0.679, Information Easily Understood was 0.664. The significant for all variables have significant value of 0.000, which was less than  $\alpha = 0.01$ . This can be concluded that all variables were correlated with each other at significance level.

ANOVA Score also shows significance value of 0.000. The coefficient score had significance less than 0.01 for all variable. The coefficient score had significance less than 0.01 for all variable. The significant value for Education Language Were No Barrier was 0.007 and Information Easily Understood was 0.002, while the rest were 0.000. This shows that all were significant. Calculated  $R^2$  was 0.511 which is strong for consumer behavior science study.

#### **6<sup>th</sup> Key ADHERENCE BENEFITS Multiple Regression Score**

The statistics for More Adhere From Benefit Education, , Everyday Use Makes Adhere Long Term, Everyday Efficacy Improve Adherence, Perceive Benefit Encourage Long Term Use, , and More Adhere When Understood Manufacture Benefit were strong in Pearson's correlation score. For Long Term Adherence From Education Benefits, Long Term Safety Combination With Drugs, and Feel Safe Long Term From Standardization were very strong in Pearson's correlation score of 0.810, 0.805, and 1.000, respectively. The Pearson's correlation score for More Adhere From Benefit Education was 0.760, Everyday Use Makes Adhere Long Term was 0.799, Everyday Efficacy Improve Adherence was 0.796, Perceive Benefit Encourage Long Term Use was 0.766, and More Adhere When Understood Manufacture Benefit was 0.784. The significant for all variables have significant value of 0.000, which was less than  $\alpha = 0.01$ . This can be concluded that all variables were correlated with each other at significance level.

ANOVA Score also shows significance value of 0.000. The coefficient score had significance less than 0.01 for all variable. The significant value for Everyday Use Makes Adhere Long Term was 0.005, Every day Efficacy Improve Adherence was 0.005, and Perceive Benefit Encourage Long Term Use was 0.008, while the rest were



0.000. This shows that all were significant. Calculated  $R^2$  was 0.724 which is strong for consumer behavior science study.

### **WEB TRACKING ADHERENCE Multiple Regression Score**

The statistic for More Energetic When Use Technology Device, System Is More Convenient, Technology Accessible Help Forgetfulness, Web system Help Adherence Regularly, Feel More Confident In Supplement Use, More Robust In Track Efficiency, and Web Tracking Solve Adherence have strong Pearson's correlation score. Except for Have Problem With Adherence Regularly that has correlation score of 1.000. More Energetic When Use Technology Device was 0.699, System Is More Convenient was 0.702, Technology Accessible Help Forgetfulness was 0.714, Web system Help Adherence Regularly was 0.712, Feel More Confident In Supplement Use was 0.718, More Robust In Track Efficiency was 0.725, Web Tracking Solve Adherence was 0.660. The significant for all variables have significant value of 0.000, which was less than  $\alpha = 0.01$ . This can be concluded that all variables were correlated with each other at significance level.

ANOVA Score also shows significance value of 0.000. The coefficient score had significance less than 0.01 for all variable. The significant value for More Energetic When Use Technology Device was 0.002, Web System Help Adherence Regularly was 0.001, and Feel More Confident In Supplement Use was 0.001, while the rest were 0.000. This shows that all were significant. Calculated  $R^2$  was 0.580 which is strong for consumer behavior science study.

It can be seen that all from 6 factors on consumer adherence including web tracking usage for adherence have strong correlation scores throughout the statistical results. The Pearson's correlation scores were more than 0.6, suggests strong correlation between variables. Also, all Pearson's correlation scores have significance score of 0.000 on 1-tailed significance which shows significance, similar to all ANOVA scores on all 6 factors and web tracking that has significance of 0.000, meaning it is significant with all coefficients less than 0.01 for all variables involved in 6 factors and web tracking usage.



This can be said that all relationships between variables are correlate to each other and significance and coefficients confirm that it doesn't happen by coincidence. Also, all  $R^2$  shows goodness of fit in all factors and consumer adherence web tracking.

The test in hypothesis, there were total of 1180 people from workers and managers from pharmacy retail stores, pharmaceutical distributors, and government manufacturers whom participate in the research. Hypotheses were divided into 2 groups that reflects consumer behavior when synchronize with pharmacy retail store operations and reflects pharmacy retail operations when synchronized with government manufacturers.

### **Result of Hypothesis Testing of the Research**

#### ***Hypothesis Group 1: Consumer Behavior in synchronizing with Store Operation Management***

##### **Pricing Performance Affects Customer Adherence**

Statistic for Bottle Price, PillCostEffective, Supplement Effective, Price Fits Life Style have strong Pearson's correlation score. Except for Economic Price and Continuable Price that has very strong Pearson's correlation score. Economic Price was 0.802 and Continuable Price 1.000. Bottle Price was 0.723, PillCostEffective was 0.796, Supplement Effective was 0.787, Price Fits Life Style was 0.784. The significant for all variables have significant value of 0.000, which was less than  $\alpha = 0.01$ . This can be concluded that all variables were correlated with each other at significance level.

ANOVA Score also shows significance value of 0.000. The coefficient score had significance less than 0.01 for all variable. The significant value for Bottle Price was 0.004 and Supplement Effective was 0.008, while the rest were 0.000. This shows that all were significant. Calculated  $R^2$  was 0.679 which is moderate.

### **Sales Efficiency Affects Customer Adherence**

Sale Efficiency, Price Feeling Reach, ContinualUseDecision, and Repurchase Regardless Price have strong Pearson's correlation score, except for Sale Efficiency that has Pearson's correlation score of 1.000. The Pearson's correlation score for Price Feeling Reach was 0.653, ContinualUseDecision was 0.723, and Repurchase Regardless Price was 0.592. The significant for all variables have significant value of 0.000, which was less than  $\alpha = 0.01$ . This can be concluded that all variables were correlated with each other at significance level.

ANOVA Score also shows significance value of 0.000. The coefficient score had significance less than 0.01 for all variable. The significant value for Re Purchase Regard Price was 0.003. The rest have significant value of 0.000 for all item. This shows that all were significant. Calculated  $R^2$  was 0.67 which is moderate.

### **Retail Stocking Efficiency Affects Customer Adherence**

The score for Frequent Store Visit, At Visit Repurchase, Continue Purchase, and Multiple Purchase were strong in Pearson's correlation score. Except Adhere Long Term with a Pearson's correlation score of 1.000. Frequent Store Visit was 0.779, At Visit Repurchase was 0.782, Continue Purchase was 0.763, and Multiple Purchase was 0.768. The significant for all variables have significant value of 0.000, which was less than  $\alpha = 0.01$ . This can be concluded that all variables were correlated with each other at significance level.

ANOVA Score also shows significance value of 0.000. The coefficient score had significance less than 0.01 for all variable. The significant value for Frequent Store Visit was 0.004 and At Visit Repurchase was 0.004. The rest have significant value of 0.000 for all item. This shows that all were significant. Calculated  $R^2$  was 0.654 which is moderate.

### **Customer Satisfaction Affects Customer Adherence**

Adhere To Counsel, Satisfactory Language, Understood Care, and Answer Satisfactory were strong in Pearson's correlation score. Except Satisfactory After Educate that has value of 1.000. The score for Adhere To Counsel was 0.679,

Satisfactory Language was 0.754, Understood Care was 0.749, and Answer Satisfactory was 0.752. The significant for all variables have significant value of 0.000, which was less than  $\alpha = 0.01$ . This can be concluded that all variables were correlated with each other at significance level.

ANOVA Score also shows significance value of 0.000. The coefficient score had significance less than 0.01 for all variable. The significant value for Adhere To Counsel was 0.007 and the rest have significant value of 0.000 for all item. This shows that all were significant. Calculated  $R^2$  was 0.603 which is moderate.

#### **Sales Promotion Affects Customer Adherence**

The score for Quality Price Adhere, Purchase From Good Promotion, Price Affect Decision, Multiple Visit From Promotion has strong Pearson's correlation score. Except for Adhere Long Term that has Pearson's correlation score of 1.000. Quality Price Adhere was 0.769, Purchase From Good Promotion was 0.763, Price Affect Decision was 0.759, and Multiple Visit From Promotion was 0.758. The significant for all variables have significant value of 0.000, which was less than  $\alpha = 0.01$ . This can be concluded that all variables were correlated with each other at significance level.

ANOVA Score also shows significance value of 0.000. The coefficient score had significance less than 0.01 for all variable. The significant value for Price Affect Decision was 0.008. The rest have significant value of 0.000 for all item. This shows that all were significant. Calculated  $R^2$  was 0.621 which is moderate.

#### **Product Knowledge Affects Customer Adherence**

Perceive Knowledge Encourage, More Adhere Know Production, Understand Benefits, and Known Standardized Quality has strong Pearson's correlation score. Except for Long Term Use Adhere that has Pearson's correlation score of 1.000. Perceive Knowledge Encourage was 0.755, More Adhere Know Production was 0.761, Understand Benefits was 0.693, and Known Standardized Quality was 0.759.

The significant for all variables have significant value of 0.000, which was less than  $\alpha = 0.01$ . This can be concluded that all variables were correlated with each other at significance level.

ANOVA Score also shows significance value of 0.000. The coefficient score had significance less than 0.01 for all variable. The significant value for Perceive Knowledge Encourage was 0.001 and Understand Benefits was 0.007. The rest have significant value of 0.000 for all item. This shows that all were significant. Calculated  $R^2$  was 0.617 which is moderate.

#### **Consumer Adherence Affects Retail Sales Performance**

The score for Supply Chain Info, Sale Performance, Long Term Adherence, and Efficient Consumer Adherence has strong Pearson's correlation score. Except Refill Ability For Adherence that has Pearson's correlation score of 1.000. Supply Chain Info was 0.758, Sale Performance was 0.759, Long Term Adherence was 0.769, and Efficient Consumer Adherence was 0.761. The significant for all variables have significant value of 0.000, which was less than  $\alpha = 0.01$ . This can be concluded that all variables were correlated with each other at significance level.

ANOVA Score also shows significance value of 0.000. The coefficient score had significance less than 0.01 for all variable. The significant value for Sale Performance was 0.006. The rest have significant value of 0.000 for all item. This shows that all were significant. Calculated  $R^2$  was 0.620 which is moderate.

#### **Retail Stocking Efficiency Affecting Retail Sales Performance**

The score for SupplyChainInformationSharing, RefillEfficiencyForAdherence, RetailOperationEfficiency, StockingForecastRefill, SupplyChainEfficiency, and WarehouseSupplyChainForecast has strong Pearson's correlation score. Except for SalePerformance that has Pearson's correlation score of 1.000. SupplyChainInformationSharing was 0.758, RefillEfficiencyForAdherence was

0.775, RetailOperationEfficiency was 0.733, StockingForecastRefill was 0.700, SupplyChainEfficiency was 0.777, and WarehouseSupplyChainForecast was 0.759. The significant for all variables have significant value of 0.000, which was less than  $\alpha = 0.01$ . This can be concluded that all variables were correlated with each other at significance level.

ANOVA Score also shows significance value of 0.000. The coefficient score had significance less than 0.01 for all variable. The significant value for RetailOperationEfficiency was 0.002 and StockingForecastRefill was 0.001. The rest have significant value of 0.000 for all item. This shows that all were significant. Calculated  $R^2$  was 0.658 which is moderate.

### **Retail Sales Performance Affects Retail Profit Performance**

The score for IncreaseProfitInTime, RegionalProfit, SustainProfit, and SalePromotion has strong Pearson's correlation score has strong Pearson's correlation score. SalePerformance has very strong Pearson's correlation score of 0.800 and ProfitPerformance that has Pearson's correlation score of 1.000. IncreaseProfitInTime was 0.783, RegionalProfit was 0.785, SustainProfit was 0.795, and SalePromotion was 0.721. The significant for all variables have significant value of 0.000, which was less than  $\alpha = 0.01$ . This can be concluded that all variables were correlated with each other at significance level.

ANOVA Score also shows significance value of 0.000. The coefficient score had significance less than 0.01 for all variable. The significant value for RegionalProfit was 0.009 and Sale Promotion was 0.005. The rest have significant value of 0.000 for all item. This shows that all were significant. Calculated  $R^2$  was 0.676 which is moderate.

### **Retail Sales Efficiency Affects Retail Profit Performance**

The score for EfficientSaleContinuousProfitPerformance, LongTermAdherencePricePerformance, EfficientConsumerAdherence, EfficientSaleIncreaseAdherence, EfficientSalePricePerformance, StockRefillEfficiency, and ContinuousSalePromotion has strong Pearson's correlation score. Except ProfitPerformance that has Pearson's correlation score of 1.000. EfficientSaleContinuousProfitPerformance was 0.776, LongTermAdherencePricePerformance was 0.697, EfficientConsumerAdherence was 0.773, EfficientSaleIncreaseAdherence was 0.774, EfficientSalePricePerformance was 0.752, StockRefillEfficiency was 0.761, and ContinuousSalePromotion was 0.772. The significant for all variables have significant value of 0.000, which was less than  $\alpha = 0.01$ . This can be concluded that all variables were correlated with each other at significance level.

ANOVA Score also shows significance value of 0.000. The coefficient score had significance less than 0.01 for all variable. The significant value for LongTermAdherencePricePerformance was 0.001, EfficientSaleIncreaseAdherence was 0.001, and EfficientSalePricePerformance was 0.006. The rest have significant value of 0.000 for all item. This shows that all were significant. Calculated  $R^2$  was 0.661 which is moderate.

For all hypotheses in group 1, it can be seen that multiple regression shows significance for all variables and conclude that all multiple independence variables affect dependent variables with significance in multiple regression score and strong Pearson's correlation. Also, ANOVA in every hypothesis items have statistics shows significance score of 0.000 for all hypotheses. It can be concluded that all independent variables in group 1 were affected by their multiple independent variables with significance  $\alpha$ -value less than 0.01. The  $R^2$  in all hypotheses test were found to be at moderate level, however the statistical value in each hypotheses were found to be significant. So, this can be concluded that all were acceptable.



## **Hypothesis Group 2: Retailer and Manufacturer Supply Chain Synchronization**

### **Retailer Stocking Efficiency Affects Efficient Production Strategy**

The score for RetailRestockStrategy, RetailSynchronizeStock, SynchronizeDisruptionMinimize, RetaileSynchronizeStrategicProduction, WarehouseSustainable, EfficientRetailWareHouse, StrategicWarehouseSynchronize, DeliveryStrategicForecast, and ManufactureForecastStock has strong Pearson's correlation score. Except for ProductionStrategy that has Pearson's correlation score of 1.000. RetailRestockStrategy was 0.745, RetailSynchronizeStock was 0.747, SynchronizeDisruptionMinimize was 0.734, RetaileSynchronizeStrategicProduction was 0.728, WarehouseSustainable was 0.748, EfficientRetailWareHouse was 0.674, StrategicWarehouseSynchronize was 0.699, DeliveryStrategicForecast was 0.765, and ManufactureForecastStock was 0.742. The significant for all variables have significant value of 0.000, which was less than  $\alpha = 0.01$ . This can be concluded that all variables were correlated with each other at significance level.

ANOVA Score also shows significance value of 0.000. The coefficient score had significance less than 0.01 for all variable. The significant value for RetailSynchronizeStock was 0.001, SynchronizeDisruptionMinimize was 0.002, WarehouseSustainable was 0.002, EfficientRetailWareHouse was 0.001, StrategicWarehouseSynchronize was 0.002 and DeliveryStrategicForecast was 0.009. The rest have significant value of 0.000 for all item. This shows that all were significant. Calculated  $R^2$  was 0.643 which is moderate.

### **Retailer Order Fulfillment Affects Efficient Production Operation**

The score for SynchronizeOperationMeetDemand, SynchronizeOrderEfficientOperation, OrderRestockDemandMet, SupplyChainOperationEfficient, SynchronizeOrderEfficientStorage, EfficientManufacturingOnTime, EfficientSustainWhileDemandOnRise, and EffectiveRefillOrderOperation has strong Pearson's correlation score. Except for ManufacturerFullfillDemandOnTime that has Pearson's correlation score of 1.000. SynchronizeOperationMeetDemand was 0.727, SynchronizeOrderEfficientOperation was 0.741, OrderRestockDemandMet was 0.663, SupplyChainOperationEfficient was

0.750, SynchronizeOrderEfficientStorage was 0.674, EfficientManufacturingOnTime was 0.700, EfficientSustainWhileDemandOnRise was 0.767, and EffectiveRefillOrderOperation was 0.740. The significant for all variables have significant value of 0.000, which was less than  $\alpha = 0.01$ . This can be concluded that all variables were correlated with each other at significance level.

ANOVA Score also shows significance value of 0.000. The coefficient score had significance less than 0.01 for all variable. The significant value for OrderRestockDemandMet was 0.008 and EffectiveRefillOrderOperation was 0.002. The rest have significant value of 0.000 for all item. This shows that all were significant. Calculated  $R^2$  was 0.640 which is moderate.

### **Retailer Stocking Efficiency Affects Efficient Warehouse Strategy**

The score for RetailStockingEfficiency, StrategicEfficientDelivery, SupplyChainEfficient, RetailLogisticStrategy, and EfficientLogisticStrategy has strong Pearson's correlation score.. Except WarehouseStrategyEfficient that has Pearson's correlation score of 1.000. RetailStockingEfficiency was 0.635, StrategicEfficientDelivery was 0.730, SupplyChainEfficient was 0.737, RetailLogisticStrategy was 0.665, and EfficientLogisticStrategy was 0.700. The significant for all variables have significant value of 0.000, which was less than  $\alpha = 0.01$ . This can be concluded that all variables were correlated with each other at significance level.

ANOVA Score also shows significance value of 0.000. The coefficient score had significance less than 0.01 for all variable. The significant value for RetailStockingEfficiency was 0.002 and StrategicEfficientDelivery was 0.002. The rest have significant value of 0.000 for all item. This shows that all were significant. Calculated  $R^2$  was 0.592 which is moderate.

### **Retailer Stocking Efficiency Affects Efficient Warehouse Operation**

The score for RetailStockingEfficiency, EfficientDelivery, WarehouseEfficiencyPerforms, StockingMeetUrgentMarket, and WarehouseDeliveryOnTime has strong Pearson's correlation score. Except EfficientWarehouseOperationStrategy that has Pearson's correlation score of 1.000. RetailStockingEfficiency was 0.674, EfficientDelivery was 0.701,

WarehouseEfficiencyPerforms was 0.753, StockingMeetUrgentMarket was 0.665, and WarehouseDeliveryOnTime was 0.734. The significant for all variables have significant value of 0.000, which was less than  $\alpha = 0.01$ . This can be concluded that all variables were correlated with each other at significance level.

ANOVA Score also shows significance value of 0.000. The coefficient score had significance less than 0.01 for all variable. The significant value for EfficientDelivery was 0.002, StockingMeetUrgentMarket was 0.002, WarehouseDeliveryOnTime was 0.001. The rest have significant value of 0.000 for all item. This shows that all were significant. Calculated  $R^2$  was 0.623 which is moderate.

#### **Retailer Order Fulfillment Affects Efficient Logistic Strategy**

The score for OrderCreatesStrategy, EffectiveLogisticStrategy, VisibilityReStockingOrder, WarehouseReorder, ReorderEffective, HighDemandReorder, and ForecastRetailReOrder has strong Pearson's correlation score. Except EfficientLogisticStrategy that has Pearson's correlation score of 1.000. OrderCreatesStrategy was 0.738, EffectiveLogisticStrategy was 0.741, VisibilityReStockingOrder was 0.727, WarehouseReorder was 0.750, ReorderEffective was 0.700, HighDemandReorder was 0.767, and ForecastRetailReOrder was 0.663.

The significant for all variables have significant value of 0.000, which was less than  $\alpha = 0.01$ . This can be concluded that all variables were correlated with each other at significance level.

ANOVA Score also shows significance value of 0.000. The coefficient score had significance less than 0.01 for all variable. The significant value for OrderCreatesStrategy was 0.006, OrderCreatesStrategy was 0.004. The rest have significant value of 0.000 for all item. This shows that all were significant. Calculated  $R^2$  was 0.634 which is moderate level.

#### **Retailer Order Fulfillment Affects Efficient Logistic Operation**

The score for EffectiveLogisticStrategy was 0.767, VisibilityReStockingOrder was 0.776, and ReOrderEffective was 0.783 has strong Pearson's correlation score.

EffectiveSynchronizeLogistic was 0.819, OrderCreatesEffectiveOperation was 0.800, WarehouseReorder was 0.894, HighDemandReOrder was 0.885, ForecastRetailReOrder was 0.840 have very strong pearson's correlation score.

EfficientLogisticOperation that has Pearson's correlation score of 1.000. The significant for all variables have significant value of 0.000, which was less than a = 0.01. This can be concluded that all variables were correlated with each other at significance level.

ANOVA Score also shows significance value of 0.000. The coefficient score had significance less than 0.01 for all variable. The significant value for OrderCreatesEffectiveOperation was 0.006, ReOrderEffective was 0.004, ForecastRetailReOrder was 0.004. The rest have significant value of 0.000 for all item. This shows that all were significant. Calculated  $R^2$  was 0.866 which is high level.

### **Retailer Order Fulfillment Affects Operation Efficient Budget Expense**

The score for RetailSynchronizeManufacturingOperation, SaveCostOperation, VisibilityReStockingOrder, WarehouseReorder, EffectiveOrderfulfillmentTiming, HighDemandReorder, ForecastRetailOrder, ForecastOperationOnDemand has strong Pearson's correlation score. Except OperationEfficientlySaveExpenditure that has Pearson's correlation score of 1.000. RetailSynchronizeManufacturingOperation was 0.736, SaveCostOperation was 0.648, VisibilityReStockingOrder was 0.669, WarehouseReorder was 0.745, EffectiveOrderfulfillmentTiming was 0.735, HighDemandReorder was 0.716, ForecastRetailOrder was 0.762, and ForecastOperationOnDemand was 0.695. The significant for all variables have significant value of 0.000, which was less than a = 0.01. This can be concluded that all variables were correlated with each other at significance level.

ANOVA Score also shows significance value of 0.000. The coefficient score had significance less than 0.01 for all variable. The significant value for SaveCostOperation was 0.002, EffectiveOrderfulfillmentTiming was 0.002. The rest

have significant value of 0.000 for all item. This shows that all were significant. Calculated  $R^2$  was 0.631 which is moderate level.

### **Manufacturer Operation Strategy Affects Efficient Retail Supply Chain Sustainability**

The score for PlanSynchronizeStrategy, ForecastMarketPlan, PurchaseRawMaterial, PurchaseEffectively, MarketGrowthSynchronize, DisruptionPrevention, StrategicProductionSynchronized, RawMaterialSustainable has strong Pearson's correlation score. Except EfficientRetailSupplyChainSustainable that has Pearson's correlation score of 1.000. PlanSynchronizeStrategy was 0.600, ForecastMarketPlan was 0.739, PurchaseRawMaterial was 0.731, PurchaseEffectively was 0.648, MarketGrowthSynchronize was 0.714, DisruptionPrevention was 0.754, StrategicProductionSynchronized was 0.695, and RawMaterialSustainable was 0.672. The significant for all variables have significant value of 0.000, which was less than  $\alpha = 0.01$ . This can be concluded that all variables were correlated with each other at significance level.

ANOVA Score also shows significance value of 0.000. The coefficient score had significance less than 0.01 for all variable. The significant value for PlanSynchronizeStrategy was 0.008, PurchaseRawMaterial, was 0.001, PurchaseEffectively was 0.007, and MarketGrowthSynchronize was 0.003. The rest have significant value of 0.000 for all item. This shows that all were significant. Calculated  $R^2$  was 0.591 which is moderate level.

### **Synchronized Manufacturing Performance Affects Retail Profit Performance**

The score for SynchronizeProductionMeetRetailPerformance, ConsumerExpansionPerformance, ManufacturingMeetMarketGrowth, SynchronizeLogisticDisruptionPrevention, ManufacturingMeetProfitPerformance, ManufacturingMeetPromotionOrder, ManufacturingMeetMarketDemand, and SynchronizeWarehouseEfficiencyMeetRetailPerformance has strong Pearson's

correlation score. Except RetailProfitPerformance that has Pearson's correlation score of 1.000. SynchronizeProductionMeetRetailPerformance was 0.616, ConsumerExpansionPerformance was 0.665, ManufacturingMeetMarketGrowth was 0.736, SynchronizeLogisticDisruptionPrevention was 0.710, ManufacturingMeetProfitPerformance was 0.763, ManufacturingMeetPromotionOrder was 0.697, ManufacturingMeetMarketDemand was 0.671, and SynchronizeWarehouseEfficiencyMeetRetailPerformance was 0.737. The significant for all variables have significant value of 0.000, which was less than  $\alpha = 0.01$ . This can be concluded that all variables were correlated with each other at significance level.

ANOVA Score also shows significance value of 0.000. The coefficient score had significance less than 0.01 for all variable. The significant value for SynchronizeProductionMeetRetailPerformance was 0.001, ConsumerExpansionPerformance was 0.006, ManufacturingMeetMarketGrowth was 0.002, and ManufacturingMeetMarketDemand was 0.001. The rest have significant value of 0.000 for all item. This shows that all were significant. Calculated  $R^2$  was 0.635 which is moderate level.

### **Synchronized Manufacturing Efficiency Affects Retail Profit Performance**

The score for ManufacturingMeetPromotionOrder, EfficientWebSynchronizeProduction, ManufacturingOperationOnTime, ManufacturingMeetMarketDemand, SynchronizationBetweenWarehousesStocks, ManufacturingMeetMarketGrowth, MachineEfficiencyMeetConsumerExpansion, SynchronizeForecastMeetRetailDemographicGrowth, and ProductionMeetsRetailOrderEfficiently has strong Pearson's correlation score. Except for RetailProfitPerformance that has Pearson's correlation score of 1.000. ManufacturingMeetPromotionOrder was 0.587, EfficientWebSynchronizeProduction was 0.564, ManufacturingOperationOnTime was 0.567, ManufacturingMeetMarketDemand was 0.640, SynchronizationBetweenWarehousesStocks was 0.657,



ManufacturingMeetMarketGrowth was 0.643,  
 MachineEfficiencyMeetConsumerExpansion was 0.678,  
 SynchronizeForecastMeetRetailDemographicGrowth was 0.620, and  
 ProductionMeetsRetailOrderEfficiently was 0.500.

The significant for all variables have significant value of 0.000, which was less than  $\alpha = 0.01$ . This can be concluded that all variables were correlated with each other at significance level.

ANOVA Score also shows significance value of 0.000. The coefficient score had significance less than 0.01 for all variable. The significant value for ManufacturingMeetPromotionOrder was 0.007, ManufacturingOperationOnTime was 0.006, ManufacturingMeetMarketGrowth was 0.004, ManufacturingMeetMarketGrowth was 0.004, SynchronizeForecastMeetRetailDemographicGrowth was 0.001, ProductionMeetsRetailOrderEfficiently was 0.009 and ManufacturingMeetMarketDemand was 0.002. The rest have significant value of 0.000 for all item. This shows that all were significant. Calculated  $R^2$  was 0.541 which is moderate level.

For all hypotheses in group 2, it can be seen that multiple regression shows significance for all variables and conclude that all multiple independence variables affect dependent variables with significance in Multiple Regression Score and have strong Pearson's Correlation Score. Also, ANOVA in every hypothesis items have statistics shows significance score of 0.000 for all hypotheses. It can be concluded that all independent variables in group 2 were affected by their multiple independent variables with significance  $\alpha$ -value less than 0.01. The  $R^2$  in all hypotheses test were found to be at moderate level, except for Hypotheses on Retail Order Fulfillment Affects Efficient Logistic Operation that has  $R^2$  value of 0.866 which is found to be high level. With the statistical value in each hypotheses were found to be moderate; their corresponding significant value were found to be significant at 0.01 level. So, this can be concluded that all were acceptable.

## RESEARCH INTERVIEWS

A total of 1,268 has long term use for the bacopa tablets and all were in complete adherence on everyday use. From 261 people that use, did not use on an everyday basis but were ask about their usage behavior. It was found that 97 people use it for mental improvements from tiredness and mental functions with multi vitamin B from less appetite. This was found it was non-repetitive less than a month interval. Some used it for recovery from exhaustion from alcohol consumption. This may come from prior use of physical enhancement health supplement for people whom consume large alcohol. Most supplement products used in conjunction with Bacopa, usually were in a range of 1-2 days, but continued use of bacopa extract during day 1 to 4 have benefits on mental stamina and enhance memory. Bacopa seems to have help memory enhance when used in the age range 40-50 years. All had some health deterioration in the past when use bacopa extract and seemed to help

may have effect more than placebo in results. Although, future larger trials may be need to confirm findings.

From starting the trial, about 4 % of people whom find the web address useful without scanning the bottle use the computer extensively for the purpose of keeping track of usage. Unless they travel or on a leisure activity, they would use the phone carrying with them. This means that they use the phone less for the activities. The rest 96 % of people uses telephone and sometime uses computer as tool for keeping track most of the time, since the scanning QR barcode can be transfer using simple webtool in the browsers. In modern browsers contain a built-in QR code exporter that can manage webpage by translate into QR code whenever applicable. This can prevent disruption that may come from the fact that over length of time, QR code on the bottle may wear off. Subjects were constantly reminding that they can print out from webpage or request a new one from the researcher.

The interviews for qualitative consumer behavior interview and its discussion can be found below, follow by retailer interview and discussion, and manufacturer interview and discussion.

### CONSUMER ADHERENCE INTERVIEW

Please state how long have you been using the product, usage frequency, and lifestyle involved.

From the study, 114 people use it for mental stress from continuous work on the days they weren't getting enough rest. Out of these 211 individuals, bacopa was found using with other health supplements that enhance physical stamina and bacopa was used for mental strength purposes. In Table 1-3 can depict statistic on subjects whom were exclude from the study and their uses of bacopa extracts 300 mg.

Subject	Duration	N	%
Mental improvement from physical tiredness	Less than 1 week	97	37.16
Mental and physical recovery from sleeplessness	Less than 1 week	114	43.68
Mental function from stress	Less than 2 weeks	50	19.16
<b>Total</b>		261	

Subject	Age	N	%
Mental improvement from physical tiredness	40-55	97	37.16
Mental and physical recovery from sleeplessness	40-55	114	43.68
Mental function from stress	40-55	50	19.16
<b>Total</b>		261	

Customer in the study were individuals in selected group of 1268 people. Statistics for taking were 18.85% (239 subjects) were waged worker, 8.91% (113 subjects) were in managerial, 3.31% (42 subjects) were executives at some level, 40.85% (518 subjects) were self-employed, 22.71% (288 subjects) were government

employee, and 5.36% (68 subjects) were unemployed and retired. Input used were either web browser from pc and phone. For personal computer, direct webpage access was used when given the web page access for use. For phone access, a QR code scanner was used to access the webpage through scanning the sticker on the bottle. With the affordability of current smart phones available from China and Korea, many people were accessible to smart phone and their convenience. When interviewed, only 35% whom still use smart phones still use computer for their input whenever they were working or using it for leisure. The rest used smart phones for accession and input of everyday tablet use. Although, to be note that 15.62% of these have their family members fill out for them at times.

32% consumers have used bacopa for more than 12 months, 43% have used for more than 6 months, and the rest 25% have used for more than 3 months prior use. Usage frequency was different from each by their level of severity in disease. Life style of people whom used for health function were geriatric age 70-80 whom were still able to move and enjoy retirement. For aging 80-90 many were either sedimentary and disable, with aging more than 80 years old. Some were unable to move but still take the supplement for memory deficiency and help physical wellbeing of sensory and movement tones. Aging from 80 – 90, 28 people were disable whom had their family members prepare the tablets for them along with other chronic medicines for their conditions. 17 were female and 11 were male, all were fragile with minor movements.

Most subject were waged worker, in employees' positions and managerial positions. Some were self-employed, see statistics. Lifestyle of subjects 40-50 were very active with socialization, sporting, and overwork in late hours. Stress and tiredness were common among this age, all through retirement year. Bacopa uses were use to improve health in long term for sustaining in physical health and mental stamina. It was seen using with multivitamins and vitamin b complex when feeling very tired and mental fatigue was present. This account for wage workers, managerial, and executives whom work extra hours and chronic fatigue was involved with work operations and plannings. Also, frequent of use were seen in self-employed people

also. Moreover, from these participants some that were stress from work, also active in sports finds bacopa extract and multivitamins help them recover faster.

*It can be recall that, one subject used bacopa extract for feel lack of physical stamina when having prolong work hours and with a lot of attention having to pay with family after work, with helping kids with their school work. It is a lot of thinking and mental stress, as physical fatigue tends to accumulate, bacopa extract alone and multivitamins use with sometime enables them to concentrate with kids better and work better during the days.*

Repeatedly, when ask the same question to subjects, it was seen prolong mental weariness can cause physical fatigue also, and this led to continuous use until efficacy was seen a long-term use was effective for their conditions prolong from worsening. It was safe using with vitamins and supplements. It is safe to use with other every stimulant such as coffee and non-caffeinate tea. The type that gives aroma and exotic experience to consumer rather than the after effect of caffeine alone. For example, the Chai tea from Teavana brands. Also, for people whom doesn't drink coffee but benefit from mild caffeine drinks such as morning Ceylon tea and variety of tea also benefit from bacopa extract as well for their daily work mental stamina.

*One described taking bacopa extract every morning with vitamin B complex, help stimulate their mental alertness and readiness for morning hurdles for people whom uses their strength and physical movements to get jobs done. Another whom were office workers also seem prepared in the morning and less fatigue from night rest, even if they have to get up early for catching morning bus to work before the traffic would get jammed.*

This can account for all subjects involved with bacopa extracts for using in their active sport lifestyle, late night work stress, and retirement life. For people whom retirement close to disabilities with less movement involved. Bacopa was used to help their movement from neurological benefits toward the conditions.

*One subject agreed with many described using bacopa extract as beneficiary to muscle movement and muscle tones, which they also take supplementary dairy products made from USA that helps restore and preserved their muscle mass and help*

*them with their fragile movements when they use medical canes to walk. It was seen that with muscle mass restore from medical nutrition, bacopa seem to benefits their daily activity in movements and mental functioning with or without vitamins prescribed by geriatric family physician from time to time. It served very well as baseline supplement to geriatric medical nutrition.*

It can be summarized that for their life style, 588 subjects or 46.37% take for prevention of health defects or condition that may happen, for those having chronic conditions happening early were taking pills, which were 396 subjects (31.23%), while active subjects that were prone to stress work and active at sports about 284 subjects (22.40%) took for prevention of health concerns.

With people who have frugal lifestyle, bacopa extract seems to be affordable among all groups, without affect from transportation fees that can be a barrier to purchase at base price and promotion price. Although, retail setting offers discounts at some stores didn't have effect on power to purchase for customer visiting to purchase for long term use. Also, the web price promotion of 20 bottles were seen with larger families with elderly living together. This can be summarizing that bacopa extract prices at retail and web were affordable among frugal lifestyle people whom sees bottle and effectiveness were worth the purchase.

When given the reason why they continued to use the product, it is because there is no better alternatives after the medicine they are taking. Multiple subjects when living sedimentary lifestyle that they can't move around really well, they rely on medicines that help them with muscle wasting. Many those were given vitamins also use bacopa extract for neuromuscular benefits to vitamin b given by doctors. Many of these numbers were more than 80 years old. Account for 25% of aging 80 – 90 or more group. Some that were in 70 begin to have muscle weaknesses and bacopa seem to help with sturdy pain and shakiness on a daily basis. Accounts for 14% for 70-80 years old. Although some of the subjects about one-third of people in the group that have taken bacopa for more than 1 year have experience with bacopa that were non-extract, seemed to benefit from the bacopa capsules also. These were taken with modern medicines for neurological problems and muscular problems in geriatrics without any problem. Also, the use with ayurvedic and Thai medicines were also safe.



*The flavor of the tablet doesn't have notable odor and was palatable for all subject. One of the reasons they continued to use the bacopa extract was the similarity of traits that Thai and Indian were the same and bacopa itself were ayurvedic origin. Also, studies of certain products available as mental enhancement, non were close to as safe as bacopa because it was consumed priorly as vegetables. In large or small consumption would give same safety results.*

Most things they can rely on for muscle mass was medical nutrition that were available at pharmacies. Some whom were able to take dairy product uses normal type of milk, when some were lactose-intolerant, rely on multiple products to keep muscle mass at pace with deteriorating health. With non available modern medicine that can be afford by lower income people, bacopa extract was the best alternative to Thai national formulary drugs given to them from doctors at government-owned hospitals. One subject of many described the same feelings;

*There wasn't any available drug at the hospital they attend, since it wasn't private or specialize hospital that have drugs available for their condition. The age-limiting movement of muscle and mental readiness seemed to have a limited set of available drugs for use. There were many supplements available as tonic, muscle tonic, fatigue stimulants, and rejuvenations but none were quite like bacopa on mental stamina and memory that can help muscle movement.*

Another subject with older age in the group 80-90 told;

*When their body gets week and feel less vitality from food, they usually consume medical nutrition milk that helps them feel more refresh depending on their health needs. Some that were diabetics taken specialize dairy product that also help them with sugar level. With health getting worse from diabetes making their nerve feel painful and deteriorating health, vitamins that benefit painful nerves also show benefits when use with bacopa that were taken together for nervous system benefits. Although, bacopa wasn't use as pain ayurvedic supplement but it was sort as supplements that can help peripheral nervous.*

From this, it can be seen that people whom their health deteriorates from chronic disease other than age-related reason, seem to benefit and resort to bacopa for health benefits.

*Also, there was no alternative from the fact that they know what supplement was effective for their condition. Many modern supplement extracts show benefits but weren't use widely and may be more expensive when use long term. Certain supplements of tonic were also use in conjunction with bacopa when they felt they need more vital stimulation. Bacopa was seemed the safest herbal supplement for their conditions because prior extraction, it was consumed as daily vegetables.*

Many people were in low income and mid income range, for the fact that continuous use may require lower price all the time.

*Current economy has not shown any improvement in economic data when taken GDP and income survey into account. Many customers were in suburban areas had less income than metropolitan people. So, for affordable range of the herbal supplement, bacopa was the lowest in price and effective one that people can find on the market. Also, bacopa of competitor brand were not extract but capsule of herbal powder. It also cost more than the extract in a range of 100 – 150 baht.*

Although there has been customer that use other brand and had resort to the GPO brand because it was standardize tablet, so they were confident with the factor that standardize pill would have same amount of effective dosage in every pill after it is made. So, this show that customer was were highly educate about products from the pharmacist. It can be inferring that adherence from education that was another factor that affects long term usage. When ask multiple subjects, all have agreed that

*Standardize pills were one of the crucial new knowledge areas to them, that all pills were create equal in effectiveness from standardize raw materials extract made by manufacturer. It guarantees them of equal amount of active ingredient dosage when taken without worrying about their conditions will be benefit from lower active ingredients. Also, the seeing of improvements on their current conditions, the standardization made them more confident of use.*

This confident of use, also have effect on brand value, it brings effectiveness into account that leads to customer satisfaction. Product brand value with good service value, leads to good customer experience as a journey that can benefit service recovery, if any would damage brand value. This continual use in product leads to continuous income for one product, and with each customer visit would bring opportunity for another product on shelf to service customer needs. This can be seen as benefit to retail store for making more money. In the future, sale analysis can be made using certain type of statistics such as R statistics for basket analysis. This can be used to forecast purchase, bring in and out product brands that are likely to be sell or sell together.

Towards the reason why they discontinued the product, were 261 people whom were not include in the study. Although, they didn't discontinue the product entirely on ineffectiveness. It is just they randomly use for purposes of mental recovery from mental stress, strenuous work that requires mental and physical energy, and not getting enough rest. People in age older in the range of 80 to 90 and more than 90 were still in use of the bacopa and seem to have benefits from the extracts. Although, in people whom severity has not shown benefits may stop using the product for the reason that their conditions and pain may be enough to benefit from modern medicine and medical intervention that may help them better.

*One customer describes benefits of bacopa from restlessness recovery from stress and from excessive work until morning. The use of bacopa help them recover almost the same when they were in their 20's – 30's. The effect of bacopa was seen in mental and physical stamina, with or without other tonic supplements. Of these people, whom work in non-managerial level, some taken bacopa extract with herbs for muscular aches, they were also seen to recover better from strenuous labor.*

Another use in long term was for memory and learning, people whom use this for neuromuscular stamina was found that their memory was better at recall. So, this leads to continuation of product in pre-geriatric and geriatric. Also, the continuation in strategic thinking people in managerial positions were using the bacopa extract continually because they are involved in the strategic planning.

*With Bacopa extract helps mental focus to stay on subject that comes up involving strategic management and long-term planning of business to stay on what's on the table and what is coming around the area of interest. When long term planning is involved, usual work days involved a lot of new information makes you stay up longer before retiring from the day of work. Sometimes it causes sleeplessness when thinking about new view of planning, bacopa seemed to lessen the anxiety involved also.*

*Another subject adds "with long term stress on important matters and anxiety, memory deficits can happen during days that didn't get enough rest, focusing on important matters may be impaired as length of project progress. The whole thing requires a lot of memory and learning, patterns of staying up and retire late becomes trends that you can't avoid. Amending the body's ability to stay focus with mental clarity, good memory and learning, all can benefit from bacopa extract." It also does help with the after project, when anxiety still have its way around your jobs.*

We can see from this point of view that bacopa does help more than memory impairment use in elderly, with right education from pharmacist and health counselor we can see that people in society does benefit more from what it was researched and used primarily for. If more people in this area increases, synchronization would be more important to keep business readily for the intervention of shelving scarcity in retailers, both state organization owned retailer, distributor, and third-party resellers in retail and e-commerce. The web synchronization in this study can play important role in repurchasing through e-commerce channel and retail channel. When numbers of each demographic people increase or decrease, the reason why they were taking the pills can be documented in the system and then demographic usage data can infer to set of symptoms that were accumulating, hence this information can be use further to prepare market data for next herbal supplement or modern pharmaceuticals for the population increase of symptoms in demographic area presented. This can bring more profit to retail and manufacturer by understanding demographic data of users for their symptoms.

Continuity of product use apart from enhancing memory and learning, 89% of people in the age between 70-80 were taking to prevent memory deficits and 93%

of the people whom were in the of 80 or more were taking to prevent memory loss from aging.

*Usage of bacopa every day without having neurological symptoms in memory loss and problems recall, makes people whom use it feel more confidently in living their live healthier and socially active among geriatrics. When ask about their feelings, mostly felt their mental alertness were younger. They believe that bacopa would help lengthen the time they will have memory deficits from aging and some that read medical news believe that it might help prevent Alzheimer at some point.*

*For geriatrics whom couldn't talk much and bed stayed most of the time, could still remember a lot of simple things when were ask by family members, these minor populations in the study were still taking bacopa extracts to aid in memory loss, recall, and cognition. It was seen as an effective supplement and safe in long term use. Population of fragile health in this study were already have taken bacopa extract for more than a year, although some have changed from non-extract version to the 300 mg extract version of bacopa. All of these population seem to do really well with the extract and its safety.*

So, summarizing the continuation of bacopa extract were seen because of its long-term safety and efficacy of use, in fragile population and non-fragile population. Long-term use was in for people who were managerial, non-managerial labor worker, and retired people who are pre-geriatric aging towards geriatrics. This continuation leads to steady income of retail stores and enabling good synchronization with the manufacturer that can solve supply chain resilienceness in the future. Thereby, securing market share with good product that can help consumer health and grow with consumer needs from current to future point, where further products can help them.

We can see this as retail store and manufacturer helping more and more people, that can harness a lot of capitols from marketing. With a lot of capitols to use, marketeers can see how they can grow with consumer from time to time, returning profits to meaningful business and customer relationship, through good and bad economic times. It can use capitol to increase service value through worker training or make new products that can help consumer better with their health. A lot of things can



happen, from this point. Through supply chain synchronization with web-base with customer, the gap of friendship barrier is also lessened between consumer and service retailer. From good service, a customer interviewed gave information regarding the kindness of service given to them, was assertive with care giving confidence that they continued taking.

*One of the subjects mentioned about kindness of service retail pharmacist and assisting clerk that every time she visited the store, consumer was treating with respect and honor and information given to them was assertive in action and professionally served. This gives her the confidence in using the product for her age-related memory and learning and resort from social anxieties from time to time.*

It can be seen as intellectual counseling that confidence was given consumer through actions of being professional to take care of consumers' health. This is good in long term because it values its customer and when happens repeatedly it increase service value of retail store. This keeps customer coming back to the store, because sometimes people do question themselves what professional advices do I have regarding my health needs. It is essential to all business when it comes to service and prevention of service recovery that can happen any time.

From this study, there were none that discontinued from pricing, so this means that the base price for bacopa extract has its strength in economical price. Also, customer power to bargain was also seen in retailing and e-commerce. It can be summarized that bottle price was continuously economic when taken pill price for effectiveness into consideration, it was still worth the purchase continually. The bottle price was fit to their lifestyle expenditures and supplement purchase. Bacopa extract pills were also effective and help other food supplements when taken together. Also, the travel expenditure did not affect the power to purchase for customers. This is different in other country where individuals have to travel uptown to purchase the products at the pharmacy, health retail store, the mall, or department stores. It might come from the fact that houses may be far from each other in a village, so bringing forth the needs to help themselves first. Although, in Thailand people in suburban areas tend to live near each other in cluster housing, so when one person goes up



town, a neighbor can ask to buy items in town for them. In metropolitan area, where there is city bus presented, the bus fare did not affect the power to purchase also.

**Please give reason why you continued to use the product, such as retail pricing and state if it is economical to use continually. Please provide details.**

With statement prior to this section, the price of bottle and pill was found satisfactory among subjects whom use the pill in short term and long term. Retail pricing within the study was found economical continually. They were asked at 5.83 baht per pill was economical and all agreed for the efficacy and continuation.

With other available standardized non-bacopa based herbal supplement for memory improvement at stores and e-commerce stores can cost up to \$0.60 per pill or around 21.6 baht per pill, this was found that bacopa was superior in cost-effectiveness. Although the herbal supplement was regard as Chinese herbal supplement that can help memory problem, similar to ginkgo extract that helps memory and cognition through different mechanism involved. Where advertised Chinese herbal supplement and Ginkgo extract seems to benefit brain function more than peripherals, where Bacopa had generalize benefits in central and peripheral functions of neurological system.

*The pill was affordable when taken only a tablet per day for the cost of about 6 baht per pill. Cost effective was felt when feeling healthier all day after taken the pill in the morning. The pill taken with mild tea stimulates your overall calmness and in a mood for general activity. When you drink tea and it stimulates your perception, sensory and movement. Bacopa adds the general clarity into that feeling. It was also cost less than a bag of tea for a morning start.*

A comment from a geriatric lady, was seen that Bacopa extract pills were cost-effective, and she generally enjoy taking it every day. It can be seen that the pills were effective and cost less than other pills that were non-extract form of other brands. Also, the standardize of the extract amount was effective for their conditions, when other non-extracted pills have to take more for the same effect. When asked about the continuation and shifting cost, many subjects agreed that continuation would be definitely and shift cost would not be present even though they almost ran

out of the pills and if at some point scarcity happened, they were willing to wait for the product or prevent from their use shortages for months period. Meaning that the bottle price was economical, enabling multiple purchase to stock their supplements when scarcity may happen in the near future.

Groups of customers in the lowest income range, in all age range, all agreed that the pill was economical in continuation for themselves, and for geriatrics at home. To compare the price at the level one can perceive how economical it was, is that it can be compare to “two and half day’s meal of food in metropolitan and big meals for country side”. This is tax add already, so it is economical and business were valued because of its economical pricing.

The customers whom were from Metropolitan, Metropolitan Suburbs, Provincial Urbans, Provincial Suburban, Countryside, totaled 1268 individuals, since all agreed that the price was economical for continuation. When ask further if they can afford any other supplements, some were already taking vitamins and mineral at times.

#### **Taking Supplements with Bacopa**

<b>Demographic</b>	<b>N</b>	<b>%</b>
<i>Metropolitan</i>	286	22.56
<i>Metropolitan Suburbs</i>	373	29.42
<i>Provincial Urbans</i>	108	8.52
<i>Provincial Suburban</i>	213	16.80
<i>Countryside</i>	288	22.71
<i>Total</i>	1268	

When ask the price of supplements taken with bacopa, variations were seen among people who were low income and high income. Low-income people were also able to purchase low-cost vitamins monthly when they feel the need. It was very informative when talk to elder about how they take their medicines and supplements. One geriatric female state that she usually takes multivitamin B with bacopa every morning to stay fit taking care of small children at home.

*Every morning when taking a glass of Ovaltine, a tablet of bacopa is taken with. When Ovaltine seems to retire during the afternoon, a small triangular pill of multivitamin B is taken for the tiresome on the days that daily activities were very active. Also, the multivitamin B helps her with appetite increase for the evening.*

With higher income people, certain dairy containing multivitamins and minerals can be seen with particular still active and bed-stayed geriatrics. Supplement dairy products were Ensure for geriatric health, Ensure Gold for geriatric with muscle weaknesses and muscle loss prevention, Glucerna for people with diabetic conditions, Aminoleban for people with liver problems. There were also other types of medical dairy products that were non-lactose containing and modified nutrition values to suit geriatric benefits.

Considerably, when viewing all accounts of other health supplements including medical nutritional food and subjects of lower income that takes nutrition-added food, at the beginning of the interviewed all were agreed that Bacopa extract was continuously affordable. Also, using Bacopa extract alone were shown in efficacy that some day when they don't take caffeine stimulant or vitamin B pills or nutrition-added food, there were no signs of weaknesses shown after an abrupt pause in nutritive supplements. Although, most continued to take vitamins when they were able to eat less food in most geriatrics that showed less appetite during retiring from a day.

In congruence with interviewed data of retired subjects' population, this shows that the retail pharmacy management has well studied of economic in their town demographic areas in private setting and Government retail setting. The continuation of supply chain shows good supply chain capability for customer to continue their buying. There wasn't any complaint as interviewed on availability and pricing of stock on shelf.

For people who were still working, from age 40 – 50 the price was reasonable for their spending and lifestyle. There were certain types of people whom their spending was found that there were no effect on purchasing power for single and married people, with their expenditure on their housing whether rent or own with

paying bank each month. All waged workers renting on in an apartment in Metropolitan with expenditure 4,600 – 6,800 baht range, still found Bacopa extract affordable.

*Every time when return and retired from the day of strenuous work and many electrolytes beverage taken throughout the day, meals with high protein diet and carbohydrate was served at dinner. In the morning, the tiredness won't go away from sleeplessness of mental stiffness and minor aches, Bacopa extract was consumed for these ailments and readiness for day work. It wasn't expensive at all when compared to multivitamins that were available on pharmacy counter, the price for Bacopa was 100 baht lower for expensive supplement imports.*

This can be seen that the price of Bacopa extract has no effect on purchasing power of singles living alone in an apartment. From lifestyle and working, the deterioration health of effect of people 40-50 years of this range, was minimized by Bacopa use. Although, examining the use of Bacopa extract among users, one interesting thing should be note is that people in the waged workers whom were in the lower income class workers also found the Bacopa extract affordable, when going to work and recovery from strenuous work. These people work in construction site and tend to stay together that doesn't require much spending on the housing, also with the money-saving apart from raising children, still have money available for purchasing Bacopa extract. Many of these people were people who grow up in countryside with knowledge of traditional medicine, as there weren't many pharmaceuticals available from earlier times. Traditional medicine has been used extensively and effectively from time to time, so the continuous purchase of Bacopa extract and adherence was seen in this group of people whom know more use of traditional medicine than people whom live in the city for a long time and were acquainted more with modern medicine.

*Bacopa was taken after dinner retiring from a day of strenuous work, it is well taken with meat and high content fat meal. This helps the ailments from repetitive moves and mental ailments from physically strenuous work that requires mind and body, similar to floor exercises but carrying 10-20 kilograms of granites and sand around the clock for 8-10 hours a day is very hard job. Sometimes, the rope pressing*

*on your palm like sandpaper makes your hand numb and sometimes the knees also weak, Bacopa extract aids in physical and mental recovery throughout months of jobs that has construction work to do.*

From this it was known that the site manager had taken the Bacopa before, and he told his worker about the effectiveness of the pill he was taken. The construction worker was known from his manager when the extract was referred as a good help to fatigue ailments among the workers whom work long hours for construction. Also, in a multiple construction site the workers sometimes have problem with sleep around the clock when returning late from another construction site. Bacopa was seen as cost-effective to prevent mental fatigue when taken with other mental stimulating vitamins supplements or pills. When ask about economical continuous purchase, the subject said that it was affordable. When he received the daily allowance from construction site, it was affordable for one day work allowance and still have money to buy 3 meals per day in Metropolitan. For one day strenuous work and purchase a bottle for 2 months use is very cost-effective. “It doesn’t affect his lunch money at all”, was said when interviewed.

**Please state problems you have prior purchasing the merchandise, such as taking long trips to purchase the merchandise.**

Some individuals whom were aging more than 70 years old that can take care of themselves usually travel to retail store by car and in suburban some travel by tuk-tuk motorcycle was also seen among users whom were able to travel and walk-in into pharmacies and health stores. It did not seem to be a problem for them and was enjoyable for some that were still healthy. Most of these people were low income for some who were not government workers, although living as a small family, some rely on family members that were still able to provide money at times, since they don’t require much on spending at retirement.

For these elderly people, in the suburbs they usually come up to town for purchases of groceries, sometimes they travel in group of elderly when there is still chance to enjoy conversation and travel together. In retail stores that were in small cities, it can be seen in faraway province and suburbs of metropolitan. In Bangkok, Siamese tuk-tuk can also be seen operating on the streets although less elderly were

seen since city bus would was cheaper alternatives to travel to retail store that has bacopa available.

In a small village setting, population within study still have their children and grandchildren living together. Also, in large cities setting there were non-geriatrics living alone. At times, when bottle almost empty if travel is impossible, they would have some people who gone to city buy it for them. If they can't go by themselves. This explains the ease of implications through societal lending help toward geriatric needs.

Although for most people with 60 years old and under, most people drive from home to get the bottles at the pharmacy, some when unavailable to travel place on-line orders and receive at home was convenient way of purchase. When ask how many people have purchased online, these were the numbers.

<b>Demographic</b>	<b>n</b>	<b>%</b>
<b><i>Metropolitan</i></b>	286	22.56
<b><i>Metropolitan Suburbs</i></b>	373	29.42
<b><i>Provincial Urbans</i></b>	108	8.52
<b><i>Provincial Suburban</i></b>	213	16.80
<b><i>Countryside</i></b>	288	22.71
<b><i>Total</i></b>	1268	

Metropolitan geriatrics age less than 70 years old most people still can walk and go on buses for commutation. Some people came to buy many bottles for their siblings and other people at home, still find locomotion were ease of use. Also, the seats and buildings with elevators were ease of use for geriatrics.

*The way of getting around town with city bus and trains were ease of use when going out, however masks were worn all the time to prevent COVID transmission, since it is mutating and there was no alternative ways of prevention.*

This can be seen that the willingness of people of good adherence can be seen travelling around town to get the product they need. It gives confidence in retail and manufacturing that their product has continuous customer. Continuous efficacy give



rise to needs for continuous use. The elimination of health problems was seen in individuals that can still travel.

With living in suburbs where GPO bacopa isn't available competitor brand were sparingly available. It was found that retailer that doesn't have GPO Bacopa customer, tends to have competitive brand more available when other customer was purchasing from time to time. It was found that years before the government legislation put on retail pharmacy that it must have pharmacist operate during opening hours. There wasn't much worker who can give item information to customer. Also, when clerks whom were more acquaint with one product, they seem to sell certain products more than the other. Also, some retail pharmacy selection of item into pharmacy was also another factor that GPO Bacopa wasn't on shelf, as it was seen that the product from competitor's brand wasn't different from first launch GPO Brand that wasn't the extract version. This might be one factor that may have affect product availability for the customer, that is causing them to find which retail pharmacy has the product they need. As it can be found in some customer whom had to travel to other retail for the purchase of GPO Bacopa.

*The time to travel from suburban Pathum Thani to town was quite problematic, it had been a length of 48 kilometers into metropolitan area. There were buses at Sala available on the highway to the Metropolitan and another available route was the City Van that can be a short haul for a bit less than 60 baht. Although, another Van had to be taken for 30 baht that takes passenger to the center of metropolitan, from there on a small city bus can be taken to front of the retail for a small sum of money. However, purchase multiple bottle it would be worth the trip.*

From this it can be seen that round trip for people whom lived in suburbs where Bacopa extract wasn't available for purchase can use money up to 350 baht for a round-trip. So, when they purchase more than 3 bottle, it was worth the use for more than 6 months. This was seen as saving when asked after the reason if they feel satisfy with pricing.

From one subject, raised questions on others subjects too. So, when asked people in terms of wait time for the travel. From people living in the metropolitan, 286 out of 1268 said usually around 2 ½ hours. The length of trip varied throughout customer whom came to purchase the bacopa at store. There was case where customer living in between the two retail store. Although each store seems to have stock their retail item very well and no scarcity were found among the groups asked. There was no difference on the length of kilometers need to reach the retail store but the bus route can take very long time depending on the traffic usage. So, any bus taken route would be quicker than the usual two and a half hours on average round-trip of metropolitans asked.

Problems with long trips may also come from non-permanent commotions that were going on in the streets such as city parades, school parades, and anti-government party strikes. These may happen during any time and causes long traffic jam for months. Also, when a street is being repair in some area, a longer travel time for city buses and cars were expected.

*One of the metropolitan ladies in the interviewed told, a day month that has commotions on the street, whether it is traditional or non-traditional on special occasions, traffic usually gets jammed and the best thing to avoid is to purchase multiple bottles. However, the bus can be taken to buy the bottles at the retail store. It usually takes no more than 4 hours, if got stuck during the street repair and worse if thunderstorm occurs.*

During the season that can cause seasonal weather traffic jammed, among geriatrics in these group tend to have more than 1 bottle stock at home, for the base price wasn't barrier for them to secure multiple bottle purchases. The difference in working class and retired class were not different through their living in metropolitan. Modes of transportation commonly seen among waged workers were motor bicycle and small cars. However, most workers at an industrial site where a nearby pharmacy can be pick up at the street, have no problems reaching the pharmacy that they purchase. It is similar to an ideation of patronage where retail pharmacy has become a part of their live growing up, going to work, and retail pharmacy was part of their life's journey, or part of their journey during their youthful day that hadn't change

from industrial worker stage. Among the lower income class of people, the way they work out their expenditures for travel or communicate with retail for product of interest has not become a problem of reaching GPO bacopa extract. This comes to sense that Thais were intelligent about their expenditures and frugality. In Metropolitan, there are a lot of retail pharmacy available throughout department stores and along the street walk, it isn't hard to find retail pharmacy available for getting bacopa. However, when concentrating on the people whom lived near GPO retail branch, subjects tend to use car, city bus, or have people at home purchase for them. This can account for 45% of all purchases by metropolitans.

#### **Retail and distributors that were non-GPO retail**

<b>Modes of Transportation</b>	<i>Countryside</i>			<i>Provincial Suburbs</i>			<i>Provincial</i>		
	n	std	%	n	std	%	n	std	%
<b>Motorcycle</b>	137	52.13	47.57	81		38.03	53	32.66	49.07
<b>City Bus</b>	86		29.86	27		12.68	3		2.78
<b>Hired Tuk-Tuk</b>	15		5.21	23		10.80	5		4.63
<b>Car</b>	50		17.36	82		38.50	57		52.78
<b>Total</b>	288			213			108		

This can be compared to subjects whom were living in the suburbs and metropolitans, where more transportation services and the messenger service becoming more prominent in the capitol city area and business areas. The number of people taking routes to retail branch and non-GPO retailer seems to digress with their monthly income for each mode of transportation.

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### GPO Retail Branch

Modes of Transportation	<i>metropolis suburbs</i>		<i>Metropolis</i>	
	n	%	n	%
<b>Nearest Walk</b>	18	4.83	14	4.90
<b>Metropolitan Bus</b>	38	10.19	72	25.17
<b>Hired Tuk-Tuk</b>	34	9.12	28	9.79
<b>Motorcycle</b>	156	41.82	114	39.86
<b>Car</b>	115	30.83	32	11.19
<b>Messenger Service</b>	12	3.22	26	9.09
<b>Total</b>	<b>373</b>		<b>286</b>	

It is normal to see elder whom take the car, some of the geriatrics get to retail through grandchildren's parent when they go pick up kids at school. It was convenient for people whom lived in the metropolitan. The metropolitan wasn't hard to get around town, and during the weekends on some part of the streets there weren't any cars at all.

On the days in the month that took too long for traffic to pick up the grandchildren, one state that buying more bottles just to eliminate problems that can brought more fuel charges. This was seen in a geriatric group that still live with their children and grandchildren, 11 in numbers. This happens sometimes when their bottle reaching the end during school days and they don't have time during the week days, and they need to get more to benefit their health.

However out of these 11 when further questioned, some of them when they don't feel like travel, their children may pick up the bottle for them at the store. This may come from the fact that they might be doing a lot of things that causes tiredness, as seen in many young geriatrics that tends to be more active when they are retired. They can do things that they want to do, when they don't have time during youthful days working to save money. Many of them were into gardening, cooking, and taking care of very young grandchildren so they can't leave home. It was a lot of certain problems that was barrier for them to reach the pharmacy themselves. However, when

problem arises that they need to seek pharmacist or help they would go in person to retail pharmacy or clinics. Many of these individuals also were custom to herbalist retail store and a herbal practitioner clinic. So, this may pave way for Bacopa extract to have a place in such retail and herbal clinic practitioner setting.

Traffic jam was seen as barrier to reach retail pharmacy on time before it closes, although change of retail pharmacy for product purchase was seen among the subjects when interviewed of numbers of retailer available for change of service. This recur among the subjects 40-50 found 12%, 16% among 50-60, and the rest percentage from 40-80 in particular they usually go to pharmacy that they were acquainted to for service. When interviewed, the reason for going to the same pharmacy is because they were provided with what they need for continuous use. Also, geriatrics they had pharmacy that

On barriers that were non transportation, there were rush hours that can't make purchase within time in some retail, even parking a car near the sidewalks could create traffic slow. Although can't be prevented, during rush hours most metropolitan avoid the problems. They see purchasing through on-line channel as an alternative if their schedule were really busy. Sometimes, people whom were acquainted to mobile service use tend to use messenger service to alleviates their busy schedule. This was seen in people who has busy jobs and in managerial job functions. Around 26 people were using messenger service that were available in their area. This was account for 0.02% for total number of subjects or 0.09% for metropolitan subjects only, using messenger service to avoid traffic jams and reduce their schedule during the day.

For subjects whom were motorcyclist, it seems that getting through traffic jam were a lot easy and there was no problem on getting to retail store, both metropolitan and suburbs answer the same that there were no problems getting to store even on traffic jams time. Although, for motorcyclist in the provincial suburbs and countryside, they have problems of travel a long time from village to town, the longest distance was 12 kilometers. Most subjects were aware that travelling long distance were prone to accidents or motorcycle stop working that can happen, so no subjects were seen travelling more than this distance and prefer using city bus instead. Many towns have city bus that goes to capitol city of each province, at the site of bus

stop there's usually retail pharmacy nearby the bus stop. Informative number of people can be seen in the two tables regarding method of commuting.

**Please explain how do you feel about the pricing and cost effectiveness of the pill.**

Base pricing was good and satisfactory in groups interviewed and observed. 5.83 baht among 1286 subjects, low income said it was affordable continuously but the price was moderately affordable in a sense, their earning was a bit less than 500 baht per day. Total number agree to moderately affordable was seen in 214 single subjects with low-income, less than 10000 per month. Although, when they were asking about scarcity in the future of increase number people in use, they would buy three bottles if they have the opportunity. So, this affirms that in a short burst of increase market use, a need for synchronization is need to prevent product shortages in market. When a low-income people have the power to purchase, it can predict market shortages when increase use begins. These were waged workers whom usually use their physical strength to earn money. While, moderate and high income said it was very affordable and tend to buy more than 1 bottle if found that their schedules would be busy during the next month or beyond. These were people whom were married and have low income, a total of 252 people said it was very affordable. Agreeing with the rest married people, 802 subjects that the product was very affordable regardless of raising a child or children at home.

5.83 baht among 286 metropolitans and 5.83 baht among 382 for metropolitan suburban found that the bottle was easily affordable in similar with married low-income family and high-income family. It seems that marriage makes life easier for marriage couple, with lower cost of housing, less tax was accounted for, and children doesn't require much spending. Also, the government policy of digital money giving to people in the enable low-income and mid-range income people to save money for other things such as buying bacopa with their wage from jobs. The policy was in the year 2563 B.E. Also, the current time this year 2567 B.E., there has been another digital money policy that would help people with their economy. This will enable another sum of money that can enable purchase with the same low-income



group and low-income marriage group. So, a continuous prediction can be made when use government policy to predict market gains. In another group of 256 individuals living in provincials and 344 people in countryside also agree that 5.83 baht per pill was economical. With lower expenditure on lifestyle was seen that low-income people in provincials and countryside enable savings due to less need for travel to work, expenditures on goods and services that metropolitan have to offer.

*The pricing on the bottle was not bad at all, it is the only supplement that can help with memory with knowing that amount in each tablet was the same in efficacy, 5 baht seems to be worth enough that you don't have to take another pill if you don't feel like usual days. It's the quality in each pill that makes me confident about myself and the brand I'm using for my health. Childrens were happy to see me feel better than before.*

*Another lady said when taken together with pain medicine, it helps with her anxiety and improves her feelings. She also learns better when earlier time she tends to forget and her momentarily dullness was improved. 5 baht per pill per day was economical all year round, although it has to be paused sometime so it can be taken again. Although she knew that it was safe to take more than 6-month time for adults.*

The cost effectiveness was good at 5.83 baht per pill, observation among 1286 subjects, low income and high income agreed with very good level of cost effectiveness when the tablet was in extracted standardized form. They were very satisfied with the results from taking pills in long term, a minimal improvement every day over time enable them to think back and compare to current health. The ability for them to perform better in tiredness, ability to physically perform, thinking and less anxiety were main purpose of people in purchases with awareness of cost effectiveness. Numbers of people in the suburbs and metropolitan weren't different much compare 286 metropolitans to 382 for suburban. In these people also sees the cost effectiveness was very satisfied, it was found that people in the suburban sometime had to get up earlier in the morning to travel to work in town, anxiety was common among these people, totaled up to 278 people, when they have to rush every morning to work. Some people in these group had to hover many buses stops to work and sleep early when arrive home. Sometimes, when work isn't finish on time it

drives them sleepless to get things done. These were common among the trainees that were waged worker and carrying jobs also as strategic planners. Among 256 for provincials, bacopa was cost-effective for people who were in government officials that requires a lot of memory and learning, as well as geriatrics living in the provincial area. Summarizing, waged workers, managerial workers, and self-employed people whom requires memory, learning, and communication in their job tends to take bacopa for anxiety and daily performance of thinking and communication. This was very crucial in reason why it was used extensively and continuously among the needed. In population of 344 individuals in countryside, also were people waged workers in construction, government offices. Of these 344 individuals, there were also people who were farmers, and geriatrics living among countryside villages with small children and family. Among these, there were continuous purchase and use daily among the group. Cost-effectiveness when interviewed all agreed to low price factor that was economical and effective. The cost per pill was not considerably high for less than 6-baht range.

*There was one among they group humorously mentioned that a low-cost insurance for less than 10 baht per day was affordable among geriatrics ages ago, bacopa extract is like an insurance of every day that I will remember today and continue with tomorrow activities.*

*Another add that her lifestyle expenditure apart from normal meals, having some money left for spending less than 10 baht was able to buy bacopa, vitamins enough for a day, and still have money for digestives. Current medicines were very cheap in Thailand and it leave room for supplement to be purchase.*

This can be seen that the pricing of medicines and supplements were modest and studied by marketeers and retail economist. Also, the cost effectiveness was very good for continuous use. If modern medicines were used, for people with anxiety and attention deficit disorders one drug tablet may cost up to 750 baht per pill per day. The action of bacopa also see improvement in learning and memory, this also adds up to its superior effectiveness over other types of supplements with a very low maintenance cost for each day.

Multiple purchase saving observation 3 bottle with retail discount 50 baht, were seen in retails outside of metropolitan in provincial and countryside. It was seen as a common discount similar in other retail stores where they attract customer and help customer with economical purchases, so there's money left to buy other things. It is a form of promotional pricing that non-government retail can give to their customers and the retail can earn money from other customer's expenditures also. This was seen as promotional pricing for common stores, the 50-baht reduction wasn't seen all store but discounts of 20 baht or more was seen for multiple purchase than 3 bottles or more. The discount varied from stores to stores, with their policy planning for each quartile. The interviewed customer in lower income and moderate-income range feel satisfies with the discounts for multiple bottles. Bacopa extract was low cost for low income, multiple purchase of 3 for each trip was seen in the low-income group, it was perceive as saving on important and it was very cost-effective for their condition, that current pharmaceuticals may cost up to 800 baht per pill for the treatment of disease or conditions that bacopa can alleviates. The spending didn't affect their lifestyles every day, also it helps them to perform daily jobs better with good mental health, better cognition, memory, and learning. For people who has higher income they feel satisfy with the pricing. Two groups agreed it bring down cost a little bit, the pill cost less around 5.5 baht. However, subjects were happy because with discount saving, they can use to spend on other things. Although, from this interviewed it was record for account of 14% of people whom received discounts, in the web review was entered first bottle purchase on the first week for every first week of two months interval.

*Living in the provincial and countryside, when the promotion saves you 50 baht, sometimes you take it because if you are single and living alone, the 50 baht you can live a whole day by making your own meal. If 50 baht wasn't spent on food but for fuel, it can get you to work for 4 days.*

*Another adds that, from discount 20-50 baht saving, they could save for the next bottle when necessary for long term use when supplies could get short by any means of disruption that can happen. They were also aware that pandemic vaccines some can cause memory problems, so supplies of bacopa extract and ginkgo extract*

*could get short suddenly. The 50-baht discount would mean a lot to them in the future for purchasing.*

For people in the metropolitan and metropolitan suburbs, for low income the cost-effectiveness was seen very satisfactory. But stores with discounts less than 50 baht was seen less prominent. Since it was either perceived as low price already or the retail operating factors may not be economical for discount promotion in some retail. The 50-baht discount was seen more in provincial, provincial suburbs, and small towns in countryside. Although, from the interviewed customer, it was seen that metropolitan and metropolitan suburban retailers' owner give customer discounts at times. Most customer purchase at the retail pharmacy near their house or renting apartment. The cost-effective was similar to provincials and countryside. For high income people, they don't see the discount as important thing, they tend to buy multiple bottles of 3 or 6 bottle for a whole year. There wasn't any option available better than bacopa extract that enter the new market. So, purchasing a multiple of 3 to save up for travel cost would be more saving than 50-baht discount to reach a retail store with available product at any time. Also, purchasing of 6 bottles would secure item for use for the whole year and they don't have to worry it about it for a year was a good option for the current decision. For 50-baht discount or less for bottles of 3 was so-so for them. Bacopa was very low cost for high income and long-term purchase and 6 bottle were seen for most people, account for 6.84%. However, no more was seen since it seems to be much for self-use or small family. Nuclear family has very good value of purchase for geriatrics people in 1 to 2 generations of people. The Chinese people whom lived together tend to buy more and was seen purchasing from online webservice from GPO. These number were very small, make up of 0.53% in 6.84% mentioned. The reason why they bought from online retail is because it was convenient for them to wait at home and wait for the delivery and they don't have to revisit the retail GPO pharmacy store when they don't need to speak with clerk or pharmacist. All of benefits, education, and long-term use were explained and consulted.

Everyday effectiveness in aids in ailment improvements, observation in efficacy was not differ for people whom take it in the morning or in the evening,

regardless of age and gender difference. There was no difference efficacy in geriatrics stiffness at home and people whom uses body for strenuous work recovery. The cost was very low for effectiveness appraise. 5 baht per pill was good price that can bring more functional to their physiquess and mental health. Sustainable outcome of efficacy in people who were in planning and mental stress prominent. It shows long term cost-effectiveness in mental improvement and recovery. With information regards to this, makes cost-effectiveness more satisfactory when some of their functions were fulfilled with more of youthfulness function of the mental perception and cognition capability. It was seen in an interview that people who were forgetful were also effective in action of memory and learning. Their niece also takes it when she had examination this was seen among some family who had teenagers whom were older than 18 years old. Taking bacopa during university entrance examination also helps with mental stress and cognition. Although, in ayurvedic study age less than 15 years were examined for long term safety and was found safe in a non-exceeding regular amount in the age.

*A geriatric lady said they bought a bottle of three and one of them was given to a niece for her learning and memory. I took them every day and it is working for me; I don't forget things like before and my anxiety as a geriatric also goes away. My anxiety also goes away when I see my niece taking it and makes her cognitions and calmness better. Relief of anxiety of my niece and social life were good throughout the use of bacopa extract. I am very happy of my mental health and prevention of memory deficits.*

From this interview, it may be important for managers to work together that can plan marketing or prevention of supply chain disruption after marketing successfulness or increasing use in geriatrics and waged workers. However, the usage might not be long term like geriatrics and stressed individuals. But short-term usage among young adults entering and studying in college may be new factor crucial to supply chain resilienceness. As effectiveness in medicine has confirmed help in anxiety, memory and learning, and attention deficit disorder in teenagers in last few years. Also, individuals in the interview also notes less anxiety when taken the pill long term, they also note calmness and less anxiety. There were people whom taken



bacopa extract as medical news refer the ayurvedic can help prevent Alzheimer and help learning with good memory. Among the stressed worker and managerial position, 89% and 92% were agree to cost-effectiveness for their mental conditions and improvements. The rest had result of sustained but no progression of severity was seen.

Cost effectiveness observation in lower and higher educated group were the same, both groups have the ability to read and comprehend domestic language at good level. They were able to read, write, and understand what the clerks have educate them. They mentioned effectiveness of bacopa as the ability to recall what they've learn was better. These population mention it was cheap and cost-effective in handling their moods and learning every day for people over 60 years old, regardless of age and gender. This accounts for 17.82% of total population in the study. For uneducated people, their memory and learning were also better when they listen to radios and watch television. The ability to recall information from news and listening were a lot better than before, seen in 128 subjects interviewed, or 2.4% in this study.

Conjunction use with vitamin for peripheral neurological enhancement is economical continually for people whom were retired low-cost continuation in maintenance dose of supplementary vitamins were seen with low cost bacopa extract, combined effectiveness was seen with mental alertness, less anxiety, and better memory recall. Observation was seen among low income, lower than 20,000 baht, or 58.83% population and income higher than 20,000 baht per month, 41.17% population. There was no difference in observation that bacopa efficacy was less in long term users within populations in low education and high education. Interview questions involved cognition, perception, and memory ability to perform every day activities and learn new things without forgetting was seen. Since, their age was more than 60 years old and retired, questions regard ability to recall and learn new things from the point of their knowledge for uneducated people seen no deficits. Also, in educated people the ability to continue learning and memorizing also improved in their field of education and knowledge that can be use for increase cognition and perception in new knowledge was acknowledge without deficits. So, the cost-effectiveness was seen in this population, no complaint was seen from pricing of 5-6



baht interviewed. Positive price appraisal was seen indicating that 350-baht bottle was not detrimental to their savings and earnings.

Conjunction use with vitamin for peripheral neurological enhancement is economical continually whom were in work force that stress and strenuous activities were seen in work days. Both low income and high income has no complaints on the cost and results were highly satisfied with 5.83-baht cost-effectiveness and deemed 5.83 baht was fair price and economical for them in continuance need for the low-income people in workforce regardless of gender and age. Among the uneducated, low educated, and high educated people, were satisfied with cost-effectiveness on the calculated 5.83-baht price per pill. From this information, it can be summarized that these populations may be exhausted in the waged workers with low income and geriatrics may be in a progression into more moderate severity in conditions that they were having, from inquiring information of dual use supplements in their daily consumption. This may be important for retailer to notify manufacturers for changes in supplement formula to suit consumers in the future.

<b>Demographic</b>	<b>N</b>	<b>%</b>
<i>Metropolitan</i>	286	22.56
<i>Metropolitan Suburbs</i>	373	29.42
<i>Provincial Urbans</i>	108	8.52
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**Were you thoroughly satisfied with pricing, cost effectiveness, and the economical pricing of the pill long term?**

Informative data were given in prior category, the baseline pricing was satisfactory in all income class, both working and retired subjects. In this section, economical pricing of multiple bottle purchase for long-term use would be examined. It is found that subjects those were people with lower income group of,

lower than 15,000 baht per month, were satisfactory with multiple purchase of 3 bottles for half a year use. It is also observed with median income group of >15,000 baht to 25,000 baht that the pricing was satisfactory pricing of cost-effective, with or without discount promotion given. It was observed among individuals of two income group that who were living far from city area and provincial suburbs where they don't have to travel often to town, multiple purchase was a saving for them. Also, a definite bottle purchase of 3 would be more appropriate for them if their work schedule will have more duties in the future. From the interviewed, many subjects were private companies' workers, their functions require strenuous work. When more work will be given to them, that weren't people who was laid off, a bottle of 3 would be a wiser decision as they would need more time to rest and recover. The price of long-term use when purchase for bottle of 3 was also found cost-effective for their conditions, the recovery of physical ailments and mental stamina was effective in strenuous waged workers and the cost of 1000 – 1050 baht was economical for long term 3 months use, similar to timing of modern pharmaceutical treatment where more than 3 months use was considering a chronic use. Among these low income to mid income people, total of 1148 subjects were satisfied with pricing for long term use and deemed cost-effectiveness satisfactory. This accounts for 90.54% of totaled subjects.

People with higher income also satisfactory with multiple purchase of 3 and 6. A purchase of 6 were seen in more geriatrics at home and prevent from shortages of bacopa so that there is amount available for use. Their satisfaction was regardless of discount promotion given. From the interviewed the expense didn't come from rational thinking on given monthly salary basis, it was from their savings alone.

*When I purchase bacopa for 6 bottles, I didn't think about the earning from salary. It was from my savings and sees the purchase as necessity to procure use for my health. Which the supplement is effective and cheap for my memory impairment and calms my anxieties.*

It is seen that in higher income people their spending was available at all times for bacopa use and also it was found that similar patterns of spending were readily for people in mid-range income group that have savings from their employment years after bachelor's degree graduation. This account for 523 people or 41.25% of total subjects. Under these groups, were self-employed, executives, government employees, and managerial.

The long-term cost effectiveness was seen as satisfactory for all income group of 3- and 6-months use, after purchased bottle of 3 for use, at pacing 1 bottle for every two months or 3 bottle at once.

*The bottle was available at the retail pharmacy at all time for purchasing, so there's no hurry to buy more items unless there's a warning bell in news for its shortages. If there's shortages of items on shelf, there's also non-extract capsules available. It is also effective for mild conditions that I have from fatigue and stressful work. However, the GPO brand was more economical than another brand.*

Mentioned was from lower income group people whom bought 1 to 2 bottles at a time for their conditions, these were waged workers with salary range more than 5000 – 10000 baht. Locality of these people were provincial and suburbs of provincial, and suburbs of metropolitan. The affordability of their lifestyles was not affected by expenditures bacopa purchases. Moreover, the housing environment of these people may be different but doesn't affect purchasing power, meaning that salary abruptly more than 5000 baht to near 10,000 baht may have housing provided by private companies that were employer. For people with mid-range salary was seen in metropolitan and provincial area, where there some of their salaries were spent on housing and rentals, which pocket cash money for lifestyle expenditure were similar to people whom were waged workers in metropolitan and metropolitan-suburban. So, this summarize that power to purchase for wage workers among low income and mid-range income were similar and purchasing power for 3 bottle was affordable in long term, although at current time some subjects purchase one at a time for the mild conditions but continue the benefits from bacopa for their health.

The cost effectiveness for 6 months use was satisfactory seeing results for working class. The continuous benefits and effectiveness were still seen. 32 subjects from the lower income group had purchase 3 bottles for 6 months use, these were formerly users of bacopa capsules before the extracted form came out. Waged workers 48 subjects and 12 subjects from managerial group were in the mid-range income group that purchase 3 bottles for 6 months use. This accounts for 26.14% of all participants in waged worker and managerial group, or 7.3% in total population. The total spent 1050 baht for coverage of 6 months use was satisfactory in this population, the effectiveness was sustained and improved in physical and mental functioning.

*It is better when you take the pill than taking nothing at all. Mental functioning at work and returning home makes you feel less tired and able to think of things on the way back home from work. Less anxiety from work was also one of the factors benefits from bacopa, when stress makes things easier to forget. Bacopa helps prevent that and helps you learn new things without forgetting.*

It has been in medical studies that stress and sleeplessness does affect memories, so with bacopa effect lessening the stress and anxiety, the effectiveness on memory is improved and cost effectiveness for long term is considerably good for all subjects interviewed. Comparing to current pharmaceuticals is that cost 162000 baht per 6 months for the regimen that may benefit patient, with dosing similar to bacopa. This proves that bacopa extract cost only fractional, so it is considered best choice in cost-effectiveness a consumer may afford for long term use.

The cost effective for 6 months use was satisfactory for retired individual and with conditions, it was seen that 5 baht were improving them from the first week of continuous use, it is seen in individuals whom use bacopa alone and already taking vitamins subjects. Although, vitamins were variety ranging from mono active ingredients and multiple active ingredient vitamins.

Conditions	N	%
<i>Memory and learning were continuously improved</i>	886	69.87
<i>Anxiousness was decrease</i>	1124	88.64
<i>Improve mental state and cognition</i>	983	77.52
<i>Forgetfulness tends to decrease with mental clarity improve</i>	506	39.91
<b>Total</b>	1268	

Subjects portrayed some have mild cognition and memory problems, all were effective in low cost of less than 6-baht maintenance dosing of supplements. It was seen as effective alone and effective together with multivitamins supplement for their conditions. Multivitamins regard as stimulatory and body function improvements, while bacopa extract were for everyday mnemonics, stress, and anxiety. This accounts for 27.82% in population, or 352 subjects involved.

The cost effective for 6 months use was satisfactory for geriatrics with conditions that were fatigue, stress, and tiresome. All were cost-effective for their conditions of chronic mental fatigue, forgetfulness, and stress. Better perception, memory and learning were enhanced by long term use when interviewed. The retired group have better memory function, forgetfulness decreased, anxiousness decrease for anxiety, weaknesses and movements were better. It was economical for them to sustain the supplement use without affecting their retired lifestyles and medical bills in some subjects. Some see it as prevention supplement and prolong the time to go to hospital for cognition and memory impairment.

*I take the bacopa everyday as the clerk and pharmacist directed. It is for prevention of cognitive impairment and memory. I see people with memory impairment and Alzheimer was very scary to see people lose memory from aging and bacopa has help me with anxiety and better recall. I hope that bacopa will help me prevent memory deficits in future years of living.*

The answer given on the interview has portray hopes and fears of memory deficits in aging and Alzheimer. Geriatric bacopa users, some came from self-refer, receiving supplement as a gift, medical news information, and pharmacy counseling.

The bacopa was economical in all subjects. It's continuous use for 6 months observed for also economical for income earnings in low income and high-income subjects, both in retired people. High income subjects.

Economical continuous use for longer than 6 months observed for regional study. It was seen that the pricing of 1050 baht per 6 months was economical and cost-effective in helping mental functioning, reduce anxiety and stress. All subjects were agreed that 6 months of use purchased supplies were cost-effective. The expense didn't not affect their lifestyle expenditures and daily expense on living. Some said that

*The bacopa extract was helping them save money, as some retail store has bacopa capsule pricing higher than the extract. It is very low price and cost-effective for me because the competitor's brand were 100 baht more expensive.*

When compared 450-baht non-extract and 350 extract, it was seen that the GPO bacopa was more affordable and more cost-effective in low price. Metropolitan, Metropolitan suburbs, Provincial urbans, Provincial suburban, and Countryside were agreed to GPO bacopa was more affordable and continuous effectiveness of every pill was deemed cost-effective when it was able to provide same outcome of controlling the anxiety and increase in memory and cognition in a 6 months period. This account for all retired individuals in the study.

**Would you regard the product as essential item for long term use? Please state why do you think so?**

The diseased and deteriorating health condition people sees severity lessened with very low cost on supplement. The cost effectiveness for 6 months use was satisfactory, seeing results for working class, retired, and self-employed people. Every subject in the group sees the product as an essential long term use product, when they all start the product and see it helping. Incremental changes were observed among the stressed from work and weariness from aging. The gradual of overcoming anxiety and memory learning was observed from asking if subjects can recall certain thing in their



life or learning new things, this was seen in retired people. Do they understand clerk and recall product usage, all were able to answer correctly for their current and future health. Things to watch for long term use as the body may gradually change while aging with bacopa consumption.

It was essential to their health because it is helping them preventing deterioration and restoring memory and lessen anxiety. Also, the cost effectiveness was very low, so it serves as a preliminary supplement for them before taking other supplements to increase their wellbeing. Diseased and condition severity were cost effective for 6 months. This use was satisfactory for improved health and mental functioning in retired individual and with conditions.

From the fact that memory and learning were continuously improved, anxiousness was decrease from overall wellbeing of mental state and cognition, forgetfulness tends to decrease while mental clarity was increase during the day. The cost effective for 6 months use was satisfactory for geriatrics with conditions. Memory and learning were enhanced, Forgetfulness was decreased, Epileptic episode and movements were better, Anxiousness were decreased among retired subjects. While geriatric sees it as maintaining health and balance, the retired people see them as nutritional supplement in gaining memory and prevention of mental conditions when it hasn't start yet. Geriatrics and retired subjects see it as supplements require for everyday functioning also when they feel the need for continuous improvement in mental functioning that their health is worn off by aging. The cost effective received much satisfactory and economical for continuance in lower income and higher income group of retired subjects were the same for 1050-baht pricing of 3 bottles. Longer expenditure proves important memory learning and mental clarity, bacopa extract was effective in prolonging its effectiveness overtime. It was agreed in non-retired and retired subjects that bacopa pricing was economical in long term use, about 175 baht per month.

Surveyed interviewed, showed continuous was economical for longer 6 months, observed in income earnings in low- and high-income group. This means that it doesn't affect their monthly spending much and it was improving their health daily in working class.

Regionally, it was also economical continuous use for longer than 6 months observed in regional study metropolitan, metropolitan suburbs, provincial urbans, Provincial suburban, and Countryside. Considerably, 175 baht per month was very cheap for them. The pricing of this was similar to high quality vitamin B complex brand but a bit lower. But with deteriorating health, when they bought bacopa it was reasonable pricing with the effect that they get.

All groups of working class in waged worker, government, and self-employed people would use it in long term essentially because of their health deterioration, mnemonics, learning, and mental clarity for everyday activities.

*It very important to have good memory and every day clarity when you are self-employed and being able to communicate with customers. If you can't remember every detail of the product selling, customer may not purchase it at all.*

Others add that “when *retailing certain products with promotion, remembering promotion help selling better and keeping up with competitor's product, the ability to learn and memorize the pros and cons of the product you are selling and competitor's product, requires a lot of memory and learning. Bacopa helps in memory learning and anxiety, it helps a lot through the stressful days. It gives more control of self-feeling without anxiety and better memory to work out with customers.*

This was account for 561 People in the study, from managerial, executives, self-employed business owners, and government officials of several ranks in managerial positions. It was conclusive that it was essential to them to maintain their focus on work and strategic planning for their job function, as self-employed work planning, managerial planning. The reason for essential was memory learning and anxiety. This creates long term stress that also harbors forgetfulness. Some of these also takes for prevention of diseases from medical news hearing. It was perceived as extra benefits for taking bacopa extracts.

When long term was in use, other data that was important in continuous use was Safety data for Bacopa extract continuation. It was seen safe for adult use and teenage use in mid teenage years or more. Long term studies in adulthood were continued for 1 year and was safe for the supplement, for teenage years some studies

found safe use for 6 months and low blood pressure was observed. Although, the results can be use as precaution but larger trials may be need to confirm such findings, the findings may be new evidence that needs more research. It was known for fact that clerks do notice the precautions of this herb in the study, so continuation for longer may be continue with a pause for long term effects. In medical term, this can be considered as “wash period” or cleanse period for the long-term usage, the ability for the body to re-balance itself before next continuance.

In retired people and mild memory deficit conditions, it was considered essential for long term use because their conditions were deteriorating and not sustain for 12 % of people from 1268 subjects. Of these people feel the need to control their chronic condition and prevention of future deterioration. They also have mental stress and anxiety about their conditions. After uses of bacopa for several months, their vitality and mental conditions were better, so they see it as a need for continuance so their conditions don't get worse. In these people, clerks and pharmacist also remind and educate them on how to use the product, they were also adhering to use and remember long term precautions correctly.

In small population of behavior-center subjects, in continuance of long-term use, people whom were self-refer was seen that there were many ayurvedic medicine and modern medicine that studies usage of bacopa extract for about a year on chronic effect, found memory enhancement. This population was seen as people whom heal themselves, with this conscious in mind, they were also more adhere to use on a daily basis. They also knew that prolong use may need to be pause for a period of time, after a one-year use and continued later, as a safety precaution for ayurvedic medicines advise from self-educated about herbal supplement information from various source.

Examining the knowledge of subjects on product benefits and education, it was found in all educated class and non-educated class that continual use was economical when thoroughly thought of cost-effectiveness and everyday effectiveness received.

<b>Demographic</b>	<b>N</b>	<b>%</b>
<i>Metropolitan</i>	286	22.56
<i>Metropolitan Suburbs</i>	373	29.42
<i>Provincial Urbans</i>	108	8.52
<i>Provincial Suburban</i>	213	16.80
<i>Countryside</i>	288	22.71
<i>Total</i>	1268	

<b>Essential Long-Term use</b>	<b>N</b>	<b>%</b>
<i>Chronic disease</i>	418	32.97
<i>Chronic health condition</i>	786	61.99
<i>Prevention of deteriorating health</i>	682	53.79
<i>Mental stress and anxiety</i>	1124	88.64
<i>Work planning, memory, learning</i>	561	44.24
<i>Mental disease prevention</i>	227	17.90
<i>Number of Subjects</i>	1268	

**Will you be using the item in the next 10 years with incremental increase in pricing from inflation, at the range to 10% due to inflation and fluctuations in manufacturing and retail services?**

Along with economical pricing enables continuous use for all subjects that use bacopa for longer 6 months, observed for income earnings of low income, mid-range income, and high income show no difference in opinion in interviewed. If price increase 10% within the next 10 years, bottle price up to 385 baht per bottle or pill cost of 192 baht per month would still be economical for them to buy continuously. Although if retail operations cause price change larger than affordability, many answer that they would resort to online purchasing if it is lower than retail stores or

find store that has discount price or good promotions for them. Later, interviewed it was found that price changes up to 455 baht may shift their service from retail to online. It was the same cost as the competitor's pricing, so this was the reasonable baseline for changing retail service for people with low income and mid-range income. For higher income, the price tag per bottle did not affect power to purchase and was deemed affordable for next 10 years. Although, from the study the waged workers were acknowledge that their income would be increase by national law on income rate per day, so there wasn't much worried about the pricing. However, if economic pricing of food and essential products in daily usage change in prices. They have to start saving for price shift of health supplement also.

*When my health deteriorates from years back, I started saving for health expenses. There are many choices of health supplement, synthetic or natural extracts. Some were expensive and some were affordable from time to time. I've never seen any price fluctuates more than reasonable pricing. For bacopa, it was effective for me and money saving from pocket for bacopa would be available in the future but if it turns out to be expensive for some reason, retail store with low prices would be first choice. The gradual change from 175 baht to 192 baht was reasonable with economy and inflation. It is affordable.*

There were also lower income subjects that were still working, these were people who were in countryside self-employed and retired people whom still working, of these population account for 17.3% or 220 people mentioned that it was affordable for them, the numbers were under 25 baht change which was reasonable for 10 years inflation pricing.

With retired people and working people that were non countryside; working and retired with low to moderate income, it was seen that 10% increment in pricing was cheap and reasonable for purchase. And if there were changes in pricing that could affect their spending of living and lifestyle, considerable amount of purchase on promotional bargain would be a good choice for the next 1 to 2 years, when the price would have a big change. However, they don't believe that the price would go high and if retail services include manufacturing changes, if the price goes up to 30% higher, it would still be affordable within the next 10 years. It has already been

affordable formerly for them when the bottle price of competitors were 450 baht in retail stores. However, with the earnings they have it been more reasonable to purchase one bottle every two months.

From this it can be foreseen that countryside people whom doesn't earn much, was able to purchase one bottle at a time if prices were increase up to 30%, based on their expenditures of former expense on bacopa that had market entry price of 450 baht per bottle for competitor's brand.

For high income subjects, both retired and working sees incremental price change of 10% as minimal changes and was affordable for multiple bottle purchase 6 or more, if the product would be scarce or from service added pricing for retail stores. Although from their experiences, they would be using services if it was reasonable, meaning that more quality service received or travel expense saves fuel and buying cheaper product at further places would be unreasonable.

*Pricing of bacopa with increase of 10% changes were reasonable with inflation, but for 30% changes there must be some quality service and pill qualities involved that can be reasoning that it is worthed. If it is worthed 455 baht, I would still buy it because there may be changes made to retail service or pill quality that would help body functioning better.*

However, for very low-income people and high expenditures monthly, in the countryside if prices were unaffordable in some months that their money was unaffordable, they would save and wait for purchase at later time. While waiting, some multivitamins and tonics can be taken prior buying bacopa for use.

*If price fluctuates higher than monthly expense can afford, they were willing to wait until there's money to purchase because it can help mental and physical functions better just in case when it is needed, for short term use.*

It can be seen that bacopa use still effective in short term and long term but if it is too expensive, it might be using as short term instead. Although, bacopa itself in nature is natural supplement, when use continuously and pause may see continuable benefits during its use and regard as safe. So, it would be effective in continuation for



mild memory problems in pre-geriatric and geriatrics that doesn't have much memory and cognition problems. This would result in short term adherence but benefits would still be able to see in these groups, in reality with economic insufficiencies.

Anyway, situations this might not be true in the future because there were many sources on bacopa plantation and imports is always available from India source. So, the inflation and economical continuous use for longer than 6 months observed for regional study found that subjects in metropolitan and metropolitan suburban was not a problem. A long with provincial, its suburban, and countryside has no problem with incremental changes in bacopa extract pricing when inflation cause the price shift. Countryside was not a problem for incremental changes for future of 10 years. Although, people hope for Chakri help on the Chonburi farming of bacopa if it can help alleviate prices of bacopa extract in the future for the production and resilienceness of product available on market. There were a lot of old people living in the countryside and provincial area of suburban and city area also has a lot of old people whom may be in need for future use of bacopa. Making bacopa extract cheaper for consumer at large scale may increase people's wellbeing.

Also, the bacopa was regard as essential for long term use in stressed people and geriatric people because the cost effective for 6 months use was satisfactory. At the interview, it was observed that memory and learning were enhanced, forgetfulness and anxiousness were decreased. Improved chronic memory problems gets better with less mental stress and anxiety, thus prevention of deteriorating health along the aging process. Also, when they work throughout the day, it seems they were making progress in work planning and less problem with memory learning. Some were taking for prevention of mental disease such as dementia and Alzheimer prevention according to medical news, and still sees no problem arise from bacopa use.

**Please explain about product quality and your satisfaction of product pricing in regards to quality offered.**

At first glance was satisfactory for attention and purchase, male and female satisfactory were indifferent from each other. Overall product quality from bottle to tablets were satisfactory in male and female reviews equally. The product came in a

bottle with cover that prevents moisture and sunlight. The sticker on the bottle was well form and attached. This quality was very good as some of the subjects in countryside that couldn't read, they always bring the bottle to retail store and let the clerk get the item for them. The tablet was very well pressed and clean, slightly distaste to the pill similar to andrographolides that has bitter taste to its identity.

There wasn't any crack in pills or manufacturing defects, which sees as one of the qualities that manufacturer was very well commit to their quality and manufacturing service.

Working class of low income were satisfactory with the expense on the quality they received, about 91% were very happy and 9% felt so-so because they were used to taking the pills before, but all were happy with the effectiveness of the pill regardless of the tablet form of the pill. All seem to understand that if capsules were used, a higher price tag would be put on consumers rather than enjoying the effectiveness of the pill in tablet form that is cheaper and continuable for many people.

Pricing of 5.83 baht was cheap for the quality received in standardized form. It was agreed among the working class of low income and retired class of low income monthly, the quality was superb for the tablet although, some were acquainted with gelatin capsule form perception that it was more in quality. However, later explanation on why is was tableted in a form brought understanding to them that extracted and active ingredient standardized amount in each tablet was already highest quality achieved. These people were people whom perceived capsule as very high quality, although didn't know that not all capsules were standardized extract and gelatin capsule form may be more expensive for them.

It for moderate to high income in retired and working class, they seem to be aware of what they take all the time, there's a sense of awareness in what they are doing, feeling, and working towards. They perceived tablet form as a valued quality, the reasoning that they have seemed to understand that capsules can cause problems of shortages and they were happy that it was tableted rather than capsulated. When working with strenuous work all they care was the effectiveness of the pills', extracted form was what they perceived as high-quality pills with best cost-effectiveness. So, there is a degree of satisfaction of tablet quality in this group.

*The tablet taken was green color and there's a slightly distaste and mildly smell but it was good quality. Effectiveness was good when use in long term, the memory and learning was better. Although, the quality from the bottle to tablet inside was very good in protection but the effectiveness of the pill was what I was searching for. When taken in long term, everything starts to improve within one month and it feels better. I was satisfying with the pricing 5.83 baht per pill. This can't be found elsewhere in the extracted form in Thailand. GPO brand has the cheapest too, pharmacist refer this as a genuine type of extraction, so other brand extract may not be the same.*

This was an example of one of the interviews like many that emphasize their satisfaction towards pill quality as the extraction was standardize, so every pill works like other pills in same dosage. Also, there were no difference in opinions regarding quality of tablet from places of living and working in Metropolitan, Metropolitan suburbs, Provincial urbans, Provincial suburban, and Countryside. Only minor misunderstandings that gelatin capsule was high quality form, as continuous use of capsule products was prominent in these groups when interviewed.

*The received quality in tablet form was good, the size didn't have any problems in swallowing and easy to be taken daily at any time. I took it in the evening, as it helps calming anxiety and get a good sleep afterwards. Some people might take it in the morning when they have to get up earlier and ready for strategic work throughout the day. The quality in effectiveness was good, I knew it was standardized and in reality, you can't complaint any pills that you won't get good health from it. I get a very good night sleep from less anxiety and able to learn and keep up with new things readily.*

This was an interview from a pre-geriatric age lady after she was retired for some years. Although, she mentions her neighbors taking it while going to work and found its effectiveness in learning and thinking also.

Quality of extract was standardized was one of the qualities that people praised for cost-effectiveness of the pill and was very satisfied that it was continuously effective for them, one of the reasons they came back to buy for health

improvements and prevention. It was very good to know that standardize had some meaning to people who doesn't know anything about tablet technology. Some were surprised when they know every tablet contains same amount of material in active ingredient, after long interviewed with explanations and feedback. The kind of same information were given to subjects through retail clerks and pharmacist. For educate people felt informed by the retail clerk, although more positive impression was seen in people who were lower in education and these people tend to seek quality more because better technology means it is more helpful to them. More opinions can be seen from interviews such as:

1. *"Tablet product looks good, manufactured with quality"*.
2. Tablet looks good when taken, and all tablets inside doesn't crack so the quality was assured, before taking the tablet every day. Taking every day the tablet does work, its good."
3. *"The bottle looks good and easy to carry around, the wrapping around the bottle doesn't fade off easily when carrying around for two months."*  
This is crucial for some subjects whom doesn't know how to read but takes bottle to pharmacy to get a new bottle. It was satisfactory for most under educated people.
4. Pricing of 350 baht per bottle worth of two months has quality praise through effectiveness
  - 4.1 *"Every day taken feels good"*.
  - 4.2 *"Monthly progress sees changes in memory and cognition"*
  - 4.3 *"Monthly progress sees changes in mood and anxiety lessens"*
  - 4.4 *"Physical movement performs better and better memory seems to prevent Alzheimer"*
- 5 Satisfaction through tablet was better in people whom avoid animal containing medical products
  - 5.1 Interviewed people, some were Muslims that needs HALAL label to make them feel safe from religious practice, as it signifies cleanliness and non-harming. Among these were only 5 people.

5.2 Also, strict follower of Guanyin for example tends to avoid bovine containing supplements. Consisting of 4 people, which isn't much but was seen among geriatric adults whom were Chinese descendants.

5.3 Another group was strict vegetarian whom tends to avoid meat of any kind, also were satisfy with the tablet form of bacopa extract. There were only 2 people in the study.

5.4 On occasion of traditions of Chinese, during weeks of Chinese New Year people tend to eat food that doesn't contain meat. Although, imitation meat may be consumed which was very healthy diet for them. Chinese group of people during the interview also praise bacopa that it doesn't have capsule that doesn't origin if it contains animal meat gelatin.

Satisfaction for price in continual quality in long term use, working class of low income and high income shows long term positive result in continuation of product usage through quality received alone and compared to other product, bacopa extract was seen as superior in quality and effective outcome. Also, the effectiveness was seen prominently among retired people, regardless of low in come and high income, all showed increase mental function, more learning, memorizing, and better ability to recall.

Quality in capsule and effectiveness can be seen in metropolitan and suburban metropolitan, where wage workers often use them to enhance their memory and learning, the effectiveness quality was the same throughout, this portrays the efficiency and good manufacturing practice in every pill. It was also seen in effectiveness in self-employed people in metropolitan and elsewhere such as provincial and its suburban and countryside. Bacopa was used effectively and satisfactory in quality pill price that it was continually use. Self-employed use them as memory and learning pills, so their day remains calm and thoughtful, required for thinking and answering customers.

In the group self-employed and retired group have in common were memory and learning which is essential for long term use where appropriate. The cost effective for 6 months use was satisfactory for geriatrics and satisfactory price per pill was

given very low cost-effective than other pills they've used, whether using bacopa alone or combined with multivitamins was superior in cost-effectiveness than other enhancement pills that were herbal extract that cost more expensive. The satisfaction in quality for improvements were seen in memory and learning, improve forgetfulness, less anxiousness and anxiety reduction. Prevention of deteriorating was satisfactory with non-deteriorating health condition, while days were normal with self-awareness of non-progression of age-related memory and learning deficits.

**Please explain how well healthcare provider provides you information that is essential to you when using the product.**

Metropolitan were very well informed at the retail center of GPO for bacopa, there were also brochures available. The clerk and pharmacist were nice, they were available sometimes when you need them to be helping with you in the very early morning, when things get busy during the day. They may not be available, but other channels of communication were available such as telephone and communication chat when request.

From the interviewed it was found that retail GPO was handle their customer very well on the information given to consumer. They were able to provide brochure, consulting, and important advises on continuation and things to remember if allergy happens or effects that were known to happen while taking bacopa. Although, subjects taking bacopa in this study has no side-effects involved and were able to continue to the end of the study.

It can summarize that in working class that were educated people, regardless of age and gender, received very informed education on benefits, daily use, what to expect and what can use with bacopa for increase stamina and mental health. The clerk and pharmacist handle gender group very professionally regarding their gender difference and what medicines they were taking with bacopa, if any. The service was satisfactory to people in this group, they were very well informed, know what they can expect, and what to do after long-term usage has come to fulfillment point for pause before continuation of next regimen.



In non-educate, less educated, and lower than university degree, all were treated professionally and equally in gender when providing knowledge for bacopa use and self-care. All were satisfied with the even encountered with clerks and pharmacists and they received a tailored communication at the level of language they can understand and time was being used while informing with care. People in this category felt that the clerk gave very well information with caring mind and assertiveness. The feeling that they get was warmful and friendly. This helps them remind taking the supplement correctly. It was described as:

*The quality service received was very informative and warmful feeling. You can still feel it after you look back and the cared service with warmth every time, when you think of it makes you remember it correctly on how to take the pill and stay informed with the clerk.*

From the interviewed, it was perceived that retail clerk were taking customer care to continuous informed level where it wasn't described in a few minutes on how to use but rather how to use it and stay informed, which declares an action of pharmaceutical care where clerks and pharmacist steps outside and take care of customer with best current knowledge to stay informed.

For educated geriatric and non-educated, these two groups have same accountable service in quality and care, that is the clerk and pharmacist describe thoroughly and went on specific qualities that was beneficial and reason for continuation and pause when needed. How to monitor themselves with the language that were easy to understand and check understanding with the calmness. It may be presumed that all aged people in the retirement age, many in metropolitan were educated and less educated but when making guesses won't be right all the time, an easy language use would convey more meaningful and easier to understand that makes a good communication practice for people that may have hearing disabilities in old age. This was seen in metropolitan and metropolitan suburbs whom received service at retail GPO setting.

For working class elsewhere in provincial and provincial suburbs, educated people were given more information bacopa benefits, long term use benefits, and long term expectation with safety precautions involved in using bacopa. The subjects were

really satisfied and appreciate the service when ask on their feelings and timing used in describing. Accumulate timing was around 10 -15 minutes depending on subject's needs to be thoroughly on conditions and medications that would be taking with bacopa extracts. The retailer with pharmacist has these abilities. With retail staff available and subjects that weren't on any medications, were referred to retail clerk for help when taking long customer service care. Some subjects added *"customer needs to be at retail store in the time after early morning when pharmacy isn't busy and you get to talk to pharmacist directly, for him or her to go through your medications and supplements that will benefit you in synergistic way.* This can be seen as crucial timing that some customer can approximate to rely on good servicing time and pharmacist will not forget easily when checking because they don't need to be hurry for next customer in store.

*Good timing visits makes a communication easier to understand and memorized. If the pharmacist is talking too fast then it is hard to remember things quickly and at an old age, the impairment in vision and hearing sometimes is problematic in communication.*

Retired class were regard as pre-geriatrics in many retail setting, they were given care similar to adults but were aware of some deteriorations in health, the service that was given to them was full of awareness as describe by some subjects that *"pharmacist often checks on your body functions, asking about yearly health check results, and medicines that you were taking, and also what underlying conditions you might have."* were mentioned by all Pregeriatric subjects that went to retail pharmacy store." It can be summarized that their service may have communication actions structured and work up of consumer care in a step-by-step wise decision action. When sensible action may happen from knowing their language level, indicating educated person a more appropriate level of language that can convey benefits and long-term usage safety may be explain to the educated subject.

In educated geriatric, the education of benefits, knowledge, how to use, and counseling for using in conjunction with other medicines were explained thoroughly in detail with each geriatric. As a result from interview, the satisfactory was reach and receives loyalty from their assertiveness in service. Also, the safety factor explained deem more customer loyalty from subjects because they weren't selling products but

help customer know what to expect and how to take care of themselves using herbal products that have benefits more than less risks involved, from certain studies on bacopa extract.

For non-educated and less educated people, same benefits and knowledge were explain to customers in understandable language, which received a satisfactory for the understanding of how to use, length of use, pause, and continuation, and how to monitor themselves. These customers were taken care thoroughly with going through list of self-medicate items or chronic disease regimen prescribe by doctors. It was satisfactory going to the retail store own by government.

Provincial urbans and countryside were places where there is less pharmacist in practice in some area but bacopa was widely distributed among health stores and retail pharmacies. The quality of service varied throughout as available number of pharmacists wasn't available in some area. Although, bacopa wasn't hard subject to remember but quality care from pharmacist varied throughout their education and self-study knowledge. There were certain studies on pharmacist that they don't have much knowledge on certain subjects was also published in journals. On bacopa knowledge and counseling, many pharmacists in retail study were aware of bacopa usage, its use, and how to educate subjects in this study.

It was seen that working class were given detail uses on bacopa extracts and how it can help workers in fatigue, anxiety, memory, learning and mental readiness. They were benefit on positive facts that can help them with their working situation and perceive benefits on memory and learning as an 1extra benefit.

*I usually have problems sometimes when work strenuously, signs of fatigues were prominent with sleeplessness and anxiety on certain jobs needs to be done quickly from start today and needs to finish within tomorrow. It is a lot of job functions, learning and memory becomes important game in everchanging technology and business. My pharmacist was aware that bacopa can help along with prior vitamins use that can help brighten morning wake up. List of vitamins and medication work up were provided with safety precautions and recommendations. Now, I can use bacopa continuously and enjoy its ever-fruitful benefits that I can receive from low priced bottle.*

This was one of the expressions from a wage worker that enjoy using bacopa for mental stamina, memory and learning, and physical readiness for important work days in a rush time.

In retired class, provincial and countryside subjects were informed more benefits on memory and learning and extra benefits on physique movements that can be help from bacopa extracts, as seen to work in some studies that were related to epileptic conditions. In retired class, retail in provincial and their pharmacist were similar to retail in metropolitan, there explanation of bacopa extracts were readily available before the GPO extract arrival. So, pharmacist know what to expect from customer whom came for help. So, it wasn't hard for the pharmacist to guide customers through benefits, how to use and how to monitor themselves while using it with chronic disease medicines. So, in the chronic use of bacopa for more than 3 to 6 months was safe for adults. Subjects did not have any problems on their continuous consumption and were satisfactory with retail pharmacist in provincial and countryside area. Although, in this study provincial areas were in southern, northeastern part of Thailand, suburban of Bangkok metropolitan, and Bangkok metropolitan, more study would cover retail service behavior towards customer that can help explain service quality country wide. The service quality was indifference in gender, education level, and income-level. There was no discrimination in servicing quality but pharmacist and clerks were assertive about their knowledge and portray training education that can help customer choose what they need and bacopa knowledge, benefits explained, and counseling was considerably high in detail. Although, there weren't any patterns on working up consumer knowledge and what they can learn to benefit themselves, pharmacist was able to provide sufficient knowledge to customers or subjects in retail store. It may be that returning customer were people whom they know from time to time and experienced with the same customer enable pharmacist to be closer to customer and know what can benefit them from their aging progression.

**Do you feel that healthcare provider is reachable when you want them to counsel you? Please state service quality that you were offered.**

In metropolitan wage workers whom visited 24 retailers had opinion that retail the clerk and pharmacist were reachable, commonly they described as

*when I reach the retail, it seems like they were busy refilling stocks for purchase but when I enter the store, the clerk was always active in walking towards the customer and ask for customers' needs.*

This may come from the fact that economy is recovering and to compensate economic loss during pandemic, clerks and workers within store must be active and increase sales at the same time. Also, a subject whom worked as managerial mentioned:

*I went on a busy day and had to wait for some time, although the clerk notices my presence and reach me in a few minutes. It was my first time at the retail and have my diabetics told to the clerk, she advised to consult with the pharmacist before taking bacopa. The service was very well informed and counsel with care. It was safe to take together and was told that if any disease regarding low blood pressure or high blood pressure begins with aging, I should come back to the store again.*

It seems that all retail store that were government and non-government exhibit the same service. With retail service in metropolitan, there were also few handouts for customer whom purchase the items and phone numbers were given for customer to call for need, assistance, and consult with pharmacist.

Every retail pharmacy in the study has no problems in customer reach, all were the same for during work hours. However, with the policy of some retailer and working behavior of pharmacist, not all were reachable after works, depending on self-own retail, hired pharmacist, and store policy itself. Sometimes, store policy has restricted contact pharmacist after work and tends to take care of customer during working hours, which customer can schedule their time to consult with pharmacists, or just walk in for consult if they have time to wait.

Retired people living in the metropolitan have given their opinions that

*“The service was very well with good manners to old people. The pharmacist was well experienced. Talk with politeness with intonations like you are being cared for, which was really appreciated. After the store was open for walk-in after pandemic, the pharmacist was reachable at all time. I can remember, during harsh*



*pandemic, the store was tightly strict for entrance. Not many people commuting near store and it was easy to purchase. However, with the way of people in metropolitan, it was the same like before, if you want to talk in private and have time, avoid rush hours that young people need to get their items during morning, afternoon, and evening after work. The hours in between were good for visiting, or in the weekends where many people don't travel much."*

Regardless of educated or non-educated retired geriatric, the store owner and pharmacist were always polite to the coming guests or subjects that makes purchase at the store. This was seen like family business that welcomes warmly. This study has not participated with chain stores, future work can be done to achieve a study with their customers. The reason was because it requires a lot of approves to initiate studies.

Most stores in metropolitan suburbs were usually family pharmacy, subjects describe their pharmacies were in small community or in street market stores. It can be seen that customer living in this area, either goes to retail store around their apartment, condominium provide by employer, and their own home. All subjects were complimenting their service was good in providing knowledge, education, and consulting on herbal supplement and drug use. All consumers were treating the same regardless of social status and received equal quality of service. Although, some of the people whom uses bacopa together were asked if they know each other, which wasn't a surprise when some of them knows each other in metropolitan area and elsewhere in the provincial and countryside. This might may come from the fact that bacopa extract were spread from people telling each other, which there were considerable amount in the study.

Some of the people whom living in the suburbs when they go to metropolis, sometimes they buy bacopa from the GPO retail store and retail store participate in the study. Returning answer confirm that GPO retail store had the same quality as described by other consumers who have received their quality service. Consumers were very well informed and pleased with the information service and consults regarding herbal use. The quality serviced was described as:

*Very informative and straight forward with uses, benefits, and timing for repurchase and continuation. The pharmacist was very well educated and gives*



*information base on what customer needs to know and how to take care of themselves from time to time. It was a very good and well communicate experience. Although, it may be different a little by the opening hours that retail pharmacy in the suburbs were still open late at night. So, in reaching customer, the retail store in the suburbs tend to be more reachable in person if need service in person. GPO retail store was also reachable in their opening hours but it would be quite late to return home in the suburbs. However, seeing both retail pharmacies service, the quality was not different from each other.*

This was from a worker from suburbs whom usually purchase their bacopa from the store near apartment, or goes to metropolis and purchase from GPO retail store. For retired people living in the suburbs, usually they purchase their bacopa at the family pharmacy near the market. It was a family pharmacy that they had been customer for a long time and some of these family pharmacies were chain stores with same name or different name, owned by Chinese families. This was different from retail pharmacies where younger wage workers go to buy bacopa, as it was described that retail pharmacies were near their living and some were near workplace, on the way to bus back to apartment. The retail pharmacy own by Chinese people were very kind and informative to consumer, as described by retired worker:

*The retail pharmacy I went to, was owned by Chinese families whom was acquaintance of market owner where I used to shop for fruits, meat, and vegetables every now and then after I came back from work. The pharmacy now had pharmacist at opening hours, they were very good at informing drug use and herbal use. I don't have any chronic disease that were diabetic and hypertension. They were able to guide me on how to use the bacopa tablet and know what to do if have certain side effects that may come from bacopa. I was very happy. The pill is very effective in long term usage, now my memory is better.*

Retail store in the provincial area, were mostly family pharmacies near the streets, there were some pharmacies that were situated in the air-conditioned market and department stores but they weren't family pharmacies, rather small chain drug stores ranging from kiosk size to large retailer. The large retailer mostly was department store owned or large retail chain that were own by conglomerates. Similar

to people in the suburbs of Bangkok or metropolis. People whom lived near the province also goes to retail stores in provincial area also. Since it is not hard to commute to province area within 10 kilometers, motorcycles were effective mode of transportation for many people and car for some.

Provincial suburban area working class purchase their bacopa extract from stores in town. They travel about less than 10 kilometers from the provincial center area. Most pharmacies have their pharmacist ready at the store for servicing people and customers. In the provincial suburban and countryside there were people whom already know a lot about certain herbs and their benefits. When people come and ask about herbs, they usually don't ask what it is use for, instead they ask about long term safety and using it with other herbal or drugs. In this provincial group, many feel they can reach pharmacist after 16.00 p.m., it was the time when most pharmacist came out of work in hospitals. The time to reach was quite late in some pharmacy, similar to provincial urbans and countryside. The store usually opens late at night, around 10:00 p.m., however due to the nature of stores that the owner operates the store themselves, it might close a little bit earlier when there's no people on streets sometimes. So, in reaching person sometimes a call can be made to affirm that they would be open until the time getting there. Although, it doesn't happen often but it's just somehow some store operates in the suburban and countryside. As one can see that the streets in countryside along the way to provincial area during night time, were usually empty. People sleep early in the evening and waking up early in the morning was the way of country life.

*In reach retail pharmacist, if any retail store are open, it is reachable depending on which pharmacy one goes to, most pharmacists can give you plenty of information of what you want to know about herbal supplement, bacopa, or any drugs. In opening hours, you can visit any pharmacy with government approved logo that it is quality drug store, this one has pharmacist at all operating time and their clerks were very experience. They can provide you any information you want regarding your health needs.*

This was one of the answers from interview that retail pharmacy with quality approved has pharmacist available at all time, also in similar the operating hours for some pharmacy might be differed and reaching pharmacist through timing of opening

hours would suggest that reaching in earlier time will reach pharmacist better before some pharmacy closes down before their closing time, in the provincial suburbs and countryside.

As Thailand is not a big country and most people were government officials, farmers, and some businessmen and women. It can be summarized that all family pharmacy takes care of their customer as people who are friendly and dependable along with pharmaceutical care, where retail in the metropolis were more assertive and straight forward with important things to be discussed and consult about.

For wage work in the countryside, it was very easy to reach the pharmacist at retail. Many stores at the present time have pharmacist working at opening hours. Although, most stores have pharmacist at the government hospital open their own stores like family pharmacy. It can be described by a wage worker below on retail pharmacies in the countryside.

*People who were still working was very informative about the product they were selling, although it was continuously purchase, the pharmacist seemed to be reachable when in need. When asked about chronic disease to be precautious about the pharmacist answered with good knowledge of herbal, conditions, and combination drug use. They were reachable since, it was one of the active pharmacy retails in small town. I still have their phone number when they are working and still reachable through LINE communication application. Although, another route was possible for contact was Facebook. Although, it was easier by using line and consult few simple things when needed. They don't mind reaching them and see it as customer care continuously which was a good thing.*

Wage workers were people who were not highly educated for some but all people know how to use smart phones to communicate with people they know through smart applications and voice call. It wasn't hard for them to use android or iOS. There was no difference in ability to use phone functions less than other people whom has higher education. People with education and non-educate

In the countryside, most people were friendly people and everyone knows mostly each other when they live in the area or has been customer for a long time. The service was friendly as described by subjects whom lived in the countryside. It was the pharmacy that they go to for every month, to get supplement and vitamins for the

days that they are not sick but to keep taking for their health and vitality. People were usually well cared for regardless of gender and age, most people were not much educated so it can be described as well nurtured and cared for.

*The pharmacy I went to was in the small town where I grew up, it was still operating and the people there were also old. There was no change in its size, since it was a small building but some of the supplements and drugs were changed from approvals they have from the government. The quality service I received was the same thorough out. The clerk and pharmacist were not hard in reaching at all, they don't pretend to be busy or avoid servicing people. Most of pharmacies went to, people were friendly and kind. Some of the clerks were eager to sell supplements when they see you tired, so they were not hard to reach at all. Special subjects categorize into point of service and felt clerk can be reach*

This was one of the answers from interviewed for people in the countryside. Most of these were people who were stressful and needs bacopa for memory and learning. There were also special population where people in need of chronic disease herbal care, prevention of deteriorating health, and prevention of memory and cognition deterioration in geriatrics. When these people were asking of quality service and easiness of reaching pharmacist that can take care of herbal use and drugs involved. People in the metropolis and provincials have the similar answers that the quality service was the same in communication and consulting, they were very helpful in reaching out for what herbal supplement and vitamins you need. Reaching them at pharmacy is not hard when you visit them at correct time where they don't have to rush and serve you during busy hours.

In countryside and provincial suburban, where the retail pharmacy was able to serve people wasn't hard to reach at all, the pharmacy has pharmacist operating at opening hours and most of the time, there weren't many people in the small town. So, it is easily reachable at any time, even around noon there wasn't many people, so any time is almost right time unless it is around 6.00 p.m. for most that people return from work and may buy some medicine for common illnesses. These were indigestions, small wounds antiseptics, cosmetic washes, and simple infections medicine.

Demographic	n	%	Reachable		
			n	During Work	Out of work
<i>Metropolitan</i>	286	22.56	24 Retails	24	21
<i>Metropolitan Suburbs</i>	373	29.42	28 Retails	28	21
<i>Provincial Urbans</i>	108	8.52	12 Retails	12	7
<i>Provincial Suburban</i>	213	16.80	15 Retails	15	12
<i>Countryside</i>	288	22.71	23 Retails	23	18
<b>Total</b>	1268				

It can summarize that the number of subject agreeable in reachable events when compare between metropolitan and provincial retails, although in suburban there weren't many reaches for information regarding usage and long-term use. Later when patients were asking on their usage, suburban in provincial and countryside agrees. The usage was in continuous, the safety measures were explained by pharmacist so there less to be worry because it was vegetable extract. A lady whom her grandchildren had purchased for her had been taking the capsule containing non-extract bacopa, was seen in good health.

*It has been taken for a long time already for people whom knows about folk remedial. Some people whom lived nearby also take the capsules for good health. With the extract tablet, everything seems fine as usual and she was able to walk and remember things a lot better. Before this, there were several aches from muscle and knee when she walks, a pharmacist recommends her taking capsules for walking condition with pain medicine. After recovery, she had been taking the capsules since and her health seems to be better along with better memory and learning. Although, it was better in adherence when she had to take only one tablet per day.*

Retail pharmacy was reachable at opening hours; however, pharmacist was reachable at their working hours. It is hard to reach through phones during busy hours only. Sometime, they have to wait many minutes just to get through and wait several minutes to talk to pharmacist when they have important question to ask. Although,

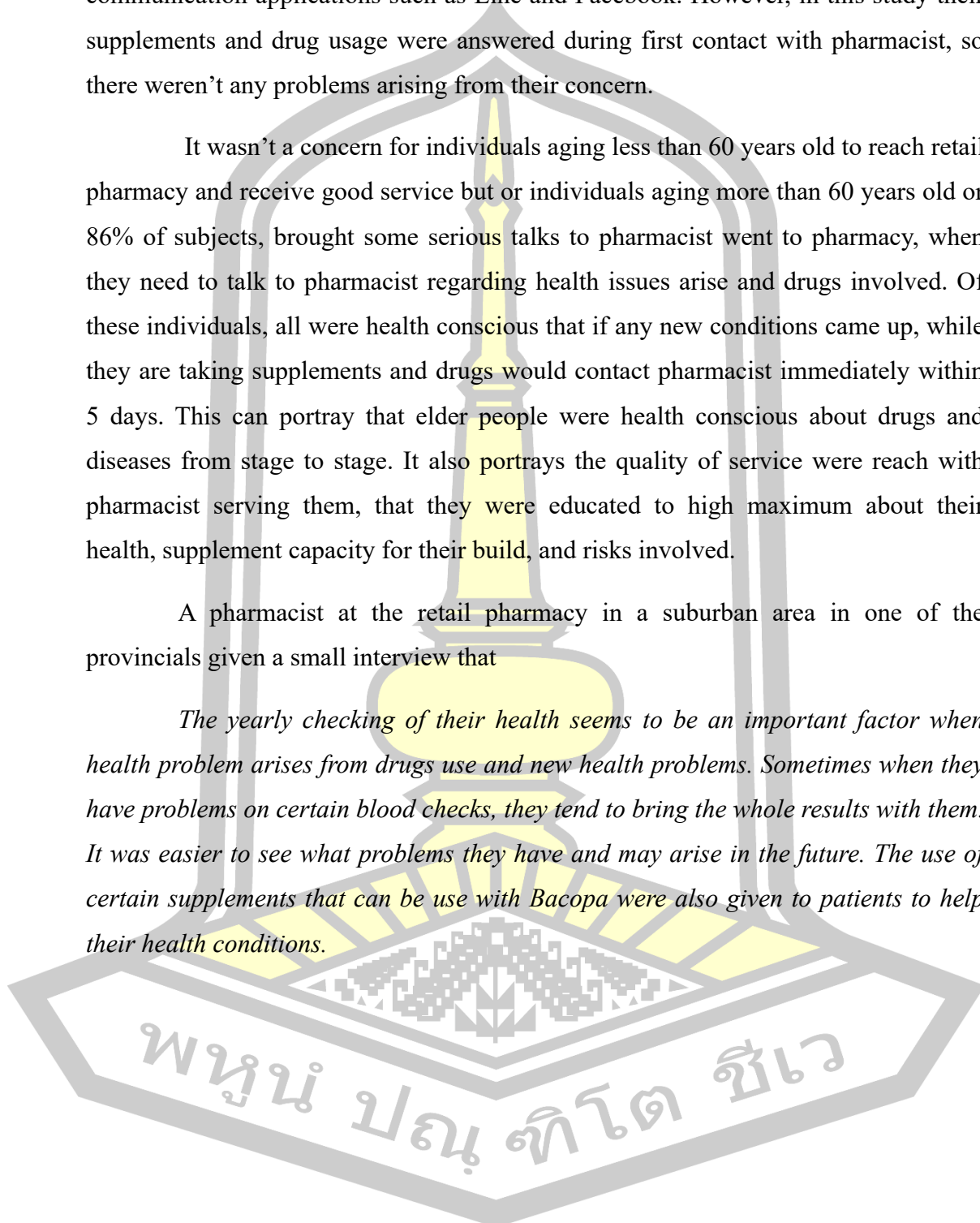


most patients feel that their pharmacist and retail stores were reachable using modern communication applications such as Line and Facebook. However, in this study their supplements and drug usage were answered during first contact with pharmacist, so there weren't any problems arising from their concern.

It wasn't a concern for individuals aging less than 60 years old to reach retail pharmacy and receive good service but or individuals aging more than 60 years old or 86% of subjects, brought some serious talks to pharmacist went to pharmacy, when they need to talk to pharmacist regarding health issues arise and drugs involved. Of these individuals, all were health conscious that if any new conditions came up, while they are taking supplements and drugs would contact pharmacist immediately within 5 days. This can portray that elder people were health conscious about drugs and diseases from stage to stage. It also portrays the quality of service were reach with pharmacist serving them, that they were educated to high maximum about their health, supplement capacity for their build, and risks involved.

A pharmacist at the retail pharmacy in a suburban area in one of the provincials given a small interview that

*The yearly checking of their health seems to be an important factor when health problem arises from drugs use and new health problems. Sometimes when they have problems on certain blood checks, they tend to bring the whole results with them. It was easier to see what problems they have and may arise in the future. The use of certain supplements that can be use with Bacopa were also given to patients to help their health conditions.*





**Please explain if you have any problems concerning the usage of product.**

Age in years for people whom has concern for using can be seen when examined through interviews

<b>Demographic</b>	<b>n</b>	<b>%</b>
<i>&gt;80 years of age</i>	26	2.05
<i>&gt;70 years of age</i>	127	10.02
<i>&gt;60 years of age</i>	74	5.84
<i>&gt;50 years of age</i>	557	43.93
<i>&gt;40 years of age</i>	484	38.17
<b>Total</b>	1268	

<b>Demographic</b>	<b>n</b>	<b>%</b>
<i>Severe &amp; Chronic Illnesses</i>	72	5.68
<i>Chronic Conditions</i>	409	32.26
<i>Stress &amp; Chronic Fatigue</i>	586	46.21
<i>Geriatric Health Prevention</i>	118	9.31
<i>Pre-geriatric Health Prevention</i>	83	6.55
<b>Total</b>	1268	

The problems of bacopa usage tends to come from physical strength of bottle and product characteristics rather than the administration time and difficulties involved. Bacopa was safe product to use with little or no side effects involved for adults, some show side effects in long term use for teenagers under 15 years. Although, it showed some benefits for attention deficit disorders after use. In most medical research, bacopa use were safe for more than 1 year usage. So, in problems that may come from efficacy was not a problem in this study of long use within 6 months.

Common problems that were seen population were fear of product won't work. This was one of the factor that show up when they first taken the product, about 80 people from the upper age group more than 60 years old have some type of fear

that it won't work or their memory won't improve before taking the product and while taking product for less than a month. But it was a good try for a product because there was nothing else. It appears to be safe and improve in memory learning for the 80 people involved in fear. This was accounted for 35% of total retired population subjects.

*It was very fearful that supplement would not work and it might not come true like medical news you hear among the days when you were working. However, the pharmacist assured that it was used long before in ayurvedic medicine and was useful in many people. So, this helps calm down the fear.*

What was mentioned by several retired people, there was also fear in working people where the long-term usage may raise some side effects after a year of continuous use. Although, some side effects may show up only in teenage subjects but benefits also come from the usage. It was a mixed and risk benefits for teenage studies. However, in adult there may be a length of time that the product may be paused if side effects show up. Although, it might not happen in every body but it was seen as a possible risk. When patients were explained thoroughly, many of them knew how to use the product correctly from pharmacist and interviewer. It was in these group of stress and chronic fatigue people some geriatrics that has this kind of fear, consisting of 528 people whom had bacopa efficiencies helping their lives better. This makes up 41.33% of people. The rest were minimal in fear about their future use of bacopa, since their conditions were mild. It can be seen from the table that most people were in wage worker, self-employed, and managerial jobs.

*It was very fearful for me when using such product and it was helpful, while taken the product alone or with other products that help me stay less stress and more ability to learn and remember new things as the work requires a lot of learning about the technology, laws, and you meet a lot of competitive people along and had to stay on top of every new thing coming.*

Consumer fear factor of pausing was a type of fear that questioned how long should one pause or begin to pause, later when they were explained that when side effects may show or just about right time to pause a while less than a month would be sufficient for safety measures. This is because longer clinical trials were not available

at the current for longer period of safe use and minimal pause in use would be safer to continue another long-term use.

*It has been sort of chemical interaction with body tissues that some chemical drugs need to be pause at times for safety, such as omeprazole taken for more than 9 months would suggest a physician recommendation for continuation or pause. This would return the cells and tissues to normal function, so the body would not be affected by long term use of omeprazole.*

So, pausing practice in this herbal use would rather help practitioner doing good things and also help the retail business to sell more in the future by eliminating risks that may happen from long term use prior pausing herbal supplements.

Other problems that arise from physical barrier for tablet, or the bottle was also sometime causing dosage administration delay in some individuals whom had their children or grandchildren help in preparing tablets each day. This happens once in a while in 14 subjects of weak subjects in the study.

The bottle was legible and readable through using a magnifier glass for identifying the product for some subjects were seen, due to their vision problems. And multiple times were seen that when their grandchildren help with the bottle opening, it takes time to open up but for older people, it had to be open by younger people. The bottle was very well container with tight seal that repels moisture. Since it was made in tablet form, the moisture can get inside and may change tablet surface appearance

Although the bottle type can be change into new types of bottles but it would cost more unless the final product made was for refill that can be continuously use all the time, until new bottle would be good for use. This type of bottle can cost more than the current type, anyway with raw materials in processing plastic involved would be uneconomical when disruption at retail pharmacy can happen. So, the current type of bottle would be more practical for use.

Other minor problems were the bottle sometimes too small and when it is moved from place to place by other people at home, it is very hard to find. It came from vision problems in old people. Many times, when taken in the morning, if it was moved it would be taken sometime around noon or at night. However, the tablet was safe to take any time, so it wasn't a big problem to subjects whom had this problem.

The last problem seen in bacopa extract usage was the slightly distaste in tablets that when dissolved in stomach may cause some bitterness and distastes in patients whom has acid refluxes. Although, the bitterness may not come from the dissolved tablet but from digested food itself.

*I get this reflux several times throughout the day and taking bacopa in the morning, sometimes it causes distaste in my mouth but not coming from bacopa alone, there were some liquids and digested food along the way. Drinking a glass of water would solve the problem.*

Later this problem was cleared with the interviewer suggest that she takes bacopa with a glass of water before meal to prevent unnecessary reflux and the problem subsides afterwards. Also, a small meal would prevent gastric reflux from happening with digested food coming up the gastroesophageal tract.

**Do you feel good that you were given good promotions on purchasing the product continually? Please state what kind of promotions should be offered to you.**

86 % of people feel good promotions work very well for them, while 14% doesn't seem worried. Also, with nuclear family when large people living together and order the on-line products, which we're given further discounts they don't seem to be worried about how much they were saving when purchasing online. The discount would be a saving to them for 100 baht or less after shipping cost. Although, it was risky for them to stay outside of their house, so 200 baht discount for 20 bottles was a good option for most people who lived in metropolitan and suburbs housing that were far away from retail distribution in the city.

This promotion was country wide when ordering from the retail store web front in Bangkok metropolis. The postal cost was different throughout the country, but it isn't expensive at all.

Available promotions for the retail store outside of metropolis were usual discount when buy in pack of 3 or more. Which were seen in all retail pharmacy setting, but it was up to owner of the stores at times. Sometimes, when economy or sale isn't good during some month; the discount was less than 50 baht in observable

stores. This was around 1,000 baht per 3 bottles. Which was very good deal for people whom were interviewed earlier of pricing.

With the discount of 50 baht didn't affect their power to purchase much because 350 baht per bottle was affordable in continuation price. So, discounting 50 baht would not affect the continuation. In discounting, it would make consumer happier because in certain areas of the country, money can buy more things than in metropolis. So, this was the factor that contributes to consumer satisfaction in price reduction from multiple bottle purchase.

In metropolitan, people of high income have suggested that while more use of bacopa is more in the future regarding more geriatrics numbers within the country is increasing, the bacopa bottle could be made in a 100's tablet count to prevent shortage in tablet use before buying new bottle or next multiple sets of bottles for another year's use. This creates convenience for consumer. The price was seen as low price already or introductory price that was considered a promotion for all people to use the product. It was 100 baht lower than competitor's brand with good extracted and standardize tableted form.

For waged worker and low-income consumer, they want the bottles to be cheaper at least 1 more bottle for the same price of discounted 1,000 baht, or 4 bottles for 1000 baht would be good promotion for their needs. This is because their income was low already, if they have expenses like buying insurance, minor hospitalize from daily activities, or have accidents in work place that requires hospitalization. Their savings or money would be insufficient for future use. Same type of opinions was also seen in mid-range income wage workers and low rank managers within the study. The pocket money for everyday expense and savings would not be sufficient for future use, it would take some time to find money to make up the for new expenses.

*The economy of current situation after COVID pandemic and even before that time has effects on spending, the bacopa was affordable in current time but in the future when things can be change, there might not be enough money for use that can sustain health.*

This was seen in single people with expenses and whom were going to be married but still have fear of their future, regarding their jobs and future self. Economy is recovering from pandemic that happened four years ago. Many people lose their jobs and business, even now some business hasn't recovered yet and some still have their workers fired from the company. The problem was anxiety for most people whom work in private companies, and this raises the concern about pricing of bacopa when it seems to help them throughout the pandemic disruption of private companies and the future of economic recovery was still unclear. The reasonable future bottle price for these people would be around 250 baht per bottle of 60'.

This may happen in the future with the help of Royal Chakri bacopa plantation in Chonburi that lower prices may be available through the royal patronage help. The test field happened two years ago with successful harvest. Mass production would require future study on quality of active ingredients in harvested bacopa from the fields. This can help government to lower its price on bacopa bottles for sale within the country, if the GPO chooses to purchase starting raw materials from Chonburi sources.

For people whom lived in the provincial suburbs and countryside area. Their lifestyle and living don't require much money. Since bacopa was new for them, they continue to use for their health and see it as cheap products to buy for two months. Although, when asking about promotions that they need for continuation, most given prices in between 850 – 950 baht. This was seen as a future saving from economic instability and future inflation that can cause their power to expend in daily living. Also, a reduction in price around 100 baht could help them pay for Tuk-Tuk transportation. This was seen in people living in provincial suburbs and countryside. It was seen as minor savings, minimal but essential for current living.

When heard about Royal Chakri plantation, they were very eager about how much price they could be spending in the future, as in the past Royal Chakri had help them in their agricultural field already when the king and his people visited people in northeastern part of the country.



When differentiating between two genders about promotion, female tends to be more frugal on spending than male counterparts. Although, with people in the region of northeastern part of Thailand were more tilt towards the good feelings of hearing about the bacopa plantation fields in Chonburi. This may be important to brand image also in the start of raw material selection for bacopa tablets.

**Were you able to adhere to pills usage because of the promotions provided? Please state your answer thoroughly.**

With the promotions provided of discount in retail store, the continuation of pill taking was very adhere to use for the months within the study and in the future. It was very cheap from the bottle price; with further discount it also saves a month's daily expense.

*With the fifty-baht discount, I can buy one bunch of green onions, 5 eggs, 100 g of pork, and enough rice for cooking. All this can be cook at home before going to work, it can save a lot of expense in a month. Working 20 days during a month, that is saving for 1 day and have 19 days later for calculating what to do and what to spend on. It can also be saved for future bottle purchase, when pass by the retail pharmacy and it might be good to purchase a bottle for emergency when, bad things can happen and you can't get a new bottle in time.*

Although the bottle price was already affordable for purchase and use for two months. This was seen as a good start adherence, with an interval saving of two months for next purchase. Even though, without the promotion, users can enjoy affordability for bacopa use in memory enhancement and long-term anxiety reduction benefits. However, with the promotion reduction the affordability was minimal but in an affordable range for those people who have more needs of bacopa than people with mild conditions. With promotions purchase of 3 were seen in moderate percentage in people income in the low and mid-range. It can be summarized that it is affordable when need the most for their daily intervention of anxiety, memory, and learning. It has been observed that stress workers in low and mid income have purchased multiple bottles of 3 for their long-term use, also bottle of 6 was seen in geriatric people for securing a whole year usage. When ask during an interview, the answer was

*Bacopa purchased in 3 were proven to be useful for me when I don't have time to visit the store often because work around the clock was very fast. One day pass by very fast when you are an adult working with stress. It doesn't end slowly, by the time you think you are fast with your project, you are a bit slow, sometimes problem solving takes more time than usual, with communication on certain important things with suppliers and employees, the whole day end already. Also, when you go home it takes about 30 minutes to 1 hour at least for some. That is 2 hours spent already on nothing but travel.*

This was an excerpt from the interview that usually in managerial task, they don't have time to go to pharmacy all the time, so purchase multiple bottles were able for them to save time. From this long-term adherence was seen in this individual and others whom have the same purchase behavior from lack of time need for work that they have responsibility on. This purchasing behavior was also seen in metropolitan and metropolis suburban people who work in the metropolis, that time was not available for them when they were put on to project, they need to complete for their employers.

*I was able to use the pills for a whole year for my mild memory deficits that affects my daily life, that forgetfulness was often seen in aging process. Bacopa has help me for a year or so and now I am starting my second course for another year. This year I had a better version, the extracted one from GPO. It was used for two months prior entering the study, it works very well better than the unextracted one. The prior one to this one was also good, the quality was not less than specified amount in raw powder. So, there is some quality in each capsule. But the one I use now is extracted and cheaper than the first brand I use.*

This was interviewed from one of the subjects that was retired and start having memory problems. It was mild and the subject had start healing himself through herbal uses. The treatment for a more severe form of dementia and memory loss, would have hospitalization cost include the OPD drug cost around 350,000 baht per 6 months duration, this was around 12 years ago for government-based hospital using foreign import drugs for neurological diseases. In private hospital setting would cost more than this amount. So, using bacopa to extend hospitalization time would

create an economic health for the whole country through lengthen the time for people who would be in need for neurological treatment.

From this we can see the need for ayurvedic medicine drug or local vegetable plant in Thailand for use and creates economic sufficiency for every one by lengthen the duration of hospitalization in geriatrics that were able to afford herbal medicine that proved effective for such indications. It can be seen that people with Memory and learning were enhanced, Forgetfulness decreased, Anxiousness were decreased, Chronic condition related to memory deficits were already benefitted by affordability of 6 bottles purchase for a whole year use. The promotion was efficiently with expense of 2000 baht per whole year, that can extend hospital stay and foreign drug use for future years. It was quite economical, even though the price per pill was 5.83 per pill and lessen to 5.5 baht per pill.

For people with lesser conditions such as mental stress and anxiety, mental disease prevention, memory and learning, the price of reduction varied through stores for multiple of 3 bottles and multiple of 6 bottles were affordable for long term use. Although most agree that it was affordable from 2 bottle price already. This consists around 88.64%, 53.79%, and 44.24% respectively for people whom purchase the bottles for the reason provided.

For people who were chronic and severe conditions making up of 32.26% and 5.68% respectively, were agreed that it was continuously affordable through the year of usage. The same was agreeable to chronic stress people around 46.21% and also in retired group that seeks prevention of mental conditions from bacopa, combined percentage of people were 15.86%.

In difference in opinions on promotion given in demographic area difference. Following summary can be found on metropolitan and its suburban, provincial and its suburban, and countryside.

In metropolitan and sub metropolitan working class, there were no difference in educate and less educated people in suggestion that it was affordable. Since, the income from lower wage group and mid-range wage group the amount of pocket money was almost the same after expense on housing, apartment rent, and utility bills.

For metropolitan and sub metropolitan retired class, low income sees that 3 bottles were affordable through their long-term use, although with 6% of these people tend to purchase 1 bottle at a time, even though there were minor discounts for 2 bottles or more and 50-baht discount for 3 bottles.

Provincial urbans and suburban working class in less income and high income tends to think that 3 bottle was sufficient for their continuous use with 50 baht being a bit helpful for their daily expenses and some keep money for next purchase. While the retired class tends to have no problems the pricing, although most of them were retired class with constant income that doesn't affect their living or medical expenses on a monthly basis.

In countryside, most people were self-employed and work on farm fields. Some that were retired government officials can still be seen from the interview. Most people in this region income were widely distributed among lowest income, mid-range, and high income. The high income were retired officials mostly and some were retail business owners that involved with agricultural sector. Within the countryside people, multiple of 3 bottles and 6 bottles, have same feelings because they were able to sufficiently lived with their earnings, since they were food producers. Although, purchasing more than 3 some felt necessity and some felt unnecessary were sparingly seen in the study. It might be from the fact that they were also frugal. However, when ask if it can provide with long term adherence, they answered that the price was very affordable from base price and little or no discount was necessary. So, it can be concluded that it was affordable for continuous adherence in long term for people in countryside, with the fact that their income was barely used. This was around 128 people, about 10.09% of total population. Out of these population, there were people whom purchased more than 2 bottles prior the study about 39 of them, about 30.46%. However, prior beginning of the study, these 39 individuals were asked to start with new bottle which can be calculate for the earnings of retail synchronization, without effect on the outcome of the profit abilities involved. The interval starting new bottle was less than 2 weeks apart for the new start, which did not affect the profit calculate much on the retail synchronization study. The same protocol was explained to the rest of 1268 people also at the beginning of the study, so that the outcome could explain the profits in the study.

Feelings affordable by age from the promotional price that was given to them through purchase of 3 bottles for 50 baht less and 6 bottles for 100 baht less. Subjects were people whom used the herbal supplement for more than 3-4 months, prior enter the study. The table below can portray number of people whom used to bought 2-6 bottles prior entering the study.

<i>Age Distribution</i>	<i>n</i>	<i>2 bottles</i>	<i>3 bottles</i>	<i>6 bottles</i>
<i>&gt;80 years of age</i>	26	5	12	3
<i>&gt;70 years of age</i>	127	55	34	15
<i>&gt;60 years of age</i>	74	13	9	5
<i>&gt;50 years of age</i>	557	127	68	32
<i>&gt;40 years of age</i>	484	113	52	28
<i>Total</i>	1268			

**Please state how well you were educated on benefits of product from healthcare provider.**

Metropolitan and suburban regions were not much different in level of education in wage worker among people who lived in the metropolitan and the vicinity. Although more educated people were explained more about the mechanism of how bacopa works through bacopasides which was the chemicals responsible for effectiveness of the herbal supplement. It seems that educated people were people who were interested in deep learning of things, so explanations involving the active ingredient and benefits involved, seemed to be very satisfactory to the consumer visiting the retail store. It receives wide attention among the people whom visited and was a key to enhancing customer relationship when it does attract attention of



consumer, responding how natural chemicals can help their needs. The working class seems to be more attentive to the benefits, natural extracts involved, how it interacts with other nutrition and vitamins. Also, how long can they take to benefit their body with the safety of time length. The risk and benefits involved prior taking, when they have chronic disease and also what should they avoid while taking bacopa extracts. All of these commotions of factors were taken into consideration by pharmacist and taking time into educating and consulting was very well informed. The customers were very satisfied with the product education they get.

*The government retail pharmacy was very well informed and educate me throughout the possibilities of how I can manage my memory deficits with bacopa extract. There were brochures and handouts that was available at the time of visit. They explain about how natural compounds can help the body through some research that was involved with the extract after there were some trials of use to it. Although, the pharmacist also told that it was used in ayurvedic medicine for many decades and known for its benefits in anxiety, depression, memory and learning. There were also some benefits in psycho-emotional that can help in attention deficit disorder and also help in epilepsy.*

Other subjects in her late menopause prior reaching 50's, also mentioned the level of care when they were going through the risk and benefits. She has been taking chronic medication for her status and numerous vitamins for the neurological stress and tiresome of the body.

*I have anxiety from time to time and the stresses were causing irregular patterns of sleep throughout the months. I begin to forget things. With the muscular aches was prominent among the continuous sleepless nights. Somedays resorting to morning coffee but it didn't help much with the mental stamina and the ability to understanding new things. When I met with the pharmacist, every detail of situations in my life and causes prior chronic anxiety and fatigue has been taken into consideration, all of vitamins were look as another factor that can be continue, the menopause medicine was taken into accounts, and bacopa extract was selected to be the supplement suitable for me. I was told about the benefits with care and how long to take before feeling the benefits. it works almost the same as the herbal capsacin*



*extract, I was prescribed for the pain on my wrist. Although, it took less time than capsaicin to continuous work.*

*Now my wrist starts to feel motion free without the pain inflicting the movement. Also, my anxiety also calms throughout the day, I began to sleep better and continuously able to recover from forgetfulness. I start to recall many things better and have better views of my future. This is the 4<sup>th</sup> month of taking bacopa now and I will continue strong with it in the future.*

It can be seen that in the working class of people, numerous strategic educational materials like handouts and crucial information that consumer can make connections to how it works and how it will help was taken into action of explanation of benefits. This help information and benefits reach customer's mind and helping them to choose what is right for them also was another step to service healthcare. Also, there was no gender difference level of care in service, since the state of severity and multiple factors involving safety of use was taken into account more than gender issues. It was also to be noted that retail clerks and pharmacists were service mind toward customer when they enter the store with needs to be solve. Also, in the current doctor of pharmacy was professional degree that have strengths in pharmaceutical care also shows effect on behavior of pharmacist towards customers' need.

Retired class seems to be nurtured along with the help of selecting the right nutritional supplement and vitamins with the bacopa. Although, in practice of pharmaceutical care, the pharmacist within retail stores of government franchise has their own set of guidelines to begin with, a pattern that can be distinguished from other retails. This pattern of pharmaceutical care might reflect the quality pharmacy store. The care for retired class seems to be more elaborate on the status of health, disease involved, bacopa side effects, and drug regimen involved prior taking bacopa. From certain side effects and risks in long term use of bacopa, a start regimen of bacopa was start with a set of time to observe safety and it has been thoroughly consulted and educate among the retired and geriatrics that visited the store. This brings more safety and customer loyalty towards to store, when they need to care for, after their deteriorating health. In this manner of service, product education was exceeding formal explanation of how bacopa works, general benefits, and long-term safety. The patients were very satisfied with the service they get prior buying bacopa

itself and knew that they can rely on the service given to them. This sets the standard for their needs in continuous care.

For provincial urbans and suburban, the working class were satisfied with the retail store service they received from in-town retail that were family pharmacies. The retail service was quite friendly with the clerk service and pharmacy service. Knowledge about bacopa benefits were at moderate level with similar service practice by many. Some store has pharmacist that has herbal knowledge in dispensing. This was also helpful similar to retail stores in metropolitan that weren't own by the government pharmaceutical organization. However, similar to research in the middle east that test pharmacist of their knowledge. If one were to test pharmacist knowledge ability in herbal use and different drug use in each chronic and current illnesses would not be possible because the research was bacopa selective only. Although, with going through subject in the study, there was not much chronic disease that were against the use of bacopa and current medicines were not against bacopa use. With research paper among bacopa from the past to present, level of age was one of the factors important to long term use and side effects that may occur. Some disease might advise for precautions of bacopa was were also one of the factors for selecting patients by the pharmacist. All of this was preliminary round off by experience pharmacist seen in this study. This can be concluded that retail pharmacy outside of metropolitan also were successful with patient management in herbal use with chronic diseases and bacopa benefits education.

Retired class was seen the same similar to working class but more time were spent for pre-geriatric and geriatric for their current disease management and integrating bacopa into their daily life and how to take care of themselves for side effects that may be seen from start and how to pause for next continuation of bacopa uses.

Countryside, for normal people it was seen that some of these people got their bacopa from retail family pharmacies and health nutrition stores among the streets. There were a lot of these health nutrition stores along the streets in southern part of Thailand and in countryside of northeastern part of Thailand. These were stores among small villages that doesn't have pharmacist because they don't sell drugs. Most items within the shelf of these stores were herbal supplements that can be

sell without permission because they were label as supplements. Although the license typing for selling healthcare nutrition may be lower order that is allowed by the Thai government. In these stores, there were owners and clerks whom were able to provide information but in-depth of information of using bacopa with certain diseases and drugs were unavailable. Although, when interviewed from the subjects most were able to get bacopa for their benefits in long term and education on bacopa use was moderate. When they get the bacopa it was for their continuation of supplement use and it was economical for them to purchase in a nearby store rather than going to town.

Education of use and benefits can be summarizing that memory and learning were improved with less forgetfulness were educated among the time of use in bacopa and other vital nutrition and vitamins were observed. This result in memory and learning were enhanced with forgetfulness was decreased. Chronic stress and anxiousness were decreased apart from chronic disease that involved memory and learning. Deteriorating health from aging improved with long term continuation. In wage worker mental stress and anxiety were better in long term usage, this also help work planning and memory learning

#### **Retail Pharmacy Education in Wage Worker Group**

<b>Demographic Wage Worker Countrywide</b>	<b>n</b>	<b>%</b>
<b>Mental disease prevention</b>	72	5.68
<b>Work planning and memory learning</b>	409	32.26
<b>Mental stress and anxiety</b>	586	46.21
<b>Chronic condition</b>	118	9.31
<b>Prevention of deteriorating health</b>	83	6.55
<b>Total</b>	1268	

**Please state how do you feel about using the product long term after you have been educated on its benefits.**

From the patient interview, education on bacopa uses alone or with other supplements and chronic medicines have given help on decisions of patients to use long term. Although there was no difference in quality of information in satisfaction of people interview. All were satisfied with the service and felt even more better when the bacopa extract worked as described by pharmacist at the retail store. Although, some of these people may took a longer time than others, which may be from a lot of factors involved those were severity of stress, physique size, and conditions.

Variations among working class of metropolitan and its suburban were the same in continued long-term use until there was a time for pause after a year that was appropriate for another continuation, for safety reasons until there were new ayurvedic studies that can establish longer safety for bacopa extract. All subjects in the study were sufficiently educated on the usage and received long term commitment to bacopa users. This means that they were constantly checked for safety uses along with the greeting at the visit for another bottle.

*The way they treat you was like pharmacovigilance, which they constantly ask you about consumer feelings and effectiveness when you opt for another bottle for next two months, four months, or six months of continuation. Education was not seen as one time deal where they explain everything and let you go on with it for a long time. Education was seen as constant interval where pharmacist checks for two to four months you go through and how you feel about its effectiveness. Also, were there any side effects that may show signs of risks for a pause and find out if there's a problem and use other herbs instead. There were a lot of herbs that can help with the stress and anxiety conditions but bacopa seems to have more benefit that suits strenuous worker and strategic planner. It also helps geriatrics in memory and learning too, this was also educated to me because in 18 years a retirement would be soon.*

*Although when the time of COVID was pandemic, some retail stores were limit to entering but consulting was available through a transparent plastic barrier on a table that were use to protect workers from the visiting customer. For the current time, after the government return the situation to normal and vaccines had covered almost everyone, the retail store resume its service to customers. This you can consult anything that is relevant to your health.*

This was the kind of service that people in the metropolitan and vicinity of metropolitan had when they have time to talk with the pharmacist. Although, for people whom lived in the suburbs, retail stores were less busy than the government retail stores, so there was more time and subjects felt more serviced. This may come from the population density around the suburbs were less than metropolitan. The population in Bangkok at the current time was around 11 million people, living scatter among the districts of Bangkok.

Another excerpt from the subjects was that

*“At the first time they were educated about the safety and usage long term. They were quite satisfying with the information pharmacist told. The safe pause in the continuation was for the fact that there hasn't been longer study uses in the extract form, to get maximal benefits from time to time was to let the body return to normal state once a while before continues another long term.”*

Although, the non-extract form was safe for continue for long term that has no harmful studies on longer term than one year, so it was seen as very safe herbal supplement to use continuously. This was seen in many retail stores that there were no certain restrictions on length of bacopa use in the non-extracted form.

The subjects that were educated and non-educated were remind and educate about the same thing but at a level of language that they can understand. Most people when heard about its safety and benefits the first time, 83% felt that they will use it for long term without any hesitation. This were in the working group of metropolitan and suburban. Although, about 12% of these people already use some type of multivitamins, vitamin b complex, or supplements earlier for their stressful conditions. From these people, it was found that 58% had used vitamins and supplements prior using bacopa due to insufficient effectiveness of vitamins that met daily intake requirements but still felt fatigue and tiresome. This was first impression education on benefits for long term use. With the information regarding the group that was giving education continuously was seen as continuous education and received continuous long-term trust from the customer. This was 98% of people in metropolitan, 97% in its vicinity, and 95% in its suburban.

Retired class in the metropolitan, vicinity, and suburban also received the same level of education and benefits but tailored to their pre-geriatric and geriatric



condition. Although more insightful was given to the geriatrics when each of their conditions had to be work through before adding supplement that will benefit them. So, bacopa extract in part was chose for the Pregeriatric and geriatrics by the health advisor and pharmacists. This can derive that it was based on expertise of some people that have good experience with dispensing bacopa and its extract form.

Provincial and provincial suburban has working class was very well educated and inform about bacopa benefits, they continually receive benefits and review of effectiveness of similar patterns that were effective among users. This was in part that demographic usage and effectiveness was important for retail purchase for supply chain. This was among one of the strategies that retail stores in healthcare always ask consumer feelings in order to forecast sales volume. Effectiveness was one of the keys that can give managers confidence in their continuous sales. Also, having pharmacist and clerks ask about effectiveness was one of the keys of effective service that can help customer on their conditions. This was considered as a journey in customer service that customer loyalty was the goal among retailers.

For descriptive statistics, for first impression education there were no difference in educated and less educated group, and were 93% and continuous education in the educated and less educated group, and group were 95%.

Retired class in the provincial and its suburban have similar kind of service in educating patient but tailored to age and existing conditions that bacopa was beneficial in long term. The consumer was very happy with the service they have from the interview. There was no difference in service quality in delivering knowledge in benefit, usage, and long-term self-management among the educated, less educated, and uneducated. First impression factor that makes them adhere to long term use was the benefits for memory, learning, and lessen anxiety. 94% of geriatrics felt emotionally the need to use for long term were and 96% agreed that service led benefits and continuous education with counseling and monitoring were the factor that they felt adhere to long term use.

Countryside having working class that were educated and non-educated, have the same level of satisfaction. But feelings toward benefits in the working class that have education more than elementary school tend to be more than other people. The widespread use of bacopa has enable two types of retailers among the countryside



users, they were non-pharmacy retailer and pharmacy retailer. Although, the benefits and education in non-pharmacy retailer were lesser in knowledge and were purchased from distributors in the city to distribute among people who need it in the countryside. From the interviewed of locals who bought from the non-pharmacy retailer, there were 25 people whom found bacopa was available in their area. 35% of these people were happy for the information they received from bacopa use when they first purchased. However, the use consultation all answered that they get service from retail pharmacy. The purchase of bacopa extract from health store were for adherence to use, when they were not available to visit retail pharmacy in town. The satisfaction in first impression for long term use in working class were 92% for the educated and less educated and 95% for the uneducated.

In impression to use in long term according to conditions it was found that many have impression in educating benefits and continuous perceived benefits and evaluation in long term use.

### **Do you feel more adhere to using the pill after you have been educated on its use and benefits?**

In impressions on the education that were given to metropolitan working class, were very happy on the information of effects and long-term benefits. The patient felt adhere to use continuously to reach the time to benefit after an initial use. They found that after an initial use of 2-3 weeks, they start to find the effect better with the extract. There was no difference between educated, less educated, and retired in adhered to the pills, even though the severity of some were different from each other. A table below can summarize information found. Adherence comes from the effectiveness of the pills alone; this means that the conditions may be more than mild to moderate and severe. Also, the repetitive education also add adherence to the adherence by the effectiveness alone.

The difference wasn't much between the age group and level of education involved. the more adherence was found to be from effectiveness alone from solving mild conditions continuously on an everyday scenario. Similar to more adherence in retired people, the 98 % felt adhere from the first month of use for working people,

and 95% adherence for retired people in the metropolitan. In this percentage, the 2% and 5% missing were people whom sometimes forget to take at usual time and take later during the day and lesser 0.1% and 0.12% forgot to take for one day from misplaced bottle when they usually taken the pills at dinner time. Although, for consideration of 24 hours pills continuation taken within 24 hours' time, it would be considered as missed dose, so efficacy was still there and adherence for the day wasn't lessen, when they resume the pill in the morning. This was found in some cases when reviewing the web system interface for consumer usage and synchronization with retail store for adherence review by pharmacist and clerks.

Provincial and suburban whom were working people, these people show same opinion about bacopa extract effectiveness that were use for people whom were wage worker and managerial. There was no difference in non-retired and retired people within the study regardless of gender and marital status. Although, large percentage of these people whom were wage workers seems to be taking bacopa extract in the evening and less people tend to take bacopa when they wake up with a cup of tea or coffee to prepare for the morning work. From these people, there were 32.44% people whom take bacopa for strenuous task during the day and 67.56% people take bacopa for mental recovery, stress, and anxiety. This shows large percentage in demographic population that pandemic causes stresses in people whom were wage workers. As it can be described below.

*I have to complete project in time, the company had laid off many workers to sustain their expenses and more jobs were put to people whom know more functions and more experience than others. This causes delay when there are no helper and less worker around the project. It causes stress when jobs weren't finished on time and multiple sites had to be check before handover the finished project to owners.*

This was a job involving internal decoration of retail stores in provincial area. It did not involve much but careful work requires experience in renovation and installment of equipment for use in retail stores. The project manager and workers had to travel around town for projects waiting to be finished. From this, when the day is done, they usually take bacopa extract for continuation of project checking and revises after dinner. It also calms them before going to bed, reducing anxiety and better recall for ideas. The education on beneficial and long-term self-management

also helps them to use the bacopa correctly for their condition for strenuous work or for anxiety and memory improvement. This helps them to use bacopa correctly in at the starting point. Even though there is no different in efficacy of bacopa extract but usually the time that extract concentration seems to be high and replenishes mental state was near the time of taking afterwards. When the extract work according the suitable use, it also reminds consumer to adhere to usage for the indication set forth by the pharmacist and clerks.

This can be summarized that the subjects in this study may come from a very hard-working condition that continuous work causes recurring fatigue that needs supplement continuously. This was seen through working people and retired people. It is also found that adherence from these group also comes from the habits in working, this was seen in 38% of people who are working people in metropolitan, they usually have bottle at their desk at home or in their carrying backpack. It was habitual that they take these at the same time every day and also people who were managers, usually have small pill carrier that is strap to their work calendar. The study was found that managerial people also have the kind of attitude similar to the study found in recent study, and this study found 47.33 %, 115 from 243 people in various managerial, executive, and government sector that exhibit mindset that they were in control of the situation and having multiple memorizations of things tends to make them more control, make them feeling better when they felt they have managed themselves correctly. The bacopa help them with anxiety that lessen stress. Less stress enable memory and learning to be enhance, this completes the cycle how hormonal may be detrimental and lessen by bacopasides effects.

*When you were under stress, you think and think and think about the things you were put under pressure on. The circumstances, how to work out each event and things involved. When you were deeply into it, you forget all of your surroundings and then some of the things you learn also forgot. As the work doesn't clear things up, it will continue to deteriorates your short-term memory. Bacopa helps with memory and learning, maybe it helps through reducing anxiety and stress. It is quite effective with the current long-term use.*

This can be seen that it helps people in managerial jobs and strenuous worker that depletes physical and mental power on an everyday circumstance. The research

along the countryside have not been different than the people in the city region and metropolitan. Although some of the adherences were better when they can remember that the health store that sells the product, they use continuously have product available all the time, this also contributes to the adherence in continuation usage. Although, the number were really small as users with health store near them were in some local areas. The beneficial factor educated from local health store were similar in retail clerk level where effectiveness, safety, and usage can be discussed at some level. Although, higher clinical outcomes with other beneficiary vitamins and drugs can be found in retail pharmacist consultation.

The patient whom received beneficial discussion at the retail pharmacy can be summarize that they know how to use, time prior beneficials can be seen, how long to use, what can also be use with, and when to stop when side effects may happen, and how to pause for minimal amount of time when considerable amount of time has been spent. In the people who were retired, these people when entire geriatric age, some have had begun minor memory loss. It was taken for the prevention of further loss in short term remembrance. The bacopa extract were doing very good, when asking the 153 people from the geriatric age, 90.19% respond that the bacopa extract tablet was better than non-extract capsule form. Also, the effectiveness alone was responsible for the adherence. The education and beneficial information made them adhere to use correctly from the point that safety in long term use was concern. Although, the length of after 1 year in use, when to pause is up to the patient alone when there were signs that could show when long term side effect begins, if any. This was similar to some pharmaceutical drug use that physician may pause for a while and begin again.

This is important when adhere to correct use, it would prevent consumer to avoid using when they don't know some long-term side effects isn't permanent. So, this can prevent some people who did not know and think they were allergic, even though it was minor side effects from long term use. This would prevent less educated people, non-educated people, and educated people that they weren't aware if pharmacist didn't tell them. It would prevent profit loss for the government pharmaceutical retailer whom were leader in bacopa extract products in Thailand.

**Please explain if you have barriers with using computers and smart phones to access internet**

From evaluating 1268 people, there were little percentage where they use computers for entering the input data into the web system. There were some discussions about the reason why they don't normally use the computer for using the web system. Most reason is that smart phones were cheaper to buy, since most available decent Chinese phone were normally under 4,000-baht range, so it is affordable more than computer. Also, some of the internet doesn't go into countryside that some requires internet satellite dish. Many people in the countryside do not use computer, mostly watch TV and some have house phone at home. Also, people who has computer tends to be kids in the house that use laptop or computer. However, it wasn't a barrier to internet connection when the smart phone is available for social networking, internet browsing, and web transactions for android and iOS application.

All of educated, less educated, and non-educated were equally accessible through internet using smart phones. This applied to metropolitan, metropolitan suburb, provincial, provincial suburb, and countryside.

During the research, there were some internet disconnections on internet SIM that were in several smart phones in provincial suburbs and countryside. This happens sometimes for some amount of time, although with the mean of 2 times during 6 months interval. Each disconnection last less than 30 minutes. This may come from the network area that had hardware upgrades, system checks, and fixes by the technicians. Although, this wasn't a barrier but the web input may be delayed for some people whom take the bacopa extract pill but had not scan sticker on the bottle.

Another barrier was education barrier, for people who were more than 80 years old. Some doesn't know how to use smart phones or was too old for accessing the technology. Minimal people were uneducated, they do not know how to read. This account less than 2.05% total. However, in taking the pills and scanning the bottle for intake were done by grandchildren at home whom help their grandparents completing each day jobs. From these 26 individuals, were scattered throughout metropolitan, provincial, provincial suburbs, and countryside.



With the barriers involved, future accession to web system may be utilizing the android application in a fashion that is push and go. Since they can't read but simple sign can be use instead. Modern smart phones have ability to change settings where colors can be tailored to viewing, since some people can be color blinded. The application can be tailored to people who have visions problem also, if any for the visibility of icons that is use in future applications.

The last barrier may be limiting physical movement due to fragileness of the physique involved. Muscle movement may not be as strong as before and some were stay to bed all day. These were some barriers that geriatrics have but were helped by young grandchildren at home who were able to use smartphones. This can be seen that Thai culture were people of friendly and kind, were nurtured from child to adult that bears family.

Barriers from language process and memory of chronic individuals were also observed within the study but there were none in retired group. However, in the geriatric group with age more than 80 years old, there were some people whom can't read or write but their memory was still good. However, 5 people were very fragile that they can move slowly.

**Please state how long have you been using the product, usage frequency, and lifestyle involved and how well did web tracking conveniences you.**

Although the launch of bacopa extract has been continuously produced and sell continuously, regions that were scattered first were Metropolitan and its suburbs and extensively scattered into the provincial areas and its suburbs, and countryside have been available for more than 2-3 years prior the research. People using product for more than 3 months were retired and non-retired people that were in metropolitan and its suburbs, provincial and its suburbs, and countryside.

From the interview, the worker people start their regimen mostly from pharmacist advise after they ask the pharmacist for supplement. Some came from an internet news and medical news, similar to retired people, which they have time to read news and watch medical news that have supplement to help their conditions. Although older people seem to be more news directed to retail pharmacist more than worker whom show signs of stress and fatigue.



The frequency of usage was once a day for long term, for people whom were more of strenuous job usually take the pill in the morning and stressful people usually take in the evening. There were number of people whom start earlier for 3 months already and enter this study would result in continuous 9 months or less, but safety was observed with all subjects with good results in the effectiveness and continuous improvement in anxiety and stress. Memory learning was also observed with consumer in stressful and retired people. The number in demographic study, the months before study can be found in the table below. The list contains area involved and months before study, this summarizes the data that prove safety among users with mild to moderate and severe conditions.

Lifestyle of most metropolitan were mostly waging worker, managerial, business owner, and government. For non-wage worker that uses their physical for strenuous work, some people in managerial and business owner have participate in sport club activities, such as aerobics, weight lifting, badminton, tennis, treadmill, and swimming. Although, these weren't daily activities but found to help bacopa in relaxation and mental stimulation in people with stress and anxiety. There were also amount of people whom still participate in sport club in provincial area after work that group activities were found to help team work better; however, these were seen in more educated people whom work for businesses and government. For countryside, sport activities such as soccer, basketball, volleyball, badminton, and tennis can be seen in after work activities for some people.

Some people in metropolitan, provincial, and suburban have parties sometime and found that bacopa extract does reduce recovery time for alcohol hang overs, when they don't drink again next day until next week. This help wage workers and strategic planners whom were frequent party-goers along the Fridays to recover within few days.

*Bacopa has help me with lifestyle of working strenuously and socializing afterwards in some occasions. Bacopa also help me recover from alcohol consumption after next day. I usually take them in the morning and it help me recover better during the week ends.*

People whom were in metropolitan have no problem in using web tracking, as smart phones were part of their live when they go to work, receive news, connect

with friends, workers, and family. The social network plays very important role in their lives. The use of smart phone was not a barrier or problem to their usage in accessing the web system and information about long term use.

*The web tracking was very nice in a way that is easy to use, you can access it as many times as you want and click to see calendar of how long it has been taken at what time. The web page return results very fast and the whole page was similar to social networking but it is not. Although, the user can contact researcher using other methods of communication, a direct Line communication in android or iOS application. This was convenient as the terminal connection was very fast and able to use video call for showing or short communication during whole 6 months of research progress.*

It can be seen that the web tracking was very to use, although there wasn't much to explain that why it didn't use a more sophisticated web system even though it was available for use by the website service provider. This was because the research aims at using the small web page to incorporate into a small server system in the future that uses SoC on chip that reduces power usage and optimize for small businesses that doesn't have money to provide for continuous electrical power but still want to provide a group customer in their area. Later it could be connected to many areas network that make a large cluster that services large customer in a countrywide manner, similar to decentralization of government power in large country.

The convenience of web tracking was seen among wage worker in metropolitan, provincial, and its suburban when it is accessible through their smart phone, tablet, laptop, and computer. Subject in the countryside were also seen web tracking as convenient when use their smart phone. Subjects in this study agree that it was convenient because, smart phone was seen as all-in-one place for applications and internet. The ideation of all things in one place was similar to modern internet applications worldwide such as Google's and Microsoft's online application. Everything of a business is in one place with all business security transaction applied. The opinion on convenience had no difference in male and female observed, all were agreed that it was convenient to use and keep track of usage data. This enables them to make judgement upon the length of use for bacopa extract and continue later to benefit the most along the aging process.

The web tracking not only convenient them but also help them make better judgement on the continuation period and going back to review length of use for next continuation. This congruence with the education from the retail pharmacist education. The action of bacopa users can verify that subjects among each demographic area were listening and following instructions from retailer's education and consultation services.

**Please give reason why you continued or discontinued to use the product, even though you have quit using IT system involved.**

Subjects enrolled in this study did not discontinue or quit during the entire 6 months period. All 1268 continued their uses of bacopa until further discussions with retail pharmacist where they bought the bacopa extract bottle. The usage of IT system involved in web tracking were continuous, with some forgotten to enter data in a non-continuous two days interval. It happens one day in a while for 15 subjects involved. When check back with each subject, most forgot to enter the data while scan the bottle but look at the calendar and check for usage data from the past months. This was a way to check that long term efficacy took how many months to reach this point of better memory, learning, as well as safety of use. Although, this happened only on the 4<sup>th</sup> month of the usage.

**If you have problems purchasing the merchandise, do you think web referral was a good alternative way to purchase product? Please state answer.**

From subjects in metropolitan and provincial see it at good alternative when they were busy with their schedule and work for groups in management area that were non executives rank. This was also seen in retired people in metropolitan, provincial, and countryside. The advent of internet banking and digital enables electronic wallet to purchase for e-commerce. It was available from many private banks and commercial banks for common people to use smart phone for electronic purchase processes. People in the countrywide can use the electronic payment to purchase bacopa extract from government retail store and retail store within small town in countryside, provincial and its suburbs, and metropolitan and its suburbs. Tracking of

small goods sent from retail store can also be check by using Thai postal service smart phone applications. If sent by other couriers, it can be check using courier's own smart phone applications, such as FLASH, J&T, KERRY, DHL, and so on. Purchases can be made through retail store available online channel such as Facebook or its own website that has purchase applications through the electronic payment. Modern electronic payment system can be webhosting provider e-commerce module or standard QR payment that process payment into bank account or retail owner's digital wallet. This practice can be seen widely in Thailand in a country wide manner. So, this means that less educated people who were able to read and write, can still make purchases from online source.

Information on subjects who made purchase through online source is available below. The tabular show number of people whom uses the purchase before and would continue to make purchase next time because of their unavailable time to go to retail store or the distant to store was far and current income may not be economical to visit town often. Also, when some of these may feel considerate to use neighbors often to purchase things in town. From the fact that the Thai postal office was available in each small town, the online retail shipment provides another route for customer order to continue their bacopa extract uses.

One of the retired subjects in metropolitan describes web purchases as modern and easy:

*Initially, I was browsing through the internet browser for geriatric supplement for memory improvement and was brought to online retail store that was owned by GPO. The website was very good in information and easy to browse for the supplements. I was able to make purchase through the online retail store easily using digital banking and it was sent to my house in less than a week by the Thai Postal Services. The process was easy, if I am home and didn't go anywhere for at least half a month. I would order again.*

It can be seen that the purchase was easy and if she's available at the time of goods received, she would certainly buy it online again. This was the fact that it doesn't require much time on traveling to get through the retail store. Instead, the product comes home with just simple clicks.

Another in the provincial suburbs describe the same thing with web system from the research involved:

*I did a few orders from retail store online from GPO, with the web referral button from the web system research by clicking at the refer button. This integration makes it easy for the subjects to continue their purchases and makes it easier for managing adherence in the future. It provides convenient in a way that when you check the calendars and check amount in the bottle, the referral button is next to it. You don't have to scroll to pages before to make purchases. Everything was on one page that convenient users.*

The subject describes as referral system built in with calendar and check system of bacopa usage was very convenient and manage consumer better, this also pave for new management system that may be channel into more than two products in the future that suits customer that requires different bacopa formulation. For example, from the teenage studies, bacopa extract was in a range of 225 mg per tablet, GPO bacopa for adult was 300 mg, and in the future different formulation can be made to suit each consumer within the web page tailored to each person.

Another subject living in countryside also reveals that web referral was good when she felt she has another way to getting the product when in the future there's no other alternative to reach the product, such as unavailable people for help within future time, such as when all the kids go to college that is in the metropolitan.

*The web referral is another alternative for me in the future, when all help would be lessened when all of grandchildren goes to school in the future. I can make a purchase once for half a year or the entire year from using the web referral after I check with the calendar and usage status. it is very easy to use for me for the web referral and the retail pharmacy online from GPO.*

This can summarize all group of consumers countrywide that web referral was convenient for them to use as a check system, calendar system, and links to next bottle purchase at retail online store of GPO.



**Would you regard the product as essential item for long term use with web interface? Please state why do you think so?**

In an all-round interview of 1268 subjects, people whom were acquainted to internet technologies in the past 20 years seems to affirm the web system was essential to using bacopa extract. However, geriatric that were in aging more 80 years old felt more that web interface could help them with regimens drug use in the future as a medical information for use with doctors. For people who lived in the metropolitan, provincial, and countryside felt differently than the chronic conditioned people.

Metropolitan and suburbs subjects felt that the web interface was essential of keeping track of their intake and long-term effectiveness. With educated that it can be taken with modern medicine, some felt that the web interface and data input can suggest help for their conditions in the future and may be vital for important medical research when they take bacopa with certain medications such as diabetes, hypertension, and neurological conditions that hinder their fatigue. So, as a benefit to social mass in the future, most of these people feel responsible for their actions in the society. This can be account for 385 people in the study who has chronic conditions and chronic disease that may cause other conditions that can be alleviate by bacopa extracts.

*I think that the web interface works very well, when you use it the first time only takes less than one hours to figure out all of its functions, very robust and isn't complex to work with. Some interface has more buttons and sub functions that you can use to approximate dosage interval and long-term timing for memory and learning.*

This was like many people in the study where the it was agreed that there needs to keep track of things for future keeping track of expenses and information for medical uses in the future when review by doctors. The keeping track of expenses were good thing when it is needed for socioeconomic of self-review whether some vitamin, medicines, or herbal supplement use together would be economical for continuation of self-medicated in long term. Although, bacopa extract would be a main long term herbal supplement for them but keeping track was to make sure that



their usage was kept a documentary. Also, further needs were that when bacopa is use with other supplements, in the future there should be a place for other nutrition supplements, vitamins, and medicines for keeping track with also. This way, users can determine their expenses and effectiveness of various medicines, supplements, and vitamins together.

*The web interface has help me feel like I am doing something that can make my days better and other people's days better in the future from future use of my data. The web interface convenient my day and review of myself of what I take daily. Sometimes, I scan the bottle and write my diaries afterwards, so I can review my feelings and conditions with my diaries and web interface calendars. This helps me keeping track of my diabetic conditions that sometimes worsen my limbic nerves. Bacopa extract also help with my memory that sometimes I know what to write on my diary, it improves my recall and better the learning of things.*

In examining the people who was sure that it was for long term use. The question that was used was for the continuation of GPO bacopa extract only that has web system like this for its customer. Although, not include that if competitor's brand was involved in shifting product use. From the interview, there was no difference in uneducated, less educated, and educated among the three large regions of Thailand, these were metropolitan and its suburban, provincial and suburban, and countryside. This was regardless of gender and education level. Although, there were minimal percentage that they were uncertain that they can continue the usage because if their grandchildren left for education in large cities, they might not be able to use the web page correctly due to their physical deteriorations and vision. This was account for 1.42% of total population. It can be summarized in a table below.

All the age group mentioned, all of the special subgrouping of people in working class and retired class were included for all conditions that they use bacopa with web system. The groups were usage for memory and learning, forgetfulness, physical mobilities, anxiousness was decreased, chronic disease and conditions, preventing of health deteriorations, mental stress, and strategic planning. From mentioned, it can be summarized that the web system was need for many reasons. Not only web data can keep track and review expense but also has ability to use for

medical intervention in the future when they visit doctors at hospital and clinic. Also, the data can be review by pharmacist that were practitioner of herbals and pharmaceuticals. The future of online computer system holds much potential for consumer use, safety, and medical intervention that will help their health in the future by physicians and pharmacists. This derived the sureness of continuation of use for many people who were consumer of bacopa extract. Although, with the mindset of knowing the importance, it can be concluded that consumers who were adult were people of social responsibility at large scale, hence can derive that Thai consumer were reasonable people.

**Will you be using the item in the next 5 years with web tracking if it continues to convenience, you and do more things in the future?**

From the prior interview that involve using web tracking together with bacopa extract, it can be conclude that within the next 5 years with the population of subjects in the study of 1268 people, the continuation was sure for all subjects. This is that the effectiveness for their conditions were very good, although some people had taken for longer time to see the effects, especially in the diabetic and stress groups. One of the factors that affects their time to effectiveness of minimizing stress and increase memory and learning was the waking time and sleep time interval. People whom had chronic sleep problems from anxiety took some time for the conditions to decrease with the benefits from bacopa, then when enough rest from better sleep begins to show continuously, they were able to benefit with other effects of bacopa.

From the view point of 5 more years usage, non-retired people in the metropolitan and suburban feel that it was crucial that they won't forget to take the extract because they have something to do with the product that they are taking. It serves as another reminder to do things when they begin the day going to work and others work before they sleep. This can be said that people who were active with working, feel that computer usage and smart phone usage was vital to their activities and work. It feels like digital age that is bringing people around the world together and closer. Similarly, when all computer systems can be interconnected through

services, this can give forward to information mining for advancement and better research for healthcare.

In country and business transactions, services in computing such as Nvidia, Google, Microsoft, and others seems to have similar model in providing services together that can push education and research forward. Although with supercomputing, the rise of Chinese supercomputing business would be similar to Nvidia in the present where clouds computing of advance chips made way into computing for research purposes. With the web tracking that subjects were acquainted to in this study, would give rise to information that can be mine for healthcare use. This can benefit the country as population in the country continues to increase forward with digital age. The web system can migrate to small robust system that uses SoC with minimal power require to sustain small business and form larger business at cloud connection scale, direct interconnect or clouds system offer by Google and Microsoft using very minimal cost per month. Later, more robust system can be made into Point-of-Sale system that utilizes very small SoC for Point-of-Sale system then sends information to IBM mainframe system that can process business analytics using built in A.I. chip in the mainframe chip. This reduces work time in very large Human Resources department. This would make a good use of current SoC chips that needs engineers to pick up and build system that make way for future SoC chips that can handle more advance functionality that can drive chipmakers to make reasonable chips for business use and consumer synchronization.

From this point of talking to interview individuals with their social responsibility minded, were assured that they would definitely be using this system for themselves and for the good of others in the future when they heard that data mining would be beneficial to medical research for others. Also, with the functions to be add in the future that helps with recording more vitamins, supplements, and pharmaceuticals, when they heard about the functions this also made them more confident about sureness of continuous use.

A summarization of group of people can be categorize into 4 different opinions that can conclude the situations found in this topic of interest on more things

that they need if continued in 5 years. The groups mentioned were largely non-retired and retired, mixed age and gender, regardless of income level.

One group mentioned: *I would definitely use the system for more than 5 years if it means something to me and others for the data mining that can be use for medical research and also current use of supplements can benefit me when doctors review supplements and medications.*

Another group mention that: *I think that the web system was easy to use and robust already but it would be good to add a few function that is usable and made more information visible for me to use. However, too much function would complicate things that it can lose consumer attention, meaning that they won't use all of the functions provided by the application.*

Another group with retired status mention that: I think that the web system that can connect to android and iOS applications, would be easier for me to use. Although, the web system was already easy to use but it would be better to use the android application to click scan the sticker and makes it easier for storing usage data, sometimes I would like to review offline or when the connection in area where the telephone signal wasn't strong, it can be store into phone first and then send information later.

Another group mentioned: *"I think that when mentioned about android and iOS applications, it would be very reasonable that it is easier to use smart phone applications. A lot of web browsers doesn't offer privacy and many uses cookies to follow users, for their analytics. Direct smart phone applications and connection to web system in the future would be useful.*

From the four interviews, we can see dimensions of needs by people in the research. This also give reason for future research that can be made into finding better customer satisfaction and behavior towards using different types of information interface for communication and processes. This can serve as all-in-one place for reaching healthcare information, healthcare needs for contacting pharmacists, and clerks. It paves way for a lot of things such as tele-pharmacy, telemedicine, and medical research.

Other things that can be found was that with educated people, they also know about personal information privacy. Certain system also has analytics that can share information and certain information made to a server in one place can send connection statistics to another server, which can result in less privacy for some people whom mind their activities not to be follow.

From interview, tabular data below shows that all subjects regardless to age and gender and location of living, all agreed that in 5 years they would still use the web system for their own purposes and future use in medical service towards them and research towards society as a whole.

<i>Demographic</i>	<i>n</i>	<i>%</i>	Sure / continuation	Unsure / discontinuation	future
<i>Metropolitan</i>	286	22.56	100%	-	
<i>Metropolitan Suburbs</i>	373	29.42	100%	-	
<i>Provincial Urbans</i>	108	8.52	100%	-	
<i>Provincial Suburban</i>	213	16.80	100%	-	
<i>Countryside</i>	288	22.71	100%	-	
<i>Total</i>	1268				

**Please explain if you have any problems concerning the usage of web-based system.**

Subjects living countrywide in metropolitan, provincial, and its suburbs have no problems using the web system. Subjects living in the countryside also have no problems with using the system, since the word used were in a level that less educated people can read. The system and buttons were legible with no errors in processing web pages related to calendar and number of pills accession. Also, the web referrals also work fine with the system involved with the data systems.

The web page successfully launches every time when accession begins with the sticker. Although with some case that sticker on the bottle may fade if continuously boggles with the bottle inside a bag or a purse, the subjects were warning and suggest that they cover it with a tape or clear sticker. This was in the second half of the subjects enroll paper, where the clear sticker was short of availability. So, in the study there were only a few hundred that needs to tape. When interviewed, with 1268 subjects there were some checking with the sticker problems and found that some subjects that received non clear stickers didn't carry bottles around in their bag but put together with other supplements inside their cabinet or on their desk at home. Some put near their bed and take the pill before sleep when reading news each day.

There were also few people in terms of privacy, a total of 148 subjects have contacted directly through telephones, LINE, and at direct interview that the research was a type of research that sells personnel data and market data to private companies and were answered that it was for research study for the university and for the good of Thai government retail pharmacy system.

With the use of web-based system brings no concern in normal day usage, but people were concern about if this would go on in the future as a more develop form in the future at the government retail store settings. This is because it was relevant to them when they use it for many months already and their information was stored, some were asked if they can print out later for use and it was provided to them after the research was finished in PDF form.

With no concerns on the web page process and data system usage, this marks the successful launch of web tracking system that can be use and make better of versions to suit more consumer, their health status, lifestyle, and future healthcare with provider.



**Do you feel more adhere to product use when using web-based system? Please explain.**

It can be summarized that in 1268 subjects involved in the study using web base system, found more adhere when using the web-based system by the use of easiness when use in conjunction with scanning sticker on bottle. The scanning takes them to web system where they can visibly see their usage and review their ailments with the efficacy and expense used. This presents socioeconomic data in some way that it helps with their situation. Also, when interviewed personally, all were satisfied with the web system and felt more money worthed the purchase. This means that the bottle comes with the user-oriented web system that enables consumer to review their usage and present data to healthcare worker elsewhere, be it hospitals, clinics, or pharmacies. Some people feel more adhere because they have something more to do with just taking pills. With the system, it also means they are taking care of their future self, when it comes to patient review with doctors, history of drug and supplement used, and conditions that they have worsening or needs some type of medical care.

*After finished consulting with the pharmacist, I began to realize the importance of adherence taking bacopa extract because it takes time to begin working. The web base helps to adhere to use, when it also reminds that bacopa needs to be taken every day and when you do it every day it becomes a routine use, like brushing teeth in the morning. You'd remember it if you didn't take it because the phone is with you all the time.*

Many consumers said the same thing but also added that *“Although, it would be access if android mobile application was made a launcher to open the web system. With the current system, a scanner system is also available but were native applications of android phone and iPhone.”*

This was something that subjects mentioned, though it was perceived that making mobile icon to start application would feel more involved with the web system. Although, making a mobile application that work as a link that opens a web browser that opens a web system would cost additional time to register applications

for the smart phone operating system. With the explanation towards the subject's perception earlier, the subjects were understood that making the icon that opens web browser for the web system wasn't necessary and they were using the core system that is efficient already, through swiping down their android phone that has readily available scanner for use. However, with android similar operating system would have their scanner elsewhere indicated so it doesn't run into intellectual property issues that seems to be problematic in business worldwide.

This was one of the consumers whom had opinions on their adherence, there were a group of people whom felt that they feel more attach to brand use because it offers web system for self-management, these were 682 people from 1268 subjects. These were 180 subjects from metropolitan, 153 subjects from metropolitan suburbs, 108 subjects from Provincial city, 143 subjects from provincial suburban, 98 subjects from countryside. It was confirmed that their attachment was from first impression of after care service with web system for long term use.

From the web system data, there were only 5 people whom missed their input 2-3 times within 6 months in the study and 8 people missed 1-2 times within 6 months. When asked for 5 individuals, they were forgotten to click the submit button after they review and sometime forgot where they put the bottle. However, they were able to take it in the morning, so the dosage interval for effectiveness was still good to take. In 8 people, the missing input were from reviewing and didn't click submit button, similar to 5 individuals. So, this can be concluded that the subjects were able to take the tablets within the time range for continuous effectiveness with the extracted tablet form.

The interview was able to verify that 1268 web system users agree that they were adhere to web system use that strengthen the adherence of bacopa use. Although, it was to also be account that effectiveness of bacopa also help with recall in long usage. From this adherence point, can be classified into routine behavior, self-care responsibility behavior, and adhere to use behavior by ease of use, adhere by digital usage.

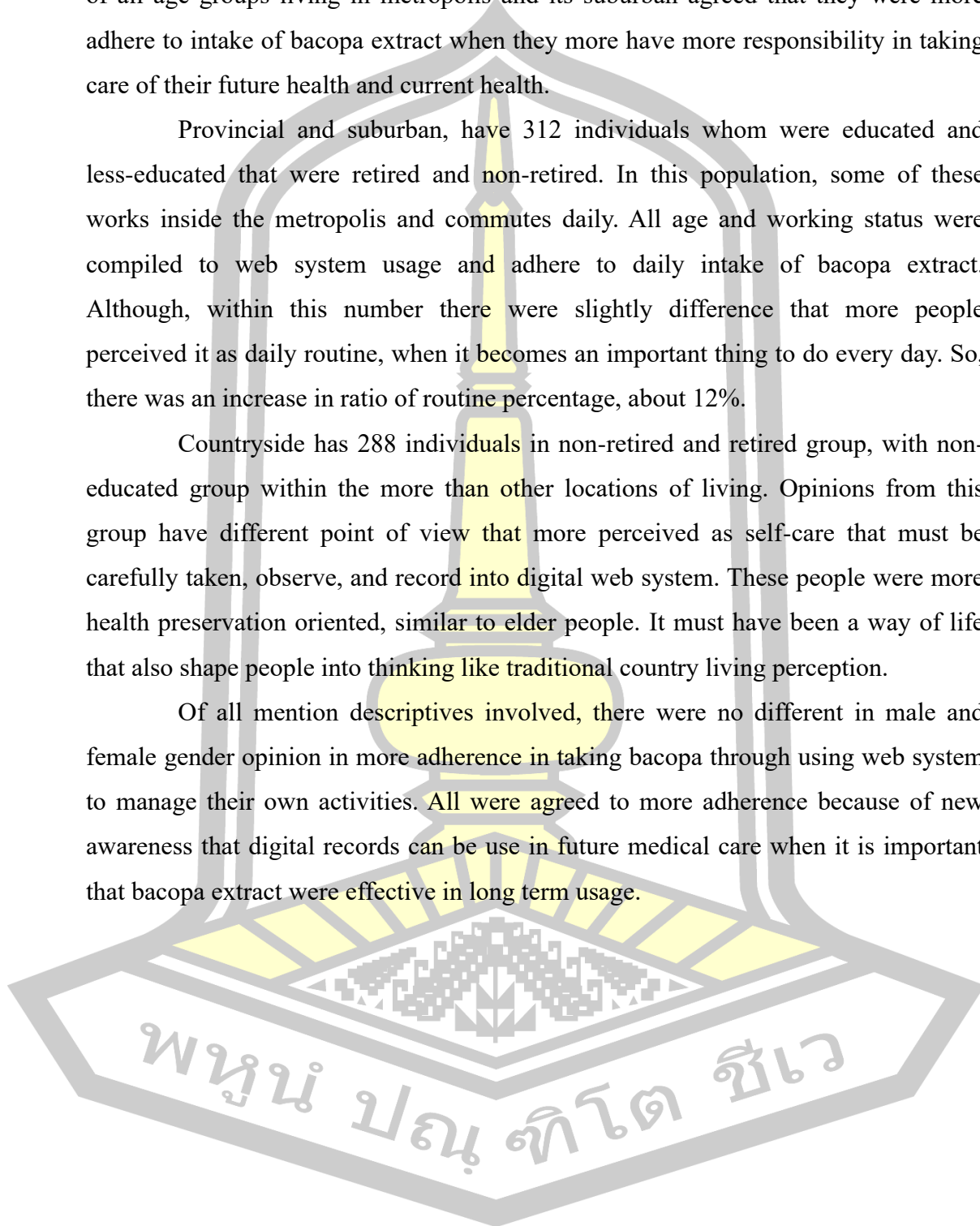
Metropolitan and its suburban, in the educated group and less-educated group there were no difference in adherence to use the web system and bacopa intake. This also applied to non-retired and retired individuals. All were complied to usage of

digital technology to accommodate their intake and records. A number of 659 people of all age groups living in metropolis and its suburban agreed that they were more adhere to intake of bacopa extract when they more have more responsibility in taking care of their future health and current health.

Provincial and suburban, have 312 individuals whom were educated and less-educated that were retired and non-retired. In this population, some of these works inside the metropolis and commutes daily. All age and working status were compiled to web system usage and adhere to daily intake of bacopa extract. Although, within this number there were slightly difference that more people perceived it as daily routine, when it becomes an important thing to do every day. So, there was an increase in ratio of routine percentage, about 12%.

Countryside has 288 individuals in non-retired and retired group, with non-educated group within the more than other locations of living. Opinions from this group have different point of view that more perceived as self-care that must be carefully taken, observe, and record into digital web system. These people were more health preservation oriented, similar to elder people. It must have been a way of life that also shape people into thinking like traditional country living perception.

Of all mention descriptives involved, there were no different in male and female gender opinion in more adherence in taking bacopa through using web system to manage their own activities. All were agreed to more adherence because of new awareness that digital records can be use in future medical care when it is important that bacopa extract were effective in long term usage.



Demographic	Education Level	n
<i>Metropolitan, all age group</i>	Some-educated	to 286
	Educated	
<i>Metropolitan Suburbs, all age group</i>	Some-educated	to 373
	Educated	
<i>Provincial Urbans, all age group</i>	Some-educated	to 108
	Educated	
<i>Provincial Suburban, all age group</i>	Some-educated	to 213
	Educated	
<i>Countryside, all age group</i>	Non-educated	to 288
	Educated	
<b>Total</b>		1268

**Please state how do you feel when using web-based system in long term.**

Metropolitan and its suburban consisting of 659 people in the educated subgroup, there were 544 individuals that feel web system were essential to living in metropolitan and people whom commute between two locations of suburb and metropolis. Some of these people take it at home before going to work, a few check their calendars on the van and buses to work in the city. It has become a part of their life, just within a few months of use. For most people, they take it in the early morning or evening, when they have to drive to work, send kids to school, or have stressful workdays and take bacopa extract to help them sleep better long term at night.

*The web system initially, feels wonderful when you use the web system. It is nice and robust, with just few clicks you are where you need to review your supplement intakes. Which makes me feel well, and the consultation with pharmacist makes you feel how to use it correctly. Right now, I take it for memory and learning, if I have stress and discomforts in the future from work, I might use it after dinner. This way its strength of bacopasides may relief from stress better in dosage readily available in effectiveness after taken.*

Individuals whom were educated, were people who knew what can be done more to their life by using digital applications for their life and work management. It seems that 544 individuals were more happy than other people because in the city, there has been many services that has been digitize in private business, banking, finance, and government areas. Although, there hasn't been much digitization of medical services, this research has been very helpful and thankful to them. As a result, the score on satisfaction was very high in all interview. This also happens with every people who were educated and less educated in this research, regardless of location of living. It was seen as a help to all of them, in a part of their life that they didn't have an opportunity to present medical information to physicians on supplements and duration taken.

As for the working class that weren't retired it can be seen among metropolitan, provincial, and suburban of both location of people that web-based system was important for their medical information presentation needs. It was assumed by people that it would be important to them in hospitals within 2-5 years for geriatrics and 10 years for retired individuals. Although, all of these subjects were going through pharmacist education and consultation from time to time, all were able to talk about their experiences and effectiveness of bacopa to physicians and healthcare workers. Also, with information presented in clinical background long term use, it can be used for future medical research that can help society as a whole.

Provincial and suburban feel that it was seen as a long-term self-care system that it is important to use and record for future purposes and self-evaluation of supplement effectiveness for the condition that is worsening from aging and strenuous work. Most people whom were in the provincial and suburban area were felt appreciate by the retail that they received extra service that help them going through healthcare as a journey. This wasn't retail from government but a family pharmacy that was in town for a very long time. This can present some information that long term satisfactory in GPO products can be continued with the help of family retail pharmacies in each provincial, capitol city. For the retired group in the provincial, they feel good about having extra service that comes with the product, it was seen as extra product for them to use. The opinions from retired individuals and wage workers were the same that:

*The web system works great, it has functions that I need. It has calendar to check that each pill was in place at what time, able to calculate day to day in a long term that can continued and re-continued. It was for safety reasons to be pause for number of days, when it is alert by your physique. Sometimes, if the extract dose is high for some age range and physique size, it can be adjusted by pharmacists advise.*

This was an interview from people in the provincial and suburban, whom usually have appearance smaller than people whom were wage workers and retired. The average height and weight of people in the former days weren't very high for Thai people. Also, most people in this study weren't obese at all. There were some that only weight more than 80 kilograms, which account for their total body mass but their height was tall as well, This account for 4.89% of people of 1268, or 62 individuals. Although, the dose taken were adult dose of 300 mg and have no side effects that was seen. There was no need in dosage adjustments for adults that have weight and height similar to teenage studies used that requires less 75 milligrams less of bacopasides extract. this represents that the aging does have effect on bacopa effectiveness and reduced side effects seen in teenagers in long term use.

Another subject in the suburban of provincial advise that it would be better if the web system has an android application for his phone, because when he goes to work in remote area further from provincial suburbs, there seems to be less cellular signal, so if the application as built it would ease his jobs during the days that he had to go to work in far area.

*Whenever I go to work, there were site that doesn't have less cellular signal, I had to access the web system before going into far area. This seems to be slow in putting the information inside the web system. Although, in the calendar system there's a page available for correcting dose when you don't have time or current access to internet. There was one time I scanned and had to leave the web page open until came out of the site, then the button can be push for submit. It was a bit 5 hours late from taken time.*

Individuals residing in countryside areas have feelings that the long-term using is good to their health in the future when they go to physicians and pharmacist. The information presented in the web may help pharmacist and physicians make. It was very surprising for them to know that there was technology like this available for



supplement use. It was quite new to them that it was first used with supplements. However, they also don't know that it was used in medicine also because there wasn't technology available in Thailand where countryside and some provincial where higher education may be required to access applications that uses English language. However, applications in Thailand for drug management were available at service in some private healthcare settings and working towards government provide for hospital use in the future.

*I was amaze at how the smart phone that I use can track what supplement and with explanations from pharmacist, I can use this technology with my supplement regimen with less anxiety on the future discussion with doctors when my conditions can get worse from aging. With the question mention, I would continue to use the application for 10-20 when still taking bacopa extract for my deterioration and anxiety.*

This was one of many people whom had used the extract and was advise by the pharmacist that they can keep track of information and present to physicians when data may be crucial for combined supplement and drug use for deteriorating condition.

With locations of living mentioned from the study, the scattered pharmacies have presented some culture effect on opinions about feelings on long-term use, within the area for each part of Thailand. The areas covered were southern, central and vicinity, and northeastern of Thailand. Each individuals' opinions seemed to be affected by the way of their living, influenced by local traditions, elder-taught, and viable knowledge that can be obtain through socialization and digital networking of friends, colleagues, and people at work.

**Please explain if you have barriers with using computers and smart phones to access internet.**

Personal computer has been available from time to time and the use of internet has been around at least 30 years from currently. There were no problems in using computers and smart phones for people who were in the study except for some of the 2.05% geriatric in the study whom were having family members helping them

when they were less mobile than before and language were barriers that was important for use with computers and smart phones.

Internet access was readily available throughout the country, there were times when individual subject went to work in far area from suburban of provincial city and less signal were prominent at site. Other problem found with smart phone internet access was downtime for repairment and upgrade was visible no more than 2 times that last longer than 30 minutes within six months for all carriers interviewed. From all subjects, about 88.96% have internet cables in their residents, which accounts for 1128 individuals at home, apartment, and condominiums.

This can summarize that language vision were main barrier in using digital technology, while physiques fragileness was less prominent in subjects presented in the study. These 3 factors were influential barrier in completing input in web system that can connect to available personal computer, laptop, tablets, and smart phones.

**Please explain in what ways the web-based system can make your life and adherence more convenient.**

Metropolitan and its suburban is convenient when they were carrying it around and never forget where to take with. Smart phones go with them when they go to places, eat, and sleep, whether at home, on vacation, or work. From interviewing 1268 individuals, there was a few in 38 people whom finished doctoral degree that talk on more convenient, if it can be more interactive similar to A.I. system that can have reminder from android program. It can remind the usual time taking, can schedule like clock and postpone if would like to take a later time or change whole dosage interval.

*While the web system was already very good at recording and calendar checks, it would be more convenient if android system can make reminder from android base smart system. This would be more useful instead of e-mail reminder for the day that has pop-ups in the smartphone console setting that daily reminds for input of web system for bacopa extract. The android application would be more automatic for data exchange between smart phone or laptop and web system. So,*

*whenever the internet access wasn't be able to reach, the access can be made later automatically by the android application's default in reaching the web system.*

This was very good way of opinions from the interview, when reviewed by educated people. For other people, the answer was the same that android application can be made and they can put information without having to access the web and information privacy was also one of the factors that individuals were aware of during the study. However, they were reminding that all of information were kept secret and no one could access their information since it was encrypted using latest SSL encryption technology and storage doesn't have information regarding subjects. The web system had extra security for each page when scan and input the information.

Many people also mention that the web system not only make their life convenient when it reminds them to take bacopa by routine behavior and self-care responsibility behavior. It also makes their phone more valuable and more awareness were coming from more knowledge learn from pharmacist and web system importance. Within this, all have agreed that it makes them felt more lightweight in responsibility when they can forget things when they are in a hurry, when it is not the phone that they forget. These were all the convenient they receive from the web system and future convenient of talking to physicians about their nutrition and self-care was another perspective that the future may have the opportunity in real life.

In summary, there were no opinions that can be made to current system as it has reached the point where it was convenient enough for the ability of web system that can't go beyond its programmable point. The more convenient opinions from educated consumer were in areas where android applications can memorize input and send to server system later. Hence, completes a software development cycle for a system that current challenges solve tomorrow's problems.

**Do you feel that web-based system interface is effective in handling your adherence in every day routine?**

The web-based system interface when went by functions in effectiveness, it was agreed in 1,268 people that it was effective enough in calendar checking, scheduling remind through e-mail, web referral to government online retail store, and

input review tablets taken for the past few days, to a week, month, and year. Also, in the study there were no color-blinded people in the contrast shades used in the web system and special color-blinded where shades of grey color may fully or partially compromised vision.

In the study, 1268 people within the study have answered that the interface was easy to use and beginner-level friendly. It is effective in storing data and recall data when you want to check usage data for time interval involved in bacopa extract consumption. It is very easy that you can teach your family how to use it, when they may be a help in the future within 10 years if their body functions deteriorate within the next 10 years. This was account for 62 people from 201 people ranging from age 60 to 80. While 60 years old becoming 70 years old, with neuro-deteriorating chronic disease such as hypertension and diabetes. There is a chance that if any happens to the current user within 10 years approximately, their family member can help with web system input. This comprises of all people whom were able to input the number of tablets per day and people who had barriers mentioned, having family members input the calendar for them. This was for the beneficial of the consumer when physicians may ask about their daily supplementation and may be if lucky enough for medical research, their information would be very significant evidence for new drug or drug structure that can pave way for many neurological drugs in the future.

Also, the same group of highly educated people, also have another ideation that current web technology already suffices the everyday companion of use, however it would be better in the future if the web system can be more advance to accept incoming speech and process system. Another way was to make an android or iOS application for speech recognition and process to accommodate people whom lives alone and doesn't have friends or family near.

*The system used was very good in everyday manner, however in the future for some people they might need extra help when they live alone, where A.I. and voice recognition may be made to accommodate user of bacopa extract when they need and at the time they need most, in about 10-20 years' time. During that time, physiques and mental stamina would be decrease as speech may be already be slurry,*

*movements may be shaky, and the interface might need to be bigger for solving shaky hands in some geriatrics.*

This can summarize that the interface was already effective in everyday routine, although some of opinions during interview were express from non-self-experience, most were friends and acquaintance that volunteers knew about and same type of people in the future may be in need when they want to take bacopa extract in the future, when pharmacist evaluated their physique and advise for use.

**How do you feel if web-based system would evolve into digital patronage in the future that lets you handle adherence better?**

Many people feel energetic when web-based system can be made into digital patronage that online interactions were in the tele-pharmacy actionable areas. Although some customer has interacted through telecommunication smart phone apps were not surprisingly eager, as they already have some form of communication method already. Metropolitan and its suburban felt very surprising if web system would turn into digital patronage because it meant that it would become more of a system that does more than the current system that harbors telemedicine and tele pharmacy into the system. It would serve as a very good point for them to connect with retail pharmacist and physician in the future, and also order supplements directly from the online retailer.

*I would feel very happy about the transition of web system into digital patronage that has all functions need for consumers, this would serve as a place that makes ideation of digital city comes true in the future. The Bangkok metropolitan is a place where many digitization of services has occurred to accommodate conveniences for people ever since before pandemic strike. It would be very good if the digitization will occur again as digital patronage in online retail setting.*

This was one of the people whom lived in the city and were educated in a very prestige university, many trends were realized within this subject mentioned. Similarly, the people in the educated group working and living in the metropolis have the same thoughts that digital patronage would be a place that they want to visit every day.



Provincial and suburban were also interested in the ideation however, some have limits about their internet connection that it doesn't support internet speed and current high-speed technology would take about 5.9% - 8% of their income for high-speed internet SIM. Also, there were concerns where the high internet speed may be used all before, they can communicate with the pharmacist and physician, hence the connection speed may be about 384 kbps when they talk to the healthcare practitioner. This also brings problems to healthcare system. When seeing consumer's directly, more information can be made for the practitioner and some symptoms can be detected if seeing directly from telemedicine and tele pharmacy camera. Although, even if the slower speed were accounted, quality of communication would not be worsened, as consumer can take pictures of themselves and describes their conditions slowly through chats or messenger system that were normal in many web systems that were built with php programming, such as Facebook.

*I have never seen the healthcare sector of the government doing this type of thing for the whole system. It would be better if it can be done within the next few years. I think that there's a need for digital patronage so Thailand can become a better place that were similar to pharmacist and doctors visit patients at home, a service that were offered 10 years ago when introduction of doctor of pharmacy we're seen as a commotion in government's service to the poor. If the digital patronage can be done, it can help a lot of people and manage clinical signs and symptoms effectively with time management. The healthcare team can review cases from digital teleconference with patients at home that uses medicines and supplements and then visit them later with things to be discussed.*

This opinion was seen from an educated individual that had been retired for 8 years and have been visited by several physicians and pharmacist at home for their family members. This has shown that countryside people were not all uneducated people and far behind trends, the globalization of information technology from the past 20 years have shown that information gets to people quickly and current situation worldwide requires memory and learning to be very important in human life.

For many people in the countryside, they also would like to have a centralized system that all people can connect to when they need help for their conditions. Many



people living in the countryside were unable to visit medical center often, an application that enable them to talk to their physician would be a very good help to them. Although, they weren't familiar with the terminology digital city and digital patronage but anything that they can use to talk to healthcare practitioner would be very helpful because they have to travel a long way to get to capitol city of each province. Also, the digital patronage would make everything easier for them when contacting the government centers, especially government hospital. Currently, many government centers have digitization of their services and digital reserve queuing in places such as driver licensure place have partly been digitized in driver's license education and driving examination queuing reservation. Although, many people have not seen the much digitization with healthcare sector, the web system in this study was an introduction that they may be able to use a government healthcare system that were in a pace to digitization of better services, thus reaching digital patronage of online pharmacy retail system from the government.

In analyzing all of the subjects involved, the globalization of information technology has delivered many information to Thai population as a whole. Digitization of services for product has been mainstay for many businesses in operation during the pandemic and help keep economy survive through the instability through purchasing goods and supply chain resilienceness. All subjects within the study have known how to access internet for acquiring information, news, and socializing through different type of networks from twitter or X, Facebook, News sites, and YouTube. All of these were preliminaries that shows many Thai people in wide range of age can use a lot of new digital technologies without much require of education. From the usage at starting point, all were able to use the interface and system efficiently and easily. It was easy to read, check, and navigate. Also, in a sense where interviewer didn't ask much deep into digital technology, many were able to give information on what they need for the use with smart phones. This can be summarized that people in the central part and its vicinity, southern, and northeastern part of Thailand were people whom can use the digital technology with ease, with the age range lower than 80 years old as an efficient point where their visibility and language barrier may need additional help from family members.

## PHARMACY RETAIL INTERVIEWS

Store in metropolitan, metropolitan suburb, provincial, provincial suburb, and countryside were interviewed with questions and some items were discussed.

### **Please explain about your store management prior synchronization, how well did it perform in terms of efficiencies and operations.**

On a daily job, the government pharmaceutical store remains the same in efficiencies and operations on their functions. However, the busy hours were different in some location due to the size of people in the demographic region and commotion in-between the hours, such as people going home and pass by the retail location. Certain jobs done during the day, doesn't involve much time. There were enough people to take care of all functions from warehouse stocking checking to secure supply chain, in-store random checks of item available and missing before thoroughly checks every 6 months. A routine expiration checks on all retail doesn't vary much since all were computerized.

Although the study didn't emphasize directly on to government retail store as its solo competitive performance, the research emphasizes in all retail across the country with its efficiencies and performance in mind for synchronization with manufacturer for supply chain and consumer behavior with web system usage.

All stores in metropolitan and its suburbs and provincials exhibit the same work flow through usage of computer. However, in provincial suburbs and countryside, there were some computer retail stores that requires much manual input and checking due to its small size and a smaller number of drugs available. Most drugs countered were the ones that their acquainted customers were continuous users. When ask of all retail stores, most of their jobs were accomplished within 12 hours of work, when there were two or more clerks in the store. This is mostly seen in small retail stores where their stock items were less than 500 brands. With variation of at least 2 brands in some pharmaceuticals for small retail. For larger retail that

accommodates larger demographic area such as the ones in provincials and metropolis have variations from 700 – 1000 brands or more. However, with some smaller retail may have around 500 – 700 items. For stock checking interview, there were no variations in small size to medium size store that stocks from 500 – 700 brands of doing stock check that can be done within 16 hours' time. For larger retailer, it was done with total hours no more than 24 hours' time. It can be summarized in a table below.

From interview, there weren't much difference in variations in timing of consultation in pharmacist during their work days. For government retail store, it was seen from managers that most people already have their medical and pharmaceutical consultation from the hospital they visit and rarely were seen in pharmacist consultation. The same was seen in retail pharmacist in suburban, provincial, provincial suburban, and countryside that consultation was not seen much. Most consultation were on reminder of certain pharmaceuticals received from hospital and side effect problems or drug interactions with other medicines receive from retail store. Although, most cases weren't seen much in drug interactions, so the time spent on consultation was short also. From experienced pharmacist, a time of less than 10 minutes was usual time.

Base on average small retail has customer visit less than 50 visits per day and about 70 – 100 visits per day in suburban and provincial area. In metropolitan area after pandemic recovery was able to return to more than 80 visits per day to more than 100 per day in large demographic area. In small retail of 50 visits per day, average time spent on each customer was 4 minutes. This was around a 3 hours and 20 minutes per day, leaving time for retail store work about 4 hours and 40 minutes. With time variations on pharmacist giving consultation for pharmaceutical care, usually there weren't many and were occasionally. This was plenty of time, as saying that retail accept the research synchronization work was also ask if it would disturb their daily functions. All stores were kindly accepted the research work.

In interviews among the retail stores, these were the findings:

In terms of daily work, in a government retail store, they have more workers than small retail stores, so constant refill and job functions were distributed to get all things done for the day and amount of work were equally divide among workers.

*“In our store settings, most work were divided among the workers to get the jobs done faster so there will be more people available to talk to consumer when they walk into the store. This was important because some consumer need attention to feel care and that their needs were satisfied through communications to get what they want. In terms of store operations, all personnel were train to do jobs so they can pick up any jobs if one personnel were sick, have outside duties to complete, short term absence for pregnancy & newborn care, and absence for vacation. This was seen in store operation to meet disruptions and continue operations for all job functions. It can be seen after around less than 6 months of work, all personnel were acquainted to most of the functions required for running retail store, that were non-managerial functions. Also, when general managers have days absence from work, usually an assistant manager will take care of the jobs for them to come back and pick up where it is complete by the assistant manager.*

*In a day work, usually all of the jobs were complete less than 35% time of working hours were seen as satisfactory for the re-shelfing, for distributor sales usually another store clerk would get items from warehouse. The store operation has very efficient operation that brings performance in jobs done. The retail operation was effective to prevent disruption because everyone knew each other's function and were constantly check of their understanding, it was done constantly so no one forgets. This was one of the main strengths that retail operations have, it might be similar to other retailers that portray strong operations that may be seen in cluster retail and franchise. Sale performance of store may come from the efficiencies in personnel scheduling to work, on days that many customers came in for products that were a big market hit, a best sale clerk may be presented to give better communication and secure long-term sales for that particular product. This also happens with products with new promotions that requires trained sales and clerk to help with promotion sales.”*

In retail stores that were in provincial areas, it was seen similar to government retail operations that their efficiencies in operations relied on managers to train their knowledge in retail operations to 2-4 clerks in rotation to be able to pick up each other's work and continue operations when there was absence from sickness or leaving company for another job. This prevents disruptions in retail operations where time to complete would not be lengthen. Although, there were some retails that have their own accountants that pick-up jobs from each point-of-sale computer station and did accounting and report at it headquarter, so retail managers would not have much work to complete. It was mentioned that they can function more in consumer relationship and focus on achieving retail brand's consumer trust.

In terms of promotions, they usually have product representatives from production companies to help retail store as additional assistance during some day in a week. This were type of action that helps product from supplement companies to stay in competition with other competitive products of the same indication. All can be seen from interview below.

In a retail from provincial, this was interviewed:

*"In our retail operation for efficiencies, it was different from other small retail as we are in clusters that have same owner, the sales in each retail store were route to headquarters accountants so they can work smoothly on the sales, taxes, and payroll of each personnel. This way each personnel can focus on their jobs effectively. Personnel can focus more on their communication performance to increase sales each visit, memorizing what each customer uses and be able to compare old products with new products when there were needs to increase sales to make better profits each month or quarterly. This way it can be seen that at the end of the day, report sales can be summarize at night and morning meeting with headquarter chief executives may be able to review numbers daily."*

In metropolitan suburbs were similar to provincial suburbs in store operations, although some were similar to provincial cluster retails and franchise when some functions in retail operations were left to specialize person such as accountants. For metropolitan suburbs and provincial suburbs and countryside, when retail manager is



the owner or a hired pharmacist whom was the retail operation manager for the store, it was seen that all job functions were done with few people. Although, in these few people their store operations were up to 1-2 people in charge for the retail store operations, the earnings also depend on them during store opening hours. Usually, there were 2-3 people store in each day and most operations were complete using 2 people only, while the 3<sup>rd</sup> person may help in assistance role. This were seen mostly in family pharmacy setting where it has been operating for many generations and also in a retail store where government hospital pharmacist had opened their own store after work. Each store had around 1-2 people as pharmacy clerk. Store efficiencies in operation was in satisfactory for every retail manager interviewed, as the store size and stock in merchandise wasn't much. It was around 500 for small retail and 700 for midsize retail. It doesn't require much work as FIFO or first in first out in retail stocking and product flow was not much within 1 week. Although in a product that exhibit sale performance there were seen in increase due to pandemic outbreak, certain types of allergies in population, and chronic disease drugs.

It can be seen in an interview below for retail operations:

In family-owned pharmacy it can be seen as following *“My pharmacy opened as a family pharmacy, the workers we hired was seen as efficient in their jobs given and communication with consumer. Although, KPI weren't implement in the store, as daily functions were ordered as help to complete each store operation functions. Sale performance was mostly seen when same customer came back to them for purchase. It can be said that our sale depended on customer loyalty and service.”*

In non-family owned but hired pharmacist as manager, it can be seen as following *“Daily job functions were complete by a pharmacist whom were taken the job as manager. In terms of efficiencies, the owner required that operations and difficulties were report to them weekly. Stocking, re-stocking, and shelving when done neatly without supply chain problems were seen as efficient in store operation. Sale performance was seen from popular products that they use often, products that they can't find in other stores and also products that they were acquainted customer of this store.”*



In both retails, it can be summarized that their store size were about 500 merchandises in warehousing and shelving. So, the effectiveness was evaluated by daily functions that all were complete in time within opening hours. Also, sale performance comes from right prediction of what product may be good sale in a demographic region and consumer education from clerk. In retail store within metropolis suburbs, provincial suburbs and countryside can be conclude that managing was not strict to making reports and keeping KPI, reflecting that customer visits per day isn't much when compare to stores that have more customer visits, especially in province and metropolis.

**Does your current operation well performed in profiting and gaining profit margin in food supplement market sector in untapped areas?**

In current time, the store operation was continued to performing well in profit for some products. Because of the economy, continuous purchase of regular product was seen in the returning customer whom has continuing money either from government's retirement money, stock investments, insurance investments, and their own businesses that has continuous profits.

In five demographic regions of retail pharmacy studied, the gaining profits in food supplements were seen in a steady rate in customer whom has continuous chronic conditions. There were largely cheap pharmaceuticals for all people in society with lesser income, so it wasn't seen that consumer were less due to economic disruption. The pricing of vitamins and minerals weren't high for the lesser income people, or no income that family members were able to purchase items they need for them. It was seen that operations were well perform to adapt in economic changes throughout the years in business. The gaining of food supplement seems to be higher than previous year for all retailer studied, this may come from stress and chronic conditions that were seen to increase in population. Chronic disease tends to cause

conditions that may require pharmaceutical intervention and supplementary products were available to help conditions to lessen or prevent in severity. It doesn't treat illnesses but it helps in lessening some conditions involved in disease, such as diabetes had medical dairy products for helping prevent muscle wasting and control blood sugar level at moderate level. Supply chain in these nutraceuticals and supplement were continuously replenish at good rate, so it fits number of growing geriatrics people in need and current customer using in long term. It was seen in all store that they were doing very well in stock food supplement than pharmaceuticals, since political involvement of government policies for the poor had effect on all retail stores that people can get medical treatment and drugs for their condition at the hospital for low price services through government Medicare policy. So, the stocking of pharmaceuticals was less likely to be stock much, mostly in provincial suburbs and countryside. Also, most drugs in warehouse stock reviews were inexpensive drugs for people. Non-generic originators of research pharmaceuticals were seen mostly in provincial city, suburban of metropolis, and metropolis. Provincial suburban and countryside were seen stocking partially of non-generic originator drugs that had important clinical trials research. Mostly, these types of drugs can be purchase by government workers and people whom has medium to high income, when they bought these medicines from retailer because their next hospital visit was lengthen. From these explanations it can be summarize that the ability to gain profit from untapped area can be gain in the future when drug price is decrease or change to generic form and there is more available money for supplement that may be taken with generic drugs in the future. The store clerks were also reminding of this and able to gain future profits from this untapped area in increase pocket money from changed regimen. The retail store operations were seen as efficient in giving education and consult on certain supplement that were suit for consumer's pocket money in the current time and in the future, when their pharmaceuticals were changed to economical one and they can afford the supplements that they asked at the current time. All store interviewed and participate in the study were in business for more than 4 years in each region, so this can conclude in data that can be trust for future research on socioeconomic and business studies in Thailand. Since, currently there were few on pharmacy retail store operations and supply chain management.

It can be summarized from retailers below through individual interview:

In metropolis government retail store gave interview information; *“our store operation was currently profiting from food supplement product in terms of customer satisfaction and product efficacy that were competitive in quality. Profit seems to increase each year in regards to efficient production from the manufacturer. Many small retailer and distributors seem to be profiting as well, it can be seen through rising numbers in batch manufactured each month, when compared to last year in bacopa products. In other products of supplementary category also received good market share. In terms of untapped market by indication, it has been a few and steady number of self-refer people and medical news advised people that they should use the products for another indications. There may be some people whom use a Ceylon cinnamon type that were use for antifatulence, used for another indication such as uncontrollable blood sugar. However, more study may be need to confirm findings and effectiveness. In the current time, there has been studies and research for andrographolides extract and for the untapped market areas would be the antiviral properties in cold and COVID-19. Traditionally, andrographolides were used for sore throat and fever.”*

For non-government retail store in metropolis also seen that their profits performance in many supplements in market that were current popular brand or popular use by certain people whom knew the product for a long time. It was found that for untapped market, comes from the knowledge of pharmacist and clerk alone when they knew what to do more with a supplement product. certain types of customers were that were self-refer were customers whom knew its uses through medical news, self-taught, or knowledge that were from many generations in families. For example, Chinese people knew about traditional Chinese herbs from their families and Thai people knew about Thai traditional medicine from their families. It was knowledge from generations to generations that also help in profit generates in untapped market areas. As it can be seen from retail pharmacy owner below:

*“Some customers that came to store, they purchase supplement for varieties of reason, some use Cinnamon for prediabetic blood sugar and some uses for antifatulence. Curcumin extract capsules were also used for intestinal detox rather*

*than antifatulence in some users. Andrographolides traditionally used for sore throat and fever were now use for antiviral properties against COVID-19, which may be useful against but not treatment of COVID-19. Many supplement products when extract was now beginning to see the use in untapped market and increase in profit in stores were seen continuously from the consumer's long-time knowledge and knowledge in pharmacist education."*

Managers in retail store in elsewhere other than metropolis suburban seems to digress with the increase of profit coming from increase use due to improvement of conditions whether through direct indication or indirect indication in the untapped market area. At the current time, the current retail operation didn't increase much in sales and was steady for most pharmacies in metropolis suburban, Provincial, Provincial suburban, and Countryside. All were agreed that some products were able to sell faster and have sales performance and some was seen once every 4 days and once a week. Some were seen as once a month and once per two months. This may directly come from the tablets contained within a bottle taken per day or twice per day. Sale performance was seen increased in products that have promotions on continuous used product. It may come from visibility of product effectiveness.

One of the managers in interview group mentioned: *"The effectiveness may cause increase in sale performance alone when more people were attracted to use and use in long term because of its effectiveness. The popular brand was known for qualities may cause shifting cost sometime when availability of some product did not reach store in time. However, when customer they see the brand that the normally use, the product on shelf was able to retain its customer again."*

Another manager from a provincial suburban also said in the interview that: *"Store operations in terms of consulting and education also contributes to item success in retail store, when customer understands, they tend to buy the same thing for long time because every item was the same in quality and effectiveness. New grounds of market competition would be in the personalized supplement that may have more customer and sale performance would be different but store operations would similar that of Chinese traditional medicine where you pick up the Chinese herbal blend in Chinese traditional medicine clinics. However, marketing*

*segmentation of available products in store have not reach that ideation yet, right now it had been developed within medical sector as personalized medicine. If products were to reach retail pharmacies, it may be come from blends that treats groups of people that has similar size, age, conditions, genetic traits, lifestyles, severity, and how their body functions. However, more research would need to be done for total population in order to verify that personalized supplement may save cost in materials spent in making, technologies involved, and beneficial factors for state and government that has people with better correct amount use of supplements. Similar to vitamin dosage, where all weren't use by the body and excrete as waste."*

From interviews, this could summarize that current operations in all retails have increase in sale volumes and increase performance were seen in products that were continuously used. All of this comes from its effectiveness alone and consultation also effects its long-term use that give rise to sale performance. The profit in sale performance also has some contributions from indications outside of use but were seen in medical news educated people, self-refer, family knowledge and pharmacist consultation. All of these came from successful store operations that have sustain their business more than 4 years for all retailer participants.

**Were your store clerks able to complete all tasks given correctly by managers?  
Please state if problem arise and persist from current management.**

Within the research there were no problems in current management in small retailer, distributors, and government retailers. The management was professional through self-discipline and use of computerize system to manage store operations. The software used was efficient in re-stocking in warehouse. The store operations have strategies where effective communication were used to inform and test understanding in verbal and actionable results. With experienced workers, there seems to be no problem in management but new employee may have taken some time to learn and profess the retail operations. There were no problems on task completion as store operations were actually easy to follow in large retail setting, distributor, and



small retailer. The store operation has similar actions but some store operations might be different from each other in management, depending on owner's visioned goals. In larger retail store, it was seen that same actionable items in retail paper work of stock management may be more than in larger retailer, although it was solved by having worker take care of different items separately, or entirely managed by headquarter personnel whom work on entire franchise stores within separate country parts. In midsize and smaller retailer, it may be done through the retail manager alone or by pharmacist who is owner. In family pharmacies, the retail operations may be done by the owner or pharmacist and clerks. It is to be acknowledge that retail pharmacies were usually operate by Chinese people and have long retail operating for more than 10 years in the area. These were experienced people and have continuous customer, most functions were done by the owner alone because it was family business. So, when ask about problems in management the problems in management, there seems to be no problem at all, except when their worker doesn't come on someday, they have to do the work themselves. It was found among provincial suburban and countryside that some family pharmacies still use accountant book for managing retail sale when their earnings wasn't much during the day, then input into computer later for checking stocks. The software use was also from Chinese operated business firms. So, within the study it can be conclude that in retail operation the most difficulty is employee's absence during work days and employees leaving for new jobs. Some retail store that doesn't have full-time worker but hired part-time worker also have problems on employee absence during workdays and all of the work were to be complete by the manager and owner. Although, it doesn't matter much in many retails as their visits per day doesn't affect quality of retail operations. This can conclude that business operations have problems with employees not showing on workdays and employees leaving retail pharmacy jobs. Although, with these problems happening was solve by modern software in retail operation that can manage reports faster than usual.

The difficulties with employees leaving were seen in small retail stores and franchise stores when competitions were high. Government retail stores also doesn't have employee leaving retail stores, unless they were hired for a length of time. Most



government officials were hired until they retired. Also, in a family pharmacy setting was seen that there were less employees leaving but although not showing up on work days were seen, as retail management in some stores were not strict in management. It was seen that part-time worker they come to help or may not be able to help. In a retail store that were pharmacist operate, usually they have at least 1 assistant for help with store operations, were seen with less employees leaving. A further discussion on details, had an answer that usually their store clerks were their friends and families or friends and families find it for them. This happens in provincial suburban and countryside, this is because it is not a big business from owner in other provincial trying to open a business franchise somewhere. Also, friends of families or friends of relatives of family were more trustful than other people when it comes to business security and money.

Usual retail operations were finished in time but re-stocking may be slowed by transportation and logistics in retail stores in faraway provinces. Thailand has drug manufacturing site mostly situated in Bangkok and suburban provinces. This can conclude that time to restock was also one of the minor problems in store operations. It was seen through interview that sometimes sales contact visit at the same day and delayed store operations was seen from taking care of orders in small retail. Logistics of arriving on the same day and next day was also seen as problem when all arrive on the same day when stocks have to be check. This happens from many sales visit from companies and have products reach retails quickly, causing bottlenecks in retail stocking in warehouses. These were seen at times in some retailer but not all retailer, later were resolved by scheduled appointment.

**Were your store clerks able to make customer adhere to product use continually?  
Please state if there were problems arise and persist from current management.**

In metropolis, government retail sale has no problems in explanation of many products' usage, although deeper discussion relating supplement use with drugs were directed to pharmacist only. This was also seen in non-government retail store in

metropolis. For adherence, certain product knowledge education was taught by managers and product representatives from certain pharmaceutical and food supplement companies that produce their products sold in retail stores. Most assistance were able to educate consumers on adherence afterwards and consumers came back to retail store for re-purchase. There were some problems seen in trainees in comparison of products when customer ask the difference. This happens during busy hours, although when trainees don't know the difference when all knowledge wasn't all taught during first few months, usually a pharmacist would pick up customer to consult further. This was seen in small retailer and small franchises. Problems in retail management that were in stocking and re-stocking doesn't have problem seen in all stores within the regions in the study. All retail management for stocking in conventional management involved only simple math that doesn't require higher mathematical statistics for small retailer and small franchise. However, at a corporate level more sophisticated statistics for predictions were more involved with regional microeconomics and country's macroeconomics that involved large scale calculations and predictions.

Problems with new trainees usually doesn't persist for more than 3 months at an average, and proficiency in communication and education of supplement benefits to consumer starts after around less than 6 months. The number of less than 6 months were agreed among the retail pharmacist and owner whom trained the new trainees. There were some retail pharmacies that also have slow learner and speaker that were also hired. Although there wasn't much in memorization of each food supplements and many supplements information was available in Thai language, it has no problems in learning through self-study and memorization with new trainees. Some retail store that has imported supplement, usually pharmacist were people whom educated the use and benefits to assistants. When ask about problems arising, many retails answered that pharmacist and owner constantly checks worker's memorization of things when it comes to taught education in supplement and drug usage.

In terms of training employees for supplement adherence, there were no problems seen in in pharmacist assistance, as many supplements were easy to remember. Also, it was seen with many pharmacies that severity of chronic disease

also helps remembering better, such as andrographolides were use as supplementary to modern pharmaceuticals in using against COVID-19 and use extract only for a week. Many times, retail pharmacist also brings conversation that ask about benefits and usage of certain supplements to improve memory and recall of assistants. These were preventive measures in service failures, improve workers relationship, and improves confidence in dispensing supplements to consumers. Sometimes, when pharmacist trained assistant themselves, they also knew that which assistant can answer the question. Same thing with assistants, when customer enter the store and ask for a supplement for his ailment's indication, a pharmacist would call an assistant to help the consumer in picking the supplement they want for the indication they need. It was seen as reinforcement in what they learn with increased confidence in dispensing, for the pharmacist assistants. As seen below from one of the retail stores that were in suburban of Bangkok.

*“Trainees were trained and educated from pharmacist or product representatives from its direct manufacturer. Many questions were asked during the day for product usage and indication recall and its benefits. If they can't remember, the pharmacist was asked to tell directly, so they don't feel stressed at work. It also helps pharmacist to remember from continuous reminder. This improves worker's relationship and strengthen retail operation. It also helps prevents employees leaving also, when they don't feel fit-in the organization. The education of benefits, indications, and usage of supplements wasn't hard, it needs time to profess the communication skills.”*

Another retail owner and a pharmacist added:

*“For experienced pharmacist assistant there weren't any difference in helping consumer to adhere for supplements, if chronic diseases were presented, usually the customer would refer to a pharmacist nearby. This way would prevent service failures when certain supplement may not be suitable for use with some medicines and some pre-existing conditions. Service recovery from dispensing irresponsibly is detrimental to owners and pharmacy store reputation.*

*In case of new trainees, they would be watched with experienced pharmacist assistants until they gained confidence in consumer education and be able to make consumer adhere to supplement use. This process makes new trainees able to make consumer adhere to supplement usage in short term and long term, depending on supplement indications of use.”*

Some retail and small franchise also have problems on workers leaving for new jobs, this may be found at the first 4 months of training when they found that they don't fit in with. Sometimes it causes small franchise and retailer to spend more money on hiring two personnel at the same time to prevent employees leaving. When employees leave, they have to hire and train again, this was problem for many franchises when it comes to business operations and business security. However, in countryside in provincial suburban, countryside, distributors, and government retailer don't have this kind of problem as their employees usually were acquaintance or hired government workers whom have good retirement plan. It is to be acknowledge that with retailer that has worker working continuously for years, usually they were acquaintance of each other and some were diligently and highly self-disciplined.

**Can your current management handle supply chain management effectively?  
Please provide information on how much work was involved.**

From interviewing all retail stores involved, all were using computerized system for the retail store management. The supply chain management were handled through the software. Some small retail uses inexpensive software that has more sophisticated function in store management. Some retail clusters use newer version of software that has clinical management functions and more functions that conformed government standards in quality drugstore policy. Also, some pharmacies use enterprise software that manages each retail in franchise differently according to packages select from software distributors. Some of this pharmacist retail management software were subsidiary from hospital management software.

For stores that has quality drugstore status, all used the retail management software that has clinical functions to accommodate patient history taking and

pharmacovigilance work. For drug stores that didn't have quality drugstore status, all were using non clinical enhanced pharmacy retail management software. With larger franchise and small retail clusters, some uses enterprise management software and some uses simple retail management software. It was found that there wasn't any difference in the ability to manage supply chain for all merchandise in retail warehouse or central warehouse that act as distribution center for all small retail clusters or franchised retailer.

The current management was very effective with owner's experience and pharmacist experience in handling supply chain. Computers were use to acquire information on product expiration and how many in stocks that needs to re-order, from that point a simple calculation of re-order would be made for order fulfillment with headquarter or pharmaceutical companies that produced the supplement. With some retail software management function was able to memorize re-order point when set remember. With Bacopa Selext supply chain, all retail stores answered that they don't have problems with government logistics and third-party logistics.

Organization operation in management of logistics was differ throughout, as some franchise may order supply to headquarter first then distribute to franchise involved in each region. This may have some delayed time in supply chain re-stocking at each retail franchise's warehouse. For small retailer, operation of supply chain re-stocking were similar to government and distributor where they order directly from manufacturer's sales and logistics delivered to their warehouse directly.

With current management, all retail store types were efficiently managed using computer and personnel to acquire new stocks to replenish their retail warehouses.

**Do you feel that information at hand was enough for the operation of your store management? Please state if you have any thoughts on what can be done to improve your management.**

From interviewed, many managers feel that their store operations were effective since they don't have problems from computer usage and retail management.

It might be from the fact that they were experienced user of software and managing retail store were many years with the current year in counting. In regards to information at hand for management, the brochures and product information were enough to educate consumer and customer that walk into retail store. Also, the use of computer for extra information were also ease of use.

It was easy in acquiring information on medical news that can keep up with customer in current medical information. Also, pharmacists in stores were able to retrieve information of pharmaceuticals through the use of android applications and iOS applications that have applications that can access medical data website and medical news information. These were seen in much confidence for retail stores that acquired quality drugstore status from the government. It was seen as excelled retail pharmacy store in education and service also.

There seems to be no thoughts on the operation of retail management on the supply chain part because it was done using computerize software that eases retail operation work on getting products into warehouse and count numbers in warehouse to remind manager to restock items in warehouse. It also acknowledges expiration date on the system. However, for information regarding product education, new product in competition, and medical news sometimes it would be easier if sales from manufacture would provide more information on product training such as DVDs or video information that can be studied with brochures. This would give more confidence in pharmacist assistants whom also dispenses the product for consumer. This advice was from managers from provincial suburban in northeastern part of Thailand that worried about their assistance. However, some supplement information was available on YouTube but not all information were presented for the safety and practices.

*“The quality of service was depending on depths of knowledge in each product in consumer healthcare also. This give rises to whom finding information would be more attentive to give better advice that can improve adherence in consumers. Some manufacturers may tell the good sides but leaving safety precautions to healthcare workers to find out also. These were precaution measures made to give consumer best quality in retail service. So, it was need to have more*



*information for each item before any risk in medical news came out to warn consumers.”*

**How long have you been running your business, does your management runs into problems with customer? Please provide details.**

In summary, all retail stores were in operation for at least 4 years. During busy hours it was found that many customers leave when too many people were in for retail purchase and wait for service care. Some customer purchase wrong items and came back for exchange or refund was also other problems that was seen normally every month. Although policies of stores may be different, as some franchises don't normally accept return unless products were damaged from manufacturer or logistics. However, in smaller retail there were policies that accept unopened goods.

Customer satisfaction were keys to customer loyalty, it was seen that government retailer also accept returns if reasonable explanation were given. This was also seen in franchise and cluster retail stores that relies on customer satisfaction to gain customer loyalty and see it as service recovery in a way that help their stores gain reputation in customer's trust that their business operations were to help customer first and making profit from non-returnable goods was seen as unacceptable. This can be summarized by one of the retail managers:

*“Refund goods or exchanged goods was one of our policies that keeps customer happy, the retail reputation doesn't need angry customer, however there were steps to refunding that goods must not be damaged and unopened. The reason was that with certain manufacturer, when bought at a non-returnable price, the products would be more inexpensive. For returnable expired products, the wholesale price would be higher and retailer won't be able to give promotions to consumers. These were the downsides of wholesale purchases from manufacturer and distributors.”*

**Have you ever run into problems arising from product re-stocking and warehousing? Please provide information on how you solve the problem.**

Product re-stocking, there were problems arise from products when logistic arrive at the same time for retail warehouse, this were problem for all retailer because products within the box also had to be check before keeping in warehouse. Small retailer would have problem when taking care of customer also, when another one was to check the number of products inside the box. Logistic also operate during day time, so there's a problem when logistic came through at busy times. This type of problem was normally seen in many logistic research.

Common problems found in all stores in faraway provinces were *“goods sometime have defects and unreturnable. Sometimes it comes from flood that moisture affects goods packaging. Also, with truck accidents on the street some products had packaging damaged. Usually, these packages were late within a day or two. Sometimes, it was delayed because there were numerous points to route the package from province to province, logistics doesn't do long distance travel because they fear that disruptions may happen from drivers sleeping. So, when re-stocking sometimes they have to wait many days until the package arrive and sometimes it wasn't predictable, so sometimes it had to be calculated with warehouse stocking forecast for the days that goods will be purchase during the delay in logistics in faraway provinces.*

*However, with modernization of transport trucks, a more sophisticated air-conditioned and better sealing were begun to be noticeable in many logistics, but sometimes there were also damages on the packaging box that can affect customer satisfaction at minimal level. The businesses in logistics have to compete and meet medical logistic standards.”*

Another problem that was found in all stores was that *“logistics arrived at a same day or next day that causes less efficiencies in store operations on servicing customer. This causes several things; one is that it takes time off from other jobs to do in a day and staff needs to hurry with all the received goods checking. Second, it disrupts quality of service when workers have to do more jobs at the same time. While*

*checking received orders, when customers came in sometimes, they may forget some important points. This happens sometimes, and an awareness of service mind also had to be reminded to workers. Third, another worker from another franchise may be need to travel to another franchise to help with checking the received goods and input the amount into retail software system.*” This was mentioned by a franchise manager, who also saw from experience that former retail had this type of problems in some months and other retailer manager were also ask of the same question and found that they also have these problems also, once in a while. Which happened when sales usually came to visit stores at the first few days of the month and few days after the 15<sup>th</sup> of every month. This was later solved by scheduling was seen in all retail stores and schedule timing of logistic were also seen. However, when it can’t be solved through logistic scheduling, an extra part-time help would be hired for one day or two in stores that were midsize or small size but have high performance sale due to successful location for retail pharmacy business.

In terms of supply chain for bacopa and products from government pharmaceutical manufacturer, there were no problems in supply chain in shortages and acquiring goods were easier than other manufacturers.

In summarization, these problems were never ending problems with experienced managers they would know the behavior of manufacturer’s sales people and knows how to manage logistic operations that will not disrupt the quality of retail operation on customer care. In the latter part of this section, would show the importance of web system and synchronization in retail operations.

**Were your customer relationship management keep up with product adherence in some way. Please provide answer.**

It was found that retail quality pharmacy store and retailer that has enterprise management software, they have software system that can keep track of customer and what type of drugs and conditions they have. With this it was internal knowledge management system for quality worker that can learn from the system and knows how to take care of customer. This was seen in retail store that have more than 80 visits per day and continual profits were able to finance the monthly service of retail enterprise

software that can take care of customer relationship management. Although, a smart retail management software that were single-time purchase was also available for less than ten thousand baht and was commonly seen in quality retail pharmacy.

It can be summarized by one of the quality retail pharmacy store managers that; *“the training of the software system usage also goes along with supply chain management and retail warehouse stocking. The software system helps new trainee and experienced worker to input information on supplement and drugs that customer was using. This enables safety practice of pharmaceutical and supplement use, in single or combined for diseases and conditions. Although, the retail may have a membership card that can identify consumer or an input information such as name and last name for storing information for customer care. For products that need adherence would be note by the manager for workers to pick up information and perform customer care. Although, this system of care was quite slow and more than two computers were usually needed to be enough to take care of customer. It gives sense of being professional and readiness in service care.”*

Above mentioned, were seen in all quality retail pharmacy store as certain laws and regulations have progressed to push pharmacies to having qualities that consumer can depend on, in terms of retail operations and retail consumer service.

Although with experienced pharmacies that doesn't use enterprise retail management software system or clinical oriented retail management software, but rather using simple pharmacy retail software was also able to perform adherence also. These were seen in provincial suburbs and countryside pharmacy store.

One of the retail managers gave brief explanation that; *“In terms of customer relationship management, the pharmacist and assistant usually ask all of conditions, drugs, and supplements that they were taking and determine from conversation if consumer exhibit adherence or not. This comes from experience alone and managers also feel that their retail were exhibiting very good consumer care because quality conversation that can solve consumer needs was one of the key factors for their quality service. Customer also came back to the stores for the professional advice that they can trust.”*

**Were your store clerk and business operation being aware of cost-adherence, pricing satisfaction-adherence, knowledge-adherence, promotion-adherence, counseling adherence and benefits-adherence that can gain profit margin and earn customer expectation and loyalty? Please provide your experience.**

Metropolis and suburban, the operations in cost, knowledge, promotion, counseling, and benefits were in a training course for all workers including government and non-government workers. It was emphasized that customer satisfaction and loyalty come from the ability of pharmacist and assistants to pick the right product with economical price for them, meaning that low price with good quality and effectiveness for lower income people and high quality for higher price for high income people. This kind of customer service was seen in all retail stores because it was the right process to do in all pharmacies, more low-price dispensing was also emphasizing in faraway provinces where economy tends to be more self-sustainable rather than high volume purchase of consumable goods in many businesses manufactured areas. A manager at government retail mentioned with KPI scores that:

*“After training assistants and pharmacists for store operations, all of mentioned factors in the question can be summarize into counseling and choosing the right price for the right income type of customer. If the customer hadn't come to pharmacy with a sample of the drug or supplement that they want, pharmacist or assistant usually ask them if they have use which brand before to pick a right price of drug or supplement for them. The difference in pricing of brands varied not much from each other in terms of low price, moderate price, and high price. The effectiveness was usually the same for many brands that were taken into retail government store. There has been market research and effective studies in some items related to choosing which merchandise to sell and sometimes which merchandise to sell at which location that it has popularity of use.”*

With mention above, although it can be seen that some small retail and franchise may exhibit the same pattern of services and operations. However, in terms



of manufacturers some of the retailers were owner or partial owner of the manufacturer of some pharmaceuticals, nutraceuticals, and supplements. So, the retail store also acts as outlet that has competitive pricing for other manufacturers. They also have market studies on generic drugs, supplements, demographic economy, and business development in healthcare giving. It was a sort of in between that they could provide effective generic drugs, nutraceuticals, and supplements to low-income, median-income, and high-income people. The manufacturer also sells their produced items to retailer and distributor that weren't in their retail cluster and receives a good amount of income. For retail operations within the retail and manufacturer cluster, it was also found that they exhibit operations and services similar to all retailers in this study. Although, the pricing of items follow the manufacturer's suggested retail price and follows that of business etiquette in price management, even though they were the producer of items sold their retailer, or partial owned retail clusters.

In provincial, provincial suburban, and countryside can be seen in two groups that retail store that has hire pharmacist was more knowledgeable in business operations as some of them have graduated from business schools and some of them were long time pharmacist retail in the region. These group of small retailer and small retail cluster knows how to operate through knowledge of cost, satisfaction, knowledge, promotion, counseling, and benefits that causes adherence that can gain profit in longer term. Within these knowledge practices, earning customer expectation and loyalty wasn't difficult for them to accomplished. They also have sets of retail store guidelines and expectations from pharmacist and assistants to follow to assure consumer satisfaction. Although, some smaller retail that wasn't strict about rules have typical talks with pharmacists to push for things that they need to see that pharmacist can educate their assistants and lead pharmacy operation to success in business of educating and promotes health in the region. While interviewing with them about their reasoning, it was explained by a Chinese long-time retailer whom manages their retail store that:

*“When work with people, the more you push them with rules and guides to follow wasn't always a successful action, sometimes it causes more stresses when person at work is already having stress. Through repetitions of asking them to*



*continually talk to assistants were ways to keep retail store running, at a pace that it doesn't cause stress as stress makes people forget things, rules and guidelines should be continually reinforce through every action to get it right. This way your employees can work with you longer, like a family member."*

Another retail type that was pharmacist operate, usually have 1-2 assistants also have knowledges in criteria mentioned on adherence, it may come from the traits that pharmacist have and continues to educate their assistants whenever they were in store, around 16.00 p.m. until the store closes. At the time of their assistant working from morning to night, some products that they already know the uses through training and education, they also know which product to choose for which person according to their level of income. This also proves that they understand how to take care of customer and service right product with economical pricing. There were certain checks daily on supplement items dispensed that shows patterns of long term and short-term usage with good adherence. Also, with increased number of customers visiting retail store can be conclude that consumer satisfaction was satisfactory for retail operations and future profits may come from continual visits for purchase and advice on future purchase of needed items.

All of this interviewed information were what can be found in modern day retail pharmacy store. It can be summarized that all pharmacist in each region of Thailand were aware of the retail operations in consumer care that brings continual profits from customer care that creates customer satisfaction and loyalty.

**Within given demographic data and regional economy, were your business able to perform profit and maintain its performance of maintaining profit from regional economy through efficiency in management alone?**

The findings in small retail were found that small retail was able to perform profit continuously from efficiency of management. This was partly done through many analyses of SWOT analysis, power to purchase for continuous consumer, supply chain analysis of all product in warehouse, and efficiency of retail workers and pharmacist to advise on products that were long term use and short-term use with

good adherence. These qualities were found among retailers studied in government and non-government retailer in metropolis and its suburban, provincial and its suburban, and countryside.

All retail exhibits these qualities and were factors that showed strong business management skills. It is also to be acknowledge that all retails have been in business for more than 4 years and prior their settlement in each location the demographic and economy were studied for the feasibility of business operation for consumer care and profits. There were no problems in supply chain management in retail management were seen from efficiencies of using retail software management for supplies procurement. However, delays of logistics were seen in faraway province that makes retail managers to order faster when their warehouse were low in merchandise that needs re-stocking.

It was also seen that retail efficiencies and performance in sale also came from manager's effectiveness in continual training and educating assistants to be able to service customer with knowledge and brings customer satisfaction which served as a basis for more consumer expenses when consumer trust was earned through product's benefits. This was seen in all retail pharmacy settings that exhibit good customer relationship and some have customer relationship software that helps personnel in retail sale operation. During economic crisis from COVID-19 pandemic and continual economic downfall with little or no recovery in each demographic area, all stores were able to continually make profits from long term customer and short-term customer through customer loyalty and customer satisfaction in service and pricing of all products. Managers interviewed, also mention customer came back to stores because of high availability of economic products and good effectiveness.

**Were your store clerks able to make profit continually through the use of limited data provided by normal ways of business management? Please state your answer.**

From interviewed of retailer and distributor in government and non-government, it was found that with experienced store clerk, that continues to work for

more than 1 year, profits were continually seen through their knowledge of products in store that can sell in single and combined with other products. The total time to train until efficiencies and performance can be seen was around one year in normal retail operation, meaning that they were able to perform without needing to study more on basic information regarding products in store. Also, normal work on supply chain management and warehousing were acquainted without needing help from store manager. It was found that all clerks were efficient in their operations, which served as a basis for efficient retail operation that can bring performance in sale.

All of retail store have these qualities and were able to sustain competition in retail service in healthcare among the demographic area studied. It can be summarized from a retail quality pharmacy manager below.

*“The efficiency of clerk and workers within store usually comes from day-to-day communication and education from retail pharmacist that they continually speak about the knowledge that they have and strengthening clerk’s knowledge to remember correctly and update any news on indications and usage for each product. This was useful because some products can have many indications that their potential to sell were untapped by extra knowledge in supplement usage that pharmacist and assistants have. Also, with the retail customer management, products dispense can be note that it was used for other indications. This type of readiness for pharmacovigilance also serves as a point for future research studies that may be important for finding information to support new uses safely for the Thai society in the future.”*

**Was your retail store able to keep up with supply chain from current management? Please provide answer.**

With conventional software that were available for enterprise management, it was continually improve for around 20 years until today and many competitive enterprise management web applications of similar or different type were available for use for enterprise management. This type of retail system was still in use similar to

retail pharmacy software that wasn't clinical base that was used in quality retail pharmacy stores or franchises.

All of the operations within all retails that uses different type have conclude that their retail management software was effective in management of supply chain for all products. It was effective when headquarter was out of electricity and wasn't a disrupt to all small retail cluster or franchise as each retail have a software installed in each retail sale system. The software can work offline or online with a 24/7 server in web application server that were able to provide extra information management. This creates system resilienceness with no downtime in server operation. Communications with suppliers and availability were usually made continually and knows in advance when supplies would be short from distributor and manufacturer for some items. So, stocking of supplies in warehouse were usually done manually by telephone contact to many distributors. This type of behavior in management was seen in managers whom knows how to operate with resilienceness, similar to securing items for customer who's valuable to retail store or franchise.

There seems to be no problem in acquiring the stocks need to refill the warehouse on many items for most manufacturer of supplements, including bacopa extract from government manufacturer. Although, the time for logistic was longer for faraway provinces that they have to re-order at a faster time. It was seen as beneficial for the manufacturer also that it can be use to forecast amount to manufactured correctly when faraway retail and distributor had to order faster and in conjunction with metropolis distributor ordered, an amount that saves time and money in manufacturing operations were seen in government manufacturing interview.

**Please explain about your store management after synchronization, how well did it perform in terms of efficiencies and operations.**

For store management, it was found very easy to use and manage with current enterprise software in retail management and clinical retail management software, when everything can be done with the computer station use for Point-Of-Sale and reports. It was seen easy to operate for government retail and non-government retail in

the metropolis, distributors, and retail in non-metropolis areas. It can be summarized by one of the managers below:

*“For web synchronization, it was easy to access customer data when they report each click on web report, it shows up in the back-end system for retail manager. This enable assistants and pharmacist to check how consumer were doing with their supplement adherence, it was very easy. Also, when you can remember the customer whom bought the bottle, you can easily ask them if they would continue for the next bottle that they found useful in effectiveness. Usually, with the web synchronization, a report was also put into enterprise retail software, clinical retail management system, or customer relationship management in pharmacy retail software that weren't clinical base. When customer comes in, they may be asking membership number or some identification for checking purchases, when found with bacopa use the pharmacist and assistant may ask for the adherence and continuance of use.”*

Another manager also added that: *“It was easy for managers to look at participants and came up with results that how many bacopa extracts should be order for the next order that will be enough for user within a demographic area that retail pharmacy covers the entire population. By just clicking at the retail back-end system, it will show how many pills were used and how many were left in the bottle and in conjunction with the retail management application that is in the retail computer, number of bottles can be look up. With the note made by the pharmacist or assistant, the sticker code was able to identify purchaser and amount purchased. This is important because in the suburban of provincial and countryside, there were less of retail pharmacy and many people came to town to purchase drugs and supplements when they don't feel like going to the hospital for physician's help.”*

However, mostly in retail setting that were provincial suburb and countryside, many consumers were well acquaintance of each other and retail workers can remember them from their repetitive purchases. In large retail settings, there were many people in the region and a help of software computer was more helpful in identifying customer, their purchases, and clinical data for use with retail sale and drug dispense safety. This was true in some area, but the well known of pharmacies



within a region may be different from situation to situation, some pharmacies in the countryside may be full of customers similar to large retail settings, this is because the availability of retail pharmacy stores wasn't much, largely the retail pharmacy may be purchasing a lot of drugs and supplement in huge bargain and sell for less to gain customer and popularity. They were able to sell at cheaper price than government pharmacist whom open their own stores nearby also. From all retailers interviewed, all found that the web synchronization had lessen their time to re-stock supplement faster than before. Also, some managers have their assistants also bring up a check list of long-term vitamins and supplements on retail customer retail system, to be check together with bacopa extract re-stocking. It would be a constant review that they can do it in a routinely and make a check list of probable time that customer will come back to store and ask for adherence that can be forecast on next re-stocking, it was to be use with repurchase forecast for warehouse stocking. It was seen as useful and all manager agreed that it would change their routine management in the future because it gets thing done faster and more correctly when calculate with demographic

In summary, the web synchronization was use with current retail management effectively and also have minor changes in some of the retail management operations that were found to be useful in conjunction with web synchronization system. It has added some strategic planning for retail forecasting and customer service care operations when retail computer system had come to a point that was important in customer care and adherence management. This also helps improve supply chain resilience when forecast was made easier through information obtain from web synchronization.

**After synchronization was your operation well performed in profiting and gaining profit margin in food supplement market sector in untapped areas?**

When view only bacopa extract sale, it performs very good in sale performance in profiting in long term. Food supplement and vitamins that was use with bacopa also gain benefits of selling when assistant and pharmacist have educated geriatrics and working people that were common users. In performance, all retail store types have seen increase in profit for long term use and there was new customer each



month when assistant and pharmacist have continued to recommend the supplement for the stressed, health deterioration, memory, and learning.

The actual number of customers were more than the number of subjects in the studies but some of them didn't enroll in the study due to age wasn't in the scope of study and also some lived far away from the retail store that at the time of subject recruiting. Some of these people, were also long-term user of bacopa for the indications similar to subjects in this study. So, the actual number may be more than numbers that show in the web system within this study. On average, variations in profit were about 2-3% increase from last year in small retailer and 5-8% increase in midsize retailer, depending on locations of retail business and competitive retail store. For distributors in metropolitan and faraway province, there were increase in sales about 10-12% from last year due to more order from small retailers that were beginning to stock Bacopa Selext. Bacopa extract uses were continually increase in production to serve retail store supplies all over the country and a strong number increase in Bacopa extract stock and sale will increase through its nature in long term use for memory and recall for geriatrics and stress improvement in middle age workers.

After synchronization the warehouse perform very good with the amount of bacopa extract dispensed. The re-stock for supply chain has no problem with delivery, although some retail in long distance region may receive their orders later than retail stores that were closer to distributor or manufacturer. Variations in small retail store orders from different distributor was also another factor that may affect profits, however when it comes to product shortages due to customer purchases more than usual within one-week, small retailer would order from nearest distributor in their region. This doesn't affect total income much for some retail, as described by many retail managers that sometimes, they ordered from different distributor when warehouse stocks decrease quickly for Bacopa Selext.

When ask about the profits from untapped market in terms of indication, there were some customers whom use it for insomnia and epilepsy. These were advised from other herbal practitioner that it can be use for epilepsy, however it needs to be confirmed with physicians first for conditions suitable for use. For insomnia, it was

short term use for people who were stressful and prefers herbal alternatives more than pharmaceuticals. These were occurring trends that may be seen with pharmacist advising Bacopa Selext because it is more effective than non-extract bacopa. The profits within the untapped area were very small but it shows an effectiveness in terms of use for insomnia. Recently, there were usage for attention deficit disorders but stores within study have not shown dispenses on this indication yet. Although, there were studies on effectiveness of use for attention deficit disorders in the recent year. The profits from each store manager interviewed ranged from 0 to less than 1%. There have been people whom consult with the pharmacist that came with insomnia but some decline to use because their experience with other supplement and herbal blends were unsuccessful. This was also seen as one of the barriers that may be difficult to dispense a successful bacopa extract that would be effective to treat insomnia in long term.

With the pharmacist and assistant giving education and consultation with reminder that web synchronization can help them in the future when it can present data to physicians and researcher in the future, many subjects returning to the stores were shown to be more adhere from education and consultation. It causes an additional awareness that long term supplements can serve as data for future use that were also important to them when physicians can take data into consideration for future regimen given. When consumers were asking of their adherence, managers refer web synchronization as;

*“The customer was very happy that they have a tool for helping them to remind their bacopa adherence but happier as they knew that the data, they input would be useful for clinicians in the future and medical studies that can be made to find new drugs for people in the society in the future. It makes them more valuable to society as they were contributing to something larger and felt more responsible to whole country.”*

**With synchronization were your workers able to complete all tasks effectively given by managers? Please state its usefulness.**

The job functions given were able to complete faster than before, when forecast wasn't need for people whom were in long term adherence and inform the retail through web synchronization or at retail store in person. It was found useful in many retail settings that were small retail when they can check through the system of how many people used how many tablets and would confirm bottle purchase in long term use. This doesn't delay in order amount confirmation with the retail manager or owner. It also creates confidence when everything was checked and confirm from the consumer in the web system. It was agreed by all retail managers that they finish the amount to re-stock in warehouse faster and more effective. The visibility of product usage can also tell profit earning that can be approximate in each month or quartile. This was important because sometimes it can be calculated to approximate budget and ability to pay financial institutes on time. This can foretell the survivability of business in a competition in an area also.

One of the retail store managers in provincial area of northeastern part of Thailand said; *"It had become something like pre-order for the next re-stocking of consumable items and forecast could be made faster for stocking within a length of time. Also, additional stocking for an amount that can support future customer within the region. This has become something that feels easier and more confident in retailing for consumers."*

All retail managers agree that with web synchronization it helps pharmacist and assistant to spend more time with customer adherence and find ways to improve their communications better, so consumer will continue to use the product in long term. The time spent on each customer were about less than 5 minutes when check thoroughly, but its customer felt very much appreciated because they felt care after talking to the pharmacist. Also, after talking to pharmacist about the importance of the study, the pharmacist also feels more useful to the society and more professional from the fact that long term bacopa use may lessen amount of time to hospitalize for cognitive and memory deficits in aging people. Similar to that of certain cardiovascular medicines that lengthen the time to hospitalize patients in many medical adherences study. From the web synchronization use together with the retail software system, assistant and pharmacist feels more confident in dispensing bacopa

supplements and vitamins for the elderly and individuals who had chronic stressed from work.

**With synchronization data, your store clerk able to make customer adhere to product use continually? Please state your answer.**

For retailer in the metropolis the store clerk was able to make adherence through education on correct use and benefits. Further consultation was in the safety of use for long term self-care and conditions involved. Synchronization was able to make an every day awareness that store pharmacist and assistant may check web system for total usage at the end of the day, usually takes no more than 5 minutes to summarize total tablet used and near empty bottles that needs to contact consumer, as a reminder that was an addition to e-mail reminder that can appear on modern android phone system. Continue adherence in consumer were seen in all government and non-government retail stores, including distributors in some regions.

Certain forms of communication were seen in contact with customer when long term use was confirmed from the customer, the web synchronization also makes pharmacist and assistant feels unembarrassed when they phone the customer or contact through applications. It makes contact more professional when used the web synchronization and felt that it is not a form of telemarketing. The successful of long-term adherence and continual of professionalism between consumer and retail pharmacist continues to grow from one customer to another at a steady rate within demographic area. It was agreed by all retailers that web system was effective tool in adherence and professional communication with customer that brings satisfaction and loyalty. It serve as a tool that open up consumer behavior and further conversation that can lead to better service and trust.

**Does synchronization perform supply chain management effectively? Please provide information regarding sustainability and profit margin increase if any.**

There were variations in effectiveness of supply chain management, in some retail store that begin in this study had bacopa extract as a product that they have as a

product that may attract customer from another retail that has the product. Although, they were far apart from each other but it was on shelf because there were customers whom ask for the product because they don't want to travel to another town. From this retail setting in provincial suburban retail, in one store a small supply in warehouse was continued in a small amount but continual growth also continues grow in small amount, efficiencies were incremental but, in the future, it might be more when people learn the benefits.

For other stores in metropolis, supply chain management function effectively with the use of web synchronization system. Faster confirmation of orders was done faster for consumers when contacted or confirm through web system. With demographic region and economic studies may derived an amount of future growth in customer when product shows its effectiveness and medical news and verbal marketing from people to people may increase needs and market availability of products. All retail exhibit good communication with government manufacturer and distributor in securing supply chain, they were able to make successful scheduling and forecast logistic time to reach their store that doesn't cause disruption in retail service during busy hours. With the use of computerize enterprise retail management and clinical retail management, they were able to secure supplies within the time. Also, with the availability of distributors within each region of Thailand, a resilience in supply chain for bacopa extract was also guaranteed that Bacopa Selext would not be scarce due to booming product use or increase demand in short time that may cause disruption in supply chain for government manufacturer.

Increase in profits were as mentioned before that small retailer, midsize retailer, and large retailer or distributor had profits of 2-3%, 5-8%, and 10-12% respectively for Bacopa Selext. This success comes from that fact that supply chain management in retail managers, distributors, and manufacturers contributes to success from good communication through synchronization that has web system as visibility.

**Do you feel that synchronized data at were enough for the operation of your store management in terms of forecasting sales, re-stocking products, improve sales, and make promotions? Please state your answer.**

Many felt that web synchronization was alone enough for Bacopa Selext because in a manager's own feeling, it is like a small system that act as tracking and scheduling that is like consumer information system. It can be using side to side with the conventional retail software management system. It helps manager track customer usage and verify numbers need for warehouse stocking. Number of customers in use and increase in use may be compare with warehouse stocking numbers and compare numbers to get a pre-order number for next warehouse order fulfillment. Although, the final number may be confirmed with customer first before finalization of numbers to order begins.

Synchronization with current conventional system can start forecast sale when pre-order was confirmed by customer. Together with current new customer and probable customer from available demographic population that may seek Bacopa Selext from available data on demographic region analysis or retail consumer analysis, a statistic calculation together with re-order stocking calculation can be made. Improve sale can be made when they come back to check adherence and effectiveness. Also, many additional items in terms of vitamins and supplements may be add to current Bacopa Selext. This also improve sales in other supplements. One thing that can be seen in sale improvement is that customer communication brings retail service and customer closer together. This improves relationship between pharmacist or assistant and customer. More conversation brings more trust, partnership, and the ability to understand more about consumer health concerns, needs for health conditions, and what can be done to solve their needs at what price. These can be determined by adherence at first point then progress to further condition needs. The pricing of bacopa extract was seen as promotional price already because it was economical, although it was seen that about 82% of retailers can make promotional sale through communication with customers, both in study and outside the study. The promotional price of 5% given, was able to sell 2-3 bottles by short-term user and long-term user. Also, these were explained that the product was relatively new, the



availability may not be available if disruption happens at a level that product might be delayed.

The data was found to be enough for continual use in store operations that conventional operations can't do, the tracking system that reports patient usage from home was very efficient when work with conventional system to acquire customer adherence and, make sales, and reserve Bacopa Selext bottles for them in the future in terms of promotion sale also. In terms of promotion, after many months of use retail pharmacist also found that effectiveness was the key to promotional purchase and that promotion price reduction wasn't affected towards their decision. The reason was that Bacopa Selext might be scarce one day if more people begin to use. Also, the effectiveness was from alleviates from chronic conditions and better feelings in their mental status with better memory were seen in many consumers who bought promotional pricing, so perception of "extract" wasn't something that they report as effective or more effective.

It can be summarized that all retail service operations were better with web synchronization system and warehousing operation system. Consumer adherence also help increase in sale performance and effectiveness of pharmacist and assistant to help increase sale in Bacopa Selext and other supplements that can be use together to enhance consumer health. It doesn't increase profit in Bacopa Selext only but also supplements also. This also help some retailer within the study to increase their profits to be able to pay for the current business debts.

**Do you think that with better web-based system can derive a system for digital patronage use in conjunction with daily routine to make adherence more involve-able? Please state your answer.**

It was seen that retailer in metropolis and metropolis suburban were eager about system for digital patronage use, they were already acquainted with tele

pharmacy concept that were in meetings for government sector and private sector. Although, current system that was available for use was through social media connection and chat through available tools provide by social media system such as Facebook and Line. If there was a system that can do something similar but more oriented to pharmacy practice, it will very good. In a group interview, many managers agreed that:

*“It will be very good if a video conference can be included in the digital patronage and functions in retail service such as taking notes for pharmacist, interactive buttons for communications with people with less ability, video recording for playback, and adherence tracking like in this research but more optimize for other supplements and conditions would be a great help to pharmacist in retail setting.”*

Another adds that:

“Digital patronage may help make retail pharmacy more accessible when long distance can be a problem and sending mail order may be cheaper than travel. Also, the functionality of web system may remind pharmacist of certain list of things that they can cover on education and promotion that makes sale operation smoother and more effective. These were some of the things that digital patronage may help more than a web system that tracks and report. Furthermore, it can be added to digital city that were recently develop by the government for easiness of whole country population when they can process certain things electronically, without having to travel long way to government offices. So, if digital patronage can be added to private retailer and government retailer would be very good to make things easier for people living in Thailand or consumers.

**In what ways does synchronization can help solve your store? Please provide details.**

Many of retailer found that synchronization solve barriers to communicate, it seems that subjects were more cooperative than other customer that bought Bacopa

extract but seemed not to care much of the web tracking synchronization. One of the managers said;

*“It might be later that maybe they would accept the web synchronization when they start to learn that web user synchronization system can help them in the future, directly and indirectly. Although, some may think that they don’t need to use the system for the current time and later would use the system when they feel more active.”*

Another added that:

*“With synchronization as a tool for adherence, continuous care, education, and consultation were performed to customers. It was seen that negotiation for buying more bottles were better in sales. It might come from the nurture of care and appreciation of customer that also affect amount purchase because they feel care and product was also good for them. This was one of the good things about Thai culture that people were helpful of each other in the community.”*

Provincial retail manager also added:

*“After training people for some time, there was nothing else to do because they knew their functions throughout the day, week, and month. It was routinely set for each employee. However, when web synchronization come into addition in retail service role and retail operation, there was something great about it that it increases efficiencies and sale performance within the retail setting. Everything was more professional with more roles and duties to think about while completing each job that came with web synchronization and its visibility. With the web system, the pharmacy retail gained more customer trust and employees were making efficient sale with more professional communication and care towards customer.”*

For all retailer in the study including government and non-government, it was found that warehouse refill operation and retail stocking was faster and more effective because the process was done every day. At some point, when a confirmation can be done it was done on that day for pre-order. It was seen as the web synchronization doesn’t waste time while waiting for customer to visit retail store. It was seen as more

operations were done daily to satisfied customer service also. When all of these happen, employee starts to see the trends of bacopa use in consumer within demographic region, they can also estimate its growth with existing customer and future customer in existing customer dispensed database. As mentioned, more efficiency from employee can be seen because when web synchronization gave them visibilities, they can connect how retail operations can function better. They also know their role and responsibilities better of what to do with and what to say with customer in a continuous manner, every time when customer visits or on a phone conversation for next order.

These were things that can be seen that synchronization can enhance store operations and service operations that can make retailer more efficient in service, satisfying customer, and make more profits at the same time from promotion and loyalty from continual good service.

**Does synchronization solve problems arising from product re-stocking and warehousing? Please provide information on how it helped you solved the problem.**

In terms of frequent contacts and continuous collaboration, reports on amount produced by manufacturer and report by distributors also help retailer to estimate their purchase during their operation. Although, when there were heavy purchases in other regions, reports were also received by retailers so they don't miss stocking. This was one of the strengths in synchronization that retailer, distributor, and manufacturer shares information to stock their warehouses properly and prepare for market increase in demand. Furthermore, the information on customer usage were shared among retailer and distributor to manufacturer, this gives approximate amount to manufacturer to estimate market size and produce the right amount for future needs that weren't a pre-order. This help reduce time to operate on retailer, distributor, and manufacturer at the same time. With the operations mentioned visible, it was agreed by all retailers that they don't have problems on restocking and overstocking. This was seen very helpful to retailer and manufacturer because overstocking can cause a

lot of damages in profits more to retailer. This was because retailer would be more burden with less profit. In some retailer, more unpaid debts would cause retail operations to seize when it can't profit anymore in a region situated.

From synchronization, the ideation was also use with other drugs and supplements in the store, where long term use was also check and adherence style from web synchronization were applied to service operations which received satisfactions from other customer also. Any long-term use was searched and ask with customer if they would order at a promotion price, similar to consumer adherence in the study but without telemarketing. This was seen very effective in retail operations and also have help better forecasting and restocking warehouse at an appropriate level for current user and increase number in the future, for all consumer searched within pharmacy retail management software, that were clinical oriented or enterprise oriented.

**Did synchronization and web-based data help you keep up with customer adherence and store operations to increase profits or revenues at most or some way. Please provide answer.**

The web synchronization help kept all data concerning consumer adherence on a daily level and store operations in servicing customer were better when web synchronization was used with conventional retail management software system.

A manager from government retail said: *“There were increase profits seen, as mentioned in earlier topics. The increase in profits were around 6.8% during the first quartile of this year, for all retail. Increase profits in sale performance was seen during service operations that were more efficient through technological help and more cooperation from consumer were also seen when their health conditions were relief. All of this came from good adherence and better communication with customer. Customer were seen more taken care of by nature of web synchronization that help pharmacist and assistant to go through important things required for the analyzes of consumer behavior. This driven pharmacist and assistant to be more efficient at communication and make better sale performance.”*

Many managers in metropolis and outside also digress with retail manager from government retail that it does increase efficiency in customer service operation that increases adherence and also increase sale performance. It also increases retail values that have more care than other competitive stores within the region. It can be seen from one of the retail managers that:

*“Web synchronization made my store look better when Bacopa Selext was studied, it made consumer felt more care through technological help and were closer to pharmacist because they talk more to each other and more help was being done for their conditions.”*

It was also observed by the retail owner that adds:

*“This brings customer satisfaction and continuous care from pharmacist brings loyalty. They come back again and again for the service quality received. Customers were seen more to accept whatever pharmacist would select for them at the price they can afford, this portrays customer’s trust in service.”*

The comment was from one of the retail stores in countryside, which level of education may affect customer trust because pharmacist seems to be highly educated people and knows whatever they converse about. When the comment was given, it was further brought into discussion within the interviewed group that did the same thing happened to retail store in metropolis. One of the retail managers from government said:

*“Sometimes when customer was educated people or self-refer the trust seems to come from informed product information and consultation that each ingredients fits their needs for what indication. It was like helping them to choose which product fits them. It might sound like a personalize pharmacy practice, she added.”*

This was agreed by retail pharmacist in metropolis suburban, provincial, and provincial suburban that they also have the same situation but not frequently.

In summary, it was found that small retailer had continuous increase in retail profits from continuous care and advice from pharmacist. In a franchise and cluster



retail also seen continuous increase in revenues and all increase service involved has made franchise more valued than before.

**Does web-based synchronization solve problems in terms of business operation concerning cost-adherence, pricing satisfaction-adherence, knowledge-adherence, promotion-adherence, counseling-adherence and benefits-adherence that can gain profit margin. Please provide your experience.**

From integration of web tracking, it was found that customer service was solving problems in retail operation excellently. In service operations, there were constant checking for adverse signs, allergies, and symptoms that can persist if any. Effectiveness was constantly check and review, this contributes to long term adherence. It was determined by consumer's self-explanations. If consumer felt that they need more supplement, vitamins, and pharmaceuticals that can enhance their conditions, it would be dispense at the pricing that they can afford.

Checking web system every day for each consumer, also help employees prepare for their communication and important points to discuss with consumer. This was seen as promotion of good service for the health of customer. It also serves as customer review, what they purchase in the past and able to determine the size of their pocket money expenditure when some promotions can be push and some promotions that can't be push towards customer's purchase. It also makes room for new strategies to come up with promotions of goods that can be use with Bacopa Selext, when customer felt they need more supplements.

With all the retail management operations happened, supply chain was secured in an amount that corresponds to current long term user and extras for new user in the region of retail operation. Also, one of the managers also mention that with their service operation increase in effectiveness, there were also a number of new faces of customer showing up at the retail store also. This might come from the fact that people may be start talking about new services that were available to them at the present time and other customer can benefit too.

*“After sometime when web synchronization was implemented at the store, about a month later there were new customers that came to store and also ask for advices on supplements. They were referred to the retail store by their acquaintance and friends, which was really surprising. This was good because number of customer visits per day wasn't high as compared to other retail within the cluster that were situated in local market. It causes stress in workers whom doesn't make much sale but salaries were dependent on retail clusters that were situated in better area for making profits.”* One of the retail managers said, in a suburban setting of metropolis. The visiting of customer within the region was a sign that better customer service through web tracking also portrays quality service that customer can depend on for a long-term partnership in customer's healthcare. It can attract more consumer to come for service and enable store to make more profits from customer trust and service loyalty.

Another type of profit that can be seen was from a piece of information at the end of discussions and interviews, all managers were agreed that

*“When selling bacopa extract, certain vitamins and minerals that may help in mental stress and memory were also sold with bacopa extract, this also creates profits that also help sustain income to the retail store. Further questions were made with people whom came for vitamins that stimulate mental and improves memory, they were also ask about supplement that they use, and bacopa extract were also introduced with moderate to severe conditions that their indications were effective. Customer after purchase bacopa extract were really happy after their use more than one month was effective. This also help store to gain customer satisfaction and loyalty.”*

In summary, benefits of adherence and retail operation services regards shows customer trust and loyalty. Also, these trust and loyalty had also brought more customer to the retailer because of its excellence in service that customer can depend on. It also proves that service customer with care and adherence in mind, also lead to effectiveness in improvement of conditions that can lead to customer loyalty and reputation. From continual good reputation in service, it can help attract more customer to the retail for good service. At this point, many activities of reviewing cost-adherence, adherence pricing, level of language communication of knowledge

that contributes to adherence, promotion for long term adherence, counseling for better adherence and benefits that made impressions for everyday adherence can be determined and give service to customers. All of these activities can lead into profit marginal gains exponentially or incrementally through long term retail service in a region.

**Does synchronization help you ease with gaining profits and customer trust within demographic data and regional economy efficiently, leading to profit performance? Please state your answer.**

It has been found that synchronization helps gaining customer trust after first implementation of web user system. This creates trust, as a starting point for long-term selling, not only Bacopa extract but also for other items in retail store. When a pharmacist gained trust continually, it creates long term loyalty for the retail and easier for pushing certain items to customer that fits their needs. With Bacopa Selext, synchronization was able to create a type of service that makes retail service more meaningful and more trust from customer. Moreover, it creates a point where more healthcare giver can tap the information for their needs. It makes small retail becomes a part of whole healthcare system, with IT integration.

The research found that web system had no problem in age range and barrier was only from language that came from uneducated status in geriatrics. There were no problems on web use for people who were recently retired and among those retired for a decade. This was from the fact that computer technology with user interface and internet capabilities were in continuous use for more than 25 years. So, the web user system was easily integrated into retail service and easy to use for all subjects in the study. There were no problems in creating customer trust and continue adherence in Bacopa Selext and also continuous profit were made in regional economy that each retail store was situated in. The continuous profit wasn't affected by economy status that change throughout the year. In countryside, the pricing was affordable because people in countryside weren't poor, they were self-sustainable by the help of King Bhumibol and Royal Chakri that had been going on for more than 50 years through

each region of Thailand that doesn't have good agricultural development in the past. Also, the self-sustainable people in country side they use money wisely. From this fact and effectiveness of Bacopa Selext, it could be said that the product could continue selling in the countryside regardless of economic changes.

In the research when income was shared among retailer, distributor, and manufacturer that had aware that income from single people in range from fifteen thousand baht to thirty thousand baht seems to have equal amount of available pocket money after all expenditures on food, clothing, and housing. They were able to purchase Bacopa Selext at promotional price if there were needs to store items for self-use if short supply can occur. This was something that all retailer were aware of and all agreed that the information was useful to for them to take care of consumer and give better promotions according to their income statuses. From visibility of synchronization, it helps retailer to determine customer in region better and was able to carry on promotions that lead to profit performance.

In summary, the visibility of web synchronization and information sharing lead all retailers to look further into customer income status and give a continuous affordable promotion that can lead to profit performance. From the perspective on single people sale efficiency had no difference in sale effectiveness in married couple and geriatrics living alone or family. The effectiveness of Bacopa Selext and web synchronization on consumer behavior from web tracking and usage information sharing to retailer has led to increase sale efficiency and performance. It also sends information to manufacturer to increase production for securing supply chain amount need for increase market needs. This things resilienceness to supply chain in Bacopa Selext and secure continuous income for retailer, distributor, and manufacturer.

It was also seen that profit performances were seen in continuous sale performance that each monthly income for Bacopa Selext was significant and continue in growth from the year prior. Profit performances also shows good number around 5 to 9% in medium to large retailer and 3 – 7 % in small retailer, from the second quartile in this study. Although, the number derived were from calculations of income from subjects in the study. A real profit performance can be larger than existing percentage because all of Bacopa Extract have not been reveal and the study

population size was limit by age size also. Further synchronization study can be done more if size in age limit can be extend to further limit and cover more indications, for example indications in teenage use. This would give more information on sale performance and profit performance in each quartile of business operations for all retailers, distributor, and manufacturer.

**Were your store clerk able to make profit continually through the use of limited data provided by normal ways of business management and does synchronizations help it better? Please state your answer.**

With normal ways of management, store clerk efficiency and performances were limit to buying, selling, shelving, and warehouse stocking. Customer care quality was limited to experiences of employees and communication skills that takes time to profess. It was seen in pharmacies that synchronization does help employee with minimal experience to excel in communication that brings adherence, similar to pharmacists in many retails. Although, the level of care that need for patient with chronic diseases and progress to new diseases may be taken care better with a pharmacist's help. Synchronization also helps employees to take their time and spend it on each customer that uses Bacopa Selext, for adherence purposes. This was seen as planning for customer on adherence and communication. It sets employee into a mindset of service mind for taking care of customer and also find ways to give better promotions that brings continuous profits to retail in long term. With these qualities, it can be seen that retail sale performances will have a good prospect in the future and better visioned goals. As mentioned by one of the manager retailers below:

*“It can be seen that with normal non-synchronize conventional management, the customer comes in, buy, and go fashion. They come back when they have good price, good advice, or good service. In this fashion, you don't have anything that you did together. However, with the synchronization, you have web user interface, activities that customer and pharmacist did together, and continuous talks that brings better health and reduce concerns in customer. All of this made more profits in long term for retail and increases retail service values.”*



Another small retail manager mentioned:

*“Before synchronization, retail was making sale about 45 bottles per month in a quartile earning. However, with synchronization, it affects consumer value toward Bacopa Selext more when they knew more benefits of Bacopa and more benefits of web system that can be use in the future with physicians and other healthcare givers. It has been a favorite by many consumers whom uses the system and it increases customer satisfaction that leads to more cooperation than before. After these practices with consumer service, more trust between consumer and employees were seen and continuous profits can be seen from continuous services. It can be seen that they begin to buy more than one bottle to secure their long term uses. This can be seen in the 2<sup>nd</sup> visit after they purchase the first bottle. Also, they buy more things that can be use with bacopa such as vitamins, minerals, and supplements.”*

This can summarize the importance of synchronization that that it increases service operations that brings more profit and increase sale performance than the conventional system that were limited to cycles of “giving advice, buy, go, and return if need more help”. Synchronization also helps warning retail managers to prepare for their warehouse stocking and re-stocking because supply chains could be affected by the increasing number of Bacopa Selext users. There were reasons behind this as medicine were getting better at helping human to live longer, the number of geriatrics also increase and more demands would come from conditions of stress, anxiety, and the need for memory and learning. Also, stress from work was also one of the rising conditions in middle age people that may need supplements for stress and Bacopa Selext was one of the effective choices for the condition. With the quality of Bacopa extract alone, it also helps in many ways more than stress. It can help insomnia, attention deficit disorder that, memory, and cognition. When consumers knew about these benefits, Bacopa extract may be more favorable for selection and long-term usage.

**How does synchronization help your business better in terms of overall retail management?**



It makes employees having more service mind and more consumer focus on their conditions and what can be use together with Bacopa Selext in long term. Also, choosing the right price for each customer was seen as very effective and it brings customer happiness. They get many things for low price and good promotion.

It makes forecast easier and more precise with predictions in future market demand, so stocking of supply chains was constantly renewed without huge decrease that affect availabilities of products for current user. This was seen as effective management for supply chain and better profits through increase effectiveness of employees and better sale performance in each employee that contributes to profit performance for each quartile earnings.

It also creates employee more valuable to their work with many things to do and felt that they were more valuable to an organization, that everything put into work was worth the earning that they received. They felt more responsible as an employee and work contributes from web user's customer care was found as something good and felt that they have care for the society better than conventional management. In long term use, they valued themselves more and felt more happy working at the retail setting.

All of these happening at each retail store, each manager was very happy about their employee's efficiencies and gave in an interview that they were more productive. Some managers also mentioned that:

*“Web synchronization also made them felt less stress because they have something to do, even though before this time they don't make sale much because of economic downfall. This causes stress in employees, sometimes when economic wasn't good, it causes managers to review merchandises. Managers had to go through a lot of recent sale performances in the past, which customer uses which before picking each product to stay and each one to discontinue. Another factor was that, if changes were made to merchandises, will customer purchase the new merchandise or not was another thing that will determine the survivability of retail business in a demographic area. This is all because of the affordability in pricing and consumer's power to*

*expense. Economy isn't easy when it affects large group of people and pandemic also causes manager's stresses in management."*

It was seen in managers that manages retail in metropolis and metropolis suburban that web tracking made their business look better and more competitive, it also creates business value that were seen as additional care service from the retailer and government manufacturer without having to pay for. Also, they could use the information on supplement tracking to talk to their physicians and healthcare giver. It was something that deemed as professional help to customer and customer felt that they can healthcare giver were more dependable than before. This gives reasons that information technology when use to solve consumer problems can lead to better outcomes for everyone in the responsibility of customer healthcare. Moreover, information technology also brings ease to operations, it can lessen work time and employees work more efficiently than before.

**How does synchronization help your retail sustaining items supply chain and minimizing shortages in short term and long term? Please provide answer.**

In web synchronization, the supply chain was secure through continuous communication within the group of retail, distributor, and manufacturer. Any abrupt change would cause communication that would bring issue to discussion. The information was shared among all people involved; synchronization information was transparent at all level. Any pharmacist in retail sector and manufacturing sector can view information on uses and talk with each other on the pre-order, stocking size for new customer, an amount extra for logistic disruptions, and sizes for market trends in use. A pharmacist manager in government retail gave a brief that:

*"About 20 years ago, there was a market trends of GPO curcumin uses that made a lot of money from the market because it was innovative product for skin beauty. At that time the manufacturer was able to solve supply chain problems through manufacturing efficiencies. Also, with Bacopa Selext, the same strategy was use because Bacopa Selext technology was also more advance in extraction method utilized and dosage form was also easy to sustain manufacture without disruption in raw material supply chain. It could withstand heavy market demands like GPO*

*Curcumin trends about 20 years ago. However, with the use of web synchronization together with clinical retail management software in conjunction with manufacturing system they were able to provide good amount of Bacopa Selext to retailer and third-party distributors within metropolis on time without delay. For distributors outside of metropolis, there may be some delay but it would not cause a shortage in supply chain because they were also professionals at business management that were known for supply chain resilienceness.”*

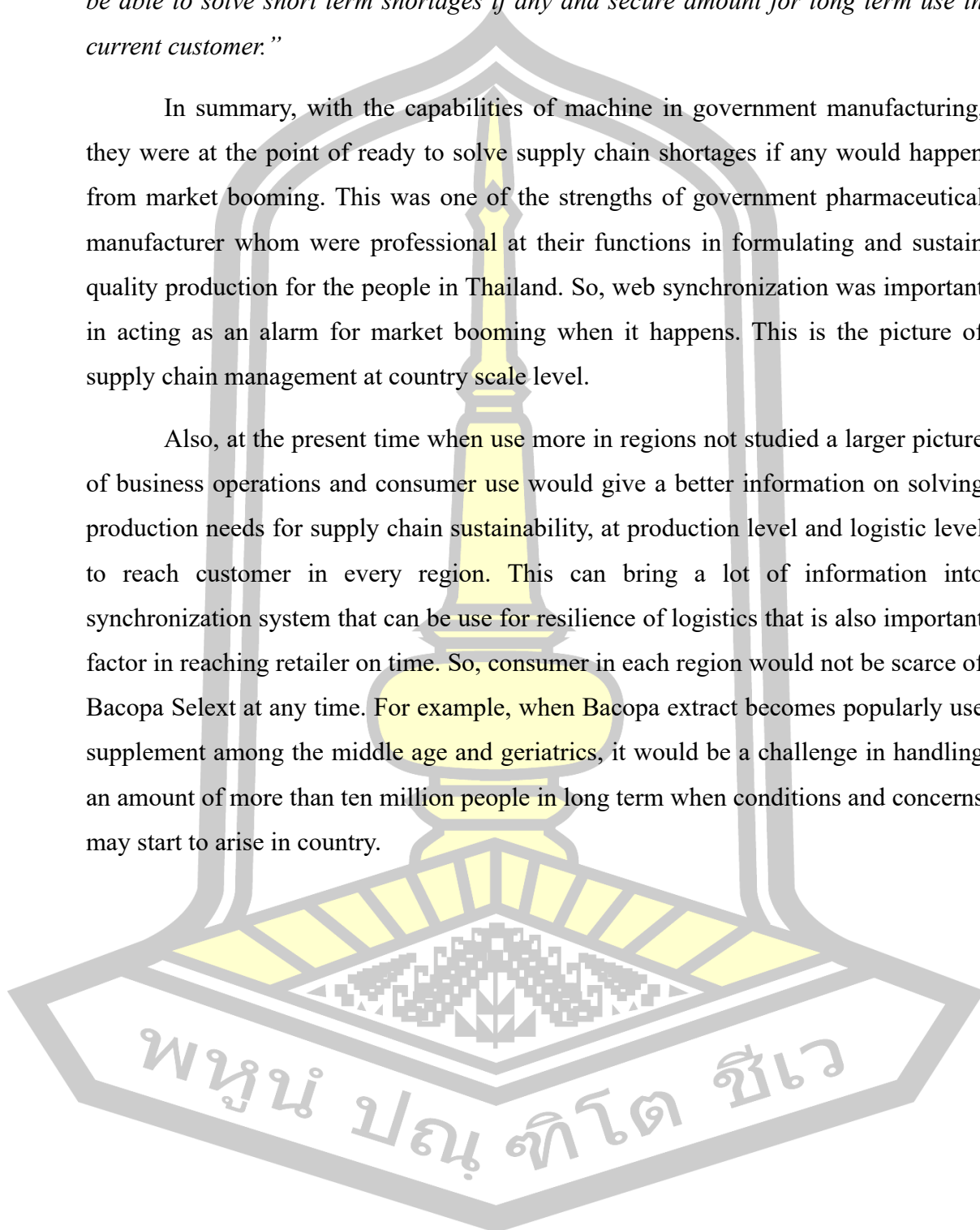
Bacopa Selext had earlier start that saw trends similar to best sellers in the past because the extraction was more special than other types that were made by other manufacturer. It was proprietary extraction method that made GPO bacopa extract more genuine. With synchronization begin to show increase in re-order for retail warehouse stocking, the manufacturer would prepare bacopa extractions for use to secure raw material supply chains. Synchronization help in estimation for market needs and market increase in each region usually reports to manufacturer within each day, so managers can work together to prevent the shortages if it would arise at any point. Although, with the extracted raw materials warehouses that were made specially for Bacopa Selext production line, it seems that it can withstand shortages from short burst in purchases that causes market boom within a length of time. Within this short time, a fast production of extracts would be able to cover any shortages and also amount for long term use within short time. With the information from manufacturer, it could resolve within less than a month time. One of the managers said that:

*“With synchronization, it also acts as alarm for retailer, distributor, and manufacturer to help each other solve supply chain problems quickly, similar to earthquake seismic ground sensor. With currently, looking at the usage every day retailer can summarize data and talk to manufacturer for their warehouse stock needs, which private retailer and government retailer also have same operations in web synchronization. For each region demographic the retail store covered, a number of current user and maximum new user for the supplement’s indication can be determined from pre-demographic studies and disease statistics. At this stage it would look like a picture of a puzzle that hasn’t been complete yet. If in the future web*

*synchronization were to be use in all retail pharmacies around the country, it would be able to solve short term shortages if any and secure amount for long term use in current customer.”*

In summary, with the capabilities of machine in government manufacturing, they were at the point of ready to solve supply chain shortages if any would happen from market booming. This was one of the strengths of government pharmaceutical manufacturer whom were professional at their functions in formulating and sustain quality production for the people in Thailand. So, web synchronization was important in acting as an alarm for market booming when it happens. This is the picture of supply chain management at country scale level.

Also, at the present time when use more in regions not studied a larger picture of business operations and consumer use would give a better information on solving production needs for supply chain sustainability, at production level and logistic level to reach customer in every region. This can bring a lot of information into synchronization system that can be use for resilience of logistics that is also important factor in reaching retailer on time. So, consumer in each region would not be scarce of Bacopa Selext at any time. For example, when Bacopa extract becomes popularly use supplement among the middle age and geriatrics, it would be a challenge in handling an amount of more than ten million people in long term when conditions and concerns may start to arise in country.



## PHARMACEUTICAL MANUFACTURER'S INTERVIEW

Within the interview, there were together 1180 workers within the government system, although within this number were separate into 380 in the retail and distributor management, 552 were in manufacturing and management, and 248 were in marketing, logistic, resource management, and executives. The following questions were answered and items were discussed.

**Does your current management in production operation had efficiencies enough to meet high throughput that meets profit performance in current market and untapped market beyond? Please state.**

It was found that production efficiencies were mainly dependent on the number of tableting machinery alone, the faster the rotation and higher number of tableting station in a machine, the faster the production rate. The production manager was sure that the number of tablet production can secure resilienceness in supply chain to retailers in each demographic area according to synchronized statistic data from the web system and the current system. The production efficiencies still exceed the number of users at current time. If were to put to work together with the current machine in suburban production site, would cover all consumer numbers that can rise unexpectedly in a countrywide manner. Also, it was noted that with machines that were available for use from other manufacturing line can also be used to produce bacopa extract in time of market needs. Below were interviews from managers and employees.

*There were at least 15 in number of still functional machines that have 36 or more stations in it, so the production efficiencies would be in abundant in exceeding the number of consumers in market share. Although, when the number of geriatrics gets higher in the future, with increasing bacopa extract users would require more use*

*of machines, which the current machine capable of output more than 500000 tablets in working shift of 8 hours. If the machine were put on an overtime, it would produce roughly about 1 million per day per station. The number of machines that has 36 stations can cover up 7.5 million tablets per day, or 125000 bottles per day. However, the total number of stations from various machines, capable of delivering 300000 bottles per day. This number was a high throughput number that suffice the profit performance capability in retailer settings. Although, with the newer machines in the suburban adding to current one, a daily production capacity would deliver more than 800000 bottles per day. With this manufacturing efficiency and performance in machine function, it can surely propel profit from current market and untapped market in other indication of use.*

*This means that it can cover production of bottles for current indication and new dosage form for new indication such as improvement attention deficit disorders, for example.*

*In the times of COVID pandemic that may also change the number of bacopa extract users due to physiological deficits from alteration in symptoms that can deficit the neurological function. When bacopa can help alleviate symptoms, if 42% of total population were expect to use the bacopa extract from one day in the future, the same manufacturing line can take about 26 days to resolve, however the actual days would be lessened if other unused machines from nearby manufacturing line within the manufacturing site were to be use. This lessens the number of days to less than 10 days. This is a good number and it can portray that the manufacturer can sustain the number in market to prevent shifting-cost that customer change brand from product shortages in market.*

*Another employee added:*

*Apart from manufacturers' production, third party raw materials in packaging bottle were also synchronize for the market demand. So, if there's any rise in number of purchases in bacopa extract per day at the distributor store or retail store, it would be acknowledgeable by the marketing department that has been watching the synchronization web system together in-review with the current system.*



*So, the production time to logistic would be less than 3 or 4 days to reach the retail pharmacy within the suburban of Bangkok. For provincial would be less than 1 week, depending on distance. So, the production in efficiency would cover up the entire national area. With the web system tool, we can also monitor tablets in use and be able to see all visibility that can be plan for production. This can reserve a number that can be used to calculate how many extra bottles should be produce for a demographic area that current number of manufacturing can be made to cover new populations also.*

*The setup manufacturing system and strategic currently was enough for current bacopa. The manufacturing system continually feed the market where profit performance was seen in the product usage increasing since the first year introduced in the healthcare market.*

This can be seen that the manufacturing line were efficient to produce number of bottles to meet profit performance in manufacturer selling goods towards distributors and retailers, and at the same time distributor and retailer were also able to increase profit performance in the current market. For untapped market where bacopa extract were able to sell towards self-refer users and users whom listen to medical news from various source to use bacopa for their benefits, the manufacturer has efficiencies in production to cover these consumers in untapped market area also.

**Does your manufacturing operation capacity meet product market demand from retailer and distributor within short time and long term after? Could you explain its efficiencies?**

The manufacturing operation at the government manufacturing center was able to show operation efficiencies that met distributors' need, in order to make sale performance on their part. It can be observed below that machines can resolve number of bottles needed within short time and also provide long term commitment to long term users from distributors' sale towards retailers.

*The manufacturing operation can produce number of tablets exceeding the current market demand from retailer. At this time, it was also use to produce other*

tablets to reduce working time of employees, so it doesn't use much time during the day and doesn't not put more jobs on machinery that requires human use. This lessens the time for employees to work with care and function normally without haste for their function.

In a day-to-day job function, demand in market has been stable in long term users with new users begin to rise from last year, this may come from the demographic in each province that older people begin to age more and deteriorations in mental function has become more problematic that they resort to supplementary benefits. The time of a year passing is very short, in an interval of 6 months we have raise in number of users that we have to keep eye on raise number of users and machines station efficiencies in outputting the tablets to cover each raise in number of users per demographic. We also work with logistics to prevent disruptions from product reaching customer in that area, so it was a lot of functions.

The manufacturing line was able to prevent shortages from distributor orders since the time of bacopa extract was available. The manufacturing site was able to gain control of supply chain resilience in metropolis first then to suburban and far away provinces. The number of tablets in each bottle, has made a two months interval of time available for completion of next market demands and market penetration in each demographic region. With the machine available and each were still very new from metropolis manufacturing site moving to new site in suburban in addition to new machines, the operation capacity is more than efficient for current number of uses. With explanation earlier, on the BOI (Board of Investment) population ratios in age, if taken 14% upper age range from 45 to 55 years, 55-65 years were 13% , and more than 65 years were 13% , it would take 26 days to resolve the market needs with the bacopa manufacturing line alone, if all of these had to use bacopa extract from immediate-cause for their own benefits.

If a nearby station were to put into use for bacopa extract tablets, it would take less than 10 days. The tooling used in each machine were already provide by the machine manufacturer, so this was convenient for the manufacturing line to resolve any tablet shape planned for the strategic production planned. This can answer the short time in production efficiencies to reach market within 10 days of immediate-cause. Several raw material producers for tablet forming and bottle has been keeping

*in synchronize with numbers, the manufacturer has many partners that can provide efficiency in short time manufacturing to meet market demands. For example, the bottle shape and volume has been standard size available from many manufacturers, this enables short time production from calling reserved bottle from third party manufacturer warehouse, then produce new one within immediate time from call for more bottle manufacturing.*

*From the first time of production, there where increase in metropolis and suburban uses were in a raise, a single distributor calls for a larger number of bottles that were in a large demand, for distributing many bottles too far away provinces. During that time, many machines were put to work together in a normal 8-hour work day and was able to resolve within a little bit excess of 30 hours of normal day work. This was the standard timing for production, standardize check in manufactured pills, and bottling and packaging into warehouse and send to distributor through logistics. This can tell the efficiencies that it can reach distributor within time of demand, so the manufacturer can continue to gain market share continually.*

*All of the product were sold within a short time after the distributor's request, from that order fulfillment, there were continual amount in the same and increase amount that requires the use of machines continually in an everyday manner to efficiently produce the number needed for retail and distributor increase sale efficiencies and increase sale performances. The machines used were very efficient, along with scientific analytical equipment, we were able to resolve distributor demands within 2 days.*

*From this can be summarized that the machines used were very efficient in manufacturing that it doesn't affect employee's work time much, during their time. This also helps employee to work efficiently in a day because they also have enough rest, without having to work over time that can affect next day working performance in some people.*

*In a retailer that doesn't order directly from distributors, some also bought from government distribution channel also receives some attention by the manufacturing site and sometimes small manufacturing batch were made for clusters of retailers bought from government distributor channel. Within these numbers, was able to be complete with less than 1 day of time and were added to strategic*

manufacturing plan when next order may affect normal manufacturing time. This shows that the manager was very efficient and smart in strategic management of manufacturing operations.

**Was your manufacturing operation strategy sufficient enough to follow profit performance scheme from market plans, high demands, and consumer expansion? Please state your answer.**

As reviewed from interview with operation managers and marketing manager, the manufacturing machine and strategies were very efficient to follow production scheme that can follow marketing plans for successful marketing. It can produce tablets in mass production during high market demand and be able deliver products on time for profit performances in retailer and distributors.

*The current strategy that we have was very sufficient in creating profit performance when the machines were readily available in mass production for market penetration and market expansion. This also prevents of disruption of supply chain from market booming and logistic failures. Last year when there were increases in distributor demands with large single large demand and multiple orders from many retail sources, the manufacturing operation strategies were able to produce in mass production within required time to deliver all finished products to distributors and retailers. This gave a huge profit in a single quartile and with continuous product feed to long term users afterwards, profit performance can be seen in retailers, distributors, and the manufacturer. Although, it is to be acknowledge that with retailers and distributors mentioned, their retail strategy must also exhibit sales effectiveness along with increasing long-term users of bacopa and new users to try using bacopa. The success of bacopa selling market also depend on the effectiveness of sales in clerk and pharmacists.*

*With making new strategies in market plan to acquire new customer and expand market, the manufacturing operation is believed to be able to produce tablets in mass production in less time than the time required to market. Also, during high demands afterwards from successful marketing, the mass production can also be continued to work sufficiently for continuing supply chain sustainability to make profits.*

*The raw materials suppliers were also effective in delivery goods throughout the production phase that requires faster production to reach market demands, in the past years. So, in terms of production strategies, there were many talks during the meeting of all situations that can happen and how to solve it before problems appeared to begin. The government organization has worked with many third-party raw material suppliers in plastic bottles, bacopa powders, and excipients raw material. If more production needs appear, each supplier manufacturer would be contact for their availability in mass production of supplies.*

**Were customer orders from retail and distribution sector enables you to correctly forecast market demands from users and forecast raw materials to be purchase and sustain of supply chain? Please state your answer.**

The order that goes through the sale department in a weekly manner received order has been calculate with efficiency for issuing a manufacturing order sheet. The continual in manufacturing has been able to output a precise forecast raw materials needed for current production and future production. The raw material order and warehouse stocking were efficiently store and use, accordingly to orders from distributors and retail customers.

It can be seen from one of the managers that:

*It can be seen from the increase number of retail and distributor order, the warehouse manager had to increase number of bacopa extract standardized powder stocking up to 25% after last year after there was an increase in order that came from distributors, cluster of retailers, and normal sale by the governmental retailers. The forecast growth in sale was able to secure raw materials within time for manufacturing strategy and manufacturing line. There hasn't been overstocking of raw materials in the warehouse, continual use for production was seen, so it could be guaranteed that raw material freshness was seen in each standardize tablet, since extracted powder were used within the time less than a year.*

*The web synchronization of consumer and retailer was also a help in determining users in each demographic region and distributor's future needs to restock in each demographic region. The information from consumer intake were used by sale and marketing department for use with future use forecast and then use in*



*forecasting number of raw materials needed for production strategy that follows current sale and marketing strategy planned.*

Another manager added that:

*The use of web synchronization system provide visibility in daily product usage and able us to confidently use the information in securing raw materials for long term users. This provide the fact that when they continued it can directly confirm number to be manufactured in the near future, this help us to change raw material need in a before time manner so that there won't be a product stocking in a region that it was used. Even though the number in the study was small when compared to larger population that hasn't been exposed to information technology used, the ideation has visibility that can harbor future users for use with future raw materials securing.*

This can summarize that employees and managers were able to secure raw materials for current market needs and future market needs in long-term use manner of bacopa extract. The sustainability of supply chain is very strong in terms of management for resiliency.

### **Were your profit performance enables you to sustain supply chain in raw materials needed for future production?**

It was found that profit from bacopa extract result in very sustainable profit as consumer number begin to increase within each demographic region that has bacopa extract for sell. The profit performance increase in several distributors and retailers has given manufacturer a lot of capital for purchases of raw materials for future manufacturing purposes.

*The sales of bacopa extract have increase in long term consumer that enables profit performance to happen from selling efficiencies of many retailers and distributors. This has given the manufacturer a lot of money in profits that enables large amount of raw material purchases. The Royal Chakri also have raw material for purchases in the future that can be use by the government in the future, if future raw material procurement can be done. With the increase use bacopa extract, future plantation within the country may lower the manufacturing cost and benefit consumers.*



From the interview, there was an increase in bacopa extract uses from its effectiveness and the income shows profits that can be used for securing bacopa plant for in-manufacturing extraction that were incorporate into tablets after analytical standardization of extracts were done.

In marketing department view, there were purchases increase from quartile to quartile that remarks the importance of use in chronically ill, stressed, and age-deteriorated people, seen among retail pharmacies that were part of government.

**Was re-order from retail and distributor enables you to perform strategic production planning, warehousing, and distribution? Please state your answer.**

From interviewing with managers in production, warehouse, and logistic there has not been changes made during the time of interview, although the future of production would be in the suburb of Bangkok, from there on the logistic and warehousing would be a little bit different from the routes they take for delivering goods to customer and warehousing would be larger to accommodate changes in certain policy.

From the production manager, it was seen that orders from distributor were usually large orders when it comes to manufacturing these were mainly large business that provide smaller retailers to pick up the goods when they have customers among smaller cities. There's also another cluster retailers that usually order very large number if the product have a lot of consumers within the area. Also, the retail pharmacy cluster that the government owns also have large orders continually from retailers. Summing all channels of customer have diverse background in activity and location of goods selling. With the diverse background, the manufacturer also has strategic production for each type of customer apart from government retail cluster.

As mentioned by the production manager:

*The number of re-orders were getting larger every time from last year, the strategy remains the same because the number of machines were available for production, although number machines in use may be increase during the time that has high production for the distributor. From lot to lot, the number on the bottle can be trace back to which lot belongs to what distributor ordered for the manufacturing.*

*The same was for the small cluster retailers that weren't government retail store within the metropolis area.*

*It wasn't a heavy job in manufacturing for distributors, handling multiple distributors order also wasn't much a hard job because the machines were readily available for manufacturing and there were enough people on their daily role in production.*

Another manager added:

*With the warehousing, the warehouse used is in metropolis. It is very large and was built to handle manufacturing drugs for countrywide purposes. The area is very wide and have large compartment for storing finished bacopa product until release. The logistic system hasn't change much for the sending of products to distributor and retail customer for metropolis and far away provinces. Although some specific route that can use the highway that requires payment at entrance would make it to some distributor faster and easier during work days. This eliminates traffic jams better, also some of the third-party logistics can pick up the goods easier at the new warehouse site in suburban area.*

In summary, the strategy for manufacturing would be the same throughout but at larger facility, it can handle more production throughput and larger warehousing can accommodate countrywide production that can also provide more drugs for country within the ASEAN group.

**Was re-order from retail and distributor enables to perform more efficiencies in operation that save costs, time, machine, human resource, and money? Please provide answers.**

From the interview, it was found that re-order from many sources have made machines operate more than before in numbers. All machines perform very efficiently on all orders, and they were used in group manner to get jobs done on time. In terms of save cost, the machines were set to run to finish tablets required in time, this was seen as save cost for time and doesn't make employees at packaging station tired at the end of the day when operating on packaging machine that were semi-automatic.

Operation manager gave a brief point that:

*Manufacturing operations were complete daily, if orders were large the machines would run in numerous numbers according to stations needed. There's a distribution in number of tablets to be made in each number of machine available per day. Mostly, it doesn't require all of machines running. The machines were all automatic, it requires watching from time to time but not constantly, so it doesn't require much employee. Every manufacturing saves a lot of time, so the employees would not be tired from daily jobs, this doesn't cost fatigue and work associated stress. Running the operations in a day-time work doesn't save cost on electricity used and policy on the employee's payroll stays the same, so it is a fixed payment kind of thing. However, when compared to the number of growing customer and long-term use, the profit-making in this is higher than the initial investment made into resources.*

*The retail order was scheduled by the retail-end. They usually re-order when their stock is going to be low or need warehouse shelving when smaller retail cluster needs their shelves to be refill. In a synchronization process communications were done between retail and distributor, so there's never a shortage between retail stores involved in planned synchronization. Also, many retailers were aware that new dosage form of the bacopa have more market potential and tends to stock more when many users begin to use continuously for many months to come.*

Another engineer added:

*In terms of overall efficiencies, the re-stock order didn't change any fixed cost on the expenditures but it tests efficiencies of machinery that can solve very large order in little time from the fact that machines were thoroughly used from a group of machines to another group. Using all machines but separately by lot, helps prevent machine fault that can happen when constant checking can be done. Also, the lubricants on stations doesn't dry out from being unused and lubricants applied after each lot produced also protect metal layers from deformities that can happen throughout its usage life. With all these in mind, the machines are constantly in work and check all the time and it is a way of prevent disruption that can happen in manufacturing operation, such as very large order at once that takes many days to complete. Also, the technicians knows when the machine sound isn't right, something needs to be check and this solves many failures that can happen.*

This can be summarized that the production line doesn't lower any fixed cost but all production cost in hiring was not increase. Although, when a time that needs an increase in production that requires more overtime. This can lead to safe-cost when machines were ready for the production. The number of machines is usually more than human supervising the machines, so it would be a great safe-cost during the longer work shift. It can be also be concluded that the number of machines working in a rotating lot production manner, can help prevent machine failure disruption in the future. These were some strategies that the manufacturer used to prevent disruptions in manufacturing operations.

**Does your production manager have pre-plans to prevent disruption prior or while producing items to be delivered in order to secure product supply chain to customer? Please provide answers.**

In a statement below, was interviewed with head operation manager and was found that they collaborate together more in a synchronization way that the web system was integrated into their monthly routine, apart from major distributors and retailer groups. This helps them in many ways in preparing pre-plans for each quartile and operations management in many departments.

*Most plans to secure order and delivery on time were done by sales and marketing department working together to secure supply chain. When the orders come to us, there were mention time to get things done on time and all were done on time, without failures on machine or people in manufacturing line.*

*There were all types of plans for preventing disruption within the manufacturing site. Fire evacuation plan, machine failure plan, storage failure plan, and manufacturing plan. Although the machines were check before use and after use, this helps prevent machine failure for more than 8 years in some machine. Engineers frequently checking on the machines working environment, conditions involved inside the building, applying metal components lubricants, and checking metal parts for faulty points were done within schedule time for check-ups.*

*During the machine working, it was production pharmacist job function to check the machines frequently in the semi-finished product drum, machine rotary station, and the powder hopper. Vacuum dusting of unwanted powder was also check*

*for every station, so this prevents the deformity in finished tablets. These steps were all checked during production to conform with quality and standards involved in manufacturing operations. This gives quality to every tablet produced in a semi-finished product. The production conforms similar standards in PIC/S and Good Manufacturing Practice Standards that were seen in all pharmaceuticals.*

From the interview, gives very strong background in management for the manager. It was seen that the manager can routinely detect faults before it happens in operations and certain talks during meeting has also help make pre-plans for each operation and incorporating new visibilities such as web system was seen as crucial part of system, that if many customers accept the new functions more in the future, it would become part of pre-plans for newer management system to be adapt into the current system.

**Was your warehouse manager able to distribute goods efficiently when retailer and distributor re-order extensively and were conventional management effective in carrying out operations? Please provide answer.**

In conventional system the warehouse and logistic works fine and have no problems with delivering large volume of order. Although, there were some difficulties in metropolis traffic when delivering all of the supplement to multiple sites.

*It seems that in current operations, the warehouse was able to distribute goods efficiently when the drivers were proficient in small pave way between buildings, streets, and highways to metropolis suburban. With the synchronization applied, it makes more logistic and warehouse aware of their functions more with the visibility given from the web system. This also add to their proficiency in delivering goods. When deliver extensively, it makes them more efficient in time management, such as which location to go first and last for minimizing fuel use and time usage before returning to the warehouse for another delivery to another site. The listening to traffic radio also helps them in several ways to manage their own logistic jobs.*

*The synchronization method has given them more opportunity to talk with cluster retailer within the metropolitan and distributors. This provides them more carefulness on the delivery than just delivering multiple types of pharmaceuticals to*



*certain destination. It gives them information that they are delivering a special goods to special people whom distributes large quantities of bacopa. This gives them awareness that they need to be more cautious with their delivery because it is a single larger lot than smaller 2-3 batches of pharmaceuticals to distributors. Also, route to distributors were also chosen in a less traffic hours or days.*

*In terms of delivering goods on time, at the current site the logistic had limited number of trucks and vans for use. If a lot of delivery had to be delivered on time, usually a private logistic may be hired for use to prevent disruptions from our own logistic not returning on time to make the multiple rounds when traffic gets jam. The extensive re-order was medium in volume, the logistic department was able to continuously able to deliver goods on time. There was also a large volume once when the distributor had to stock a big amount to secure their supply chain and logistic had to make multiple rounds of delivery per day to multiple warehouses site within metropolis.*

*In a way, the logistics would be more effective when the manufacturing site move to suburban area where there is more warehouse space, more lift fork to accommodate warehouses, and logistic transportations for delivery into suburban, far away province, and metropolis. The metropolis route would have faster lane from the super highway that charges a bit sum of money.*

With the web synchronization mentioned, it can be seen that logistic were more cautious in delivering goods because they were more alert with the safety and disruptions when it comes to delivering high amount of goods to distributors.

**Were fulfillment or re-order for stocking from retailer and distributor efficient enough to help manufacturer warehouse saves budget on its logistic strategies and operational costs? Please state answer.**

It was found from the interview with warehouse managers and logistic managers that cost saving in operations were efficient in midsize manufacturing and faster logistic scheduling with retailer and distributor can minimize expenditures on electricity consumption for finished product storage before delivery next day.



Synchronization with retailer and distributor have efficiency in acquiring delivery time that affect warehouse expenses on electricity in smaller warehouse space.

*The warehouse is similar in many industries, having more than 2 rooms in a facility that is one room for raw materials, and one room for semi-finished and finished products. Although, larger warehouse can accommodate single semi-finished and finished product room. The warehouse has standard light system and air-conditioned system. Although, it was kept running all the time, so it is a fixed cost. Cost minimization was done through clearing finished product out very fast through logistic cooperations with retailer and distributors. This helps reduce electricity when less storage requires less electricity consumption for the air-conditioning system.*

*With the logistic, it has occurred yet with the logistic that requires very large volume to be distribute out of the warehouse. Although, with larger volumes seen in pharmaceuticals distribution, sometimes third party logistic were also hired so government can help business that can grow with operations, so this can make logistic more resilience when certain type of disruptions can happen along the way throughout the years in business. The third party does help with saving with operation cost for long term and prevent logistic disruption. This prevents hidden cost that may rise from maintenance cost of transportation and repairs.*

*With the re-order for stocking when with current system, it can be seen that the warehouse manager uses the warehouse efficiently after receiving the exact amount from production manager. They work with logistic manager to have the goods delivered next day in order to save electricity on the finished product. The midsize in volume manufacturing enable the warehouse manager to quickly manage space in rooms to accommodate finished product to be deliver by logistic on the fastest date and time. This is similar to many manufacturers in order to save expenditures on electricity consumption.*

Everyday logistic function leads to two types of saving cost after synchronization with the current system. The goods were matched in amount that were in retailer and distributor warehouse, this led to better approximation when it comes to calculation for gasoline amount and traffic route used. It also led to logistic having to stock minimal oil for transport trucks and van. This saves logistic operation cost when oil prices go up.

It can be seen from many statements above that multiple midsize manufacturing leads to save cost in warehouse operation and logistic operations. The save cost seems to be better when midsize volume doesn't require much electricity on the storage condition and storage time prior logistic transport to purchaser those were cluster retailers and distributors. It can also be seen that cost minimization were done in-between operation process, what can be done in a smaller manner that utilizes less energy than previous operations.

**With conventional management, were your production line capable of withstanding high-volume throughput in high market demand situation? Please explain.**

In conventional management production line, it was able to complete productions according to market needs and machineries were able to be used in a rotation round of production, where every machine was able to be use in production once in a week, so it is constantly used and check for efficiency and repair if any. Below can be summarize by the operation manager at site:

*We were able to withstand high volume throughput in the first two years of rising market demand and proven to be useful in the high-volume order in the past transaction. Manufacturing to reach market demand was quite successful for the non-extract and extracted tablets. With the extracted powder tablet form was easier to produce and flowability was easier on the hopper due to better size comminution.*

*Manufacturing capacity per day were exceeding the market demand and prepared for larger volume manufacturing when in need. Within few months the whole facility will be move to suburban site that will be equip with a greater number of machines that withstand very large volume manufacturing of bacopa and other supplements. The current profits in supplement market has increase profit in the performance region that can sustain income for increase size and manufacturing capacity that can sustain business resilienceness in manufacturing and furthermore it is believed that suburban routes can lead to faster delivery to far away provinces and faster routes to many distributors that were along the super highway that can reduce*

*timing, although there were costs that were minimal in expense per round-trip into metropolis.*

From the interview it can be conclude that the system is operable for large volume when needed during any market situation. The supply chain when synchronized with current system also help in the formulating strategy for production that can reduce operation cost in a way that saves money through the most efficient timing that were planned with warehouse and logistics.

**Were your warehouse and logistic operation had efficiencies and performance that matches current market demand and tomorrow's market demand?**

The current warehouse is already good with the compliance to world standard for manufacturing of pharmaceuticals. This is the standard that was used when keeping the supplements. It is efficient in keeping quality that meets manufacturing standards. Although the size of current warehouse is also limited by the building size. The room size, aeration, humidity, and temperature conform the standards for keeping finished product in good condition. Also, the supplements that went out were in modern air-conditioned trucks and vans that meets pharmaceutical logistic requirements that was world standard. With the rising of demands and increase production for the people in Thailand. The manufacturing site in suburban and warehouse would serve as better in manufacturing capacity and warehouse size that meets very large market size. This would answer the ability to tap the untapped market that is 97% in size of supplement market. If comprehensions on logistic efficiencies and performance, the new manufacturing site would serve the numbers needed and better routes. This means that transportation by land and air would be very quick for delivering products. With this comprehension in mind, the logistic would be a little bit faster than before if bacopa extract product needs to be sent to far away province or nearby country in a fast consumable market state or in a product booming time. During this time, it was buy-and-try and many people found it very effective so they continue to use for longer time. The effectiveness and safety were studied in a period more than 1 year, so this was also taken into account that manufacturing operation must be able to sustain supply chain to retail stores in very efficient way and in best route in logistics.

**Was your purchase manager able to secure raw materials in time and budget-save with conventional method of management and marketing?**

With many steps in production, in the strategic planning there were many important steps in the management that were able to sustain supply chain management from the start of the project for the manufacturing and distribution of bacopa extracts. It seems that the resilienceness of raw materials stock that were for bacopa product that were first item product produced in many years which was the non-extract version. The powders that were non-extract were also put into use for the production that contributes to producing large volume during last year.

*At the current time, purchase manager was able to secure raw materials in time according to market plan and production. During last year, where there was a large volume production, the purchase manager was able to acquire large number of raw materials in low price and constant purchase has been able to store many raw bacopa for extraction before incorporating into powder for manufacturing tablets. The bacopa raw material was seen as budget saving already, there were many raw material distributors that the purchase manager can obtain raw materials from. Also, sorting and standardizing raw materials were also a crucial process. The extract raw material was constantly transfer into raw material warehouse to wait for production. The supplement like bacopa that was used for long term were taken care of differently than other supplement raw materials that it needs to be available at all time. The large volume order last year also one of the challenges that prove the extraction plant was also effective in providing correct and continuous raw material amount for large order quantities from the cluster retail and distributors.*

*Raw materials were inexpensive with the bacopa plant so continuous amount can be purchased directly from the raw material distributor, also with known distributor in many years business possess a high yield bacosides results, so it is quite less problem with extraction plant and manufacturing operation is also smooth without problems.*

When market was overseen by the marketing manager, there were various consumer that uses the non-extract and extract version of bacopa product. The raw

material used to produce were the same, however the other one was extracted before and processed into dried powder for mixing and tableted. The bacopa powder with the non-extract version received many attentions and wide range of consumer. It was safe to use continuously for long term and can be used for many years. With the stocking of dried powder for non-extract version, there were raw materials already available for making bacopa extract for the dry powder. This serves as another immediate reserve for production of bacopa extract tablet when need for immediate production, such as during time of market booming, fast consumable. From this point, it can be seen that strategic marketing plan and manufacturing planning can be seen.

So, this can be concluded that the conventional were already effective for manufacturing that can supply continuous product for marketing. Also, the raw material was also doubled by the market size for both product and raw materials for non-extract can be use for extract products if there's any disruption in the future for the market boom or require of immediate use in case of helping neurological symptoms from newer strain of covid infections.

**Does your product marketing efficiently produce order from retailer and distributor to efficiently improve manufacturing production that leads to performance in profiting and budget saving incongruence with efficiencies in raw material procurement and supply chain sustainability? Please state your answer.**

It was answered in short that efficiencies in business management were able to produce orders from distributors in a timely manner that sizes of manufacturing process can be minimize to midsize manufacturing that saves costs during day and doesn't make employees tired. The raw materials for the production were very cheap, right now there were more than enough for the manufacturing of both bacopa supplements. There were times that two reserves have help each other in times of quick manufacturing for large volumes. With the profit from the delivered goods was able to purchase more bacopa powder raw materials for sustainable supply chain. It can be summarized in a short interview below.

*The marketing team over the years have increase order from distributor from time to time and this increases the manufacturing production that leads to*



*performance in profit gains while its midsize manufacturing also leads to savings in manufacturing expenses. Together with the efficient in re-ordering of raw materials also lead to more savings when order in larger volume for two raw material warehouses. This leads to supply chain sustainability when two warehouses act as reserves for one another when there's a shift in former users and newer users of bacopa.*

*Large volumes sales, enable more profits to buy for bacopa raw material powder, with the selling of bacopa extract, more income was made. This leads to purchasing more bacopa materials for stocking at raw material warehouses. Right now, the manufacturing was quite stable with the production that sustain supply chain at a level that produces profit performance for the retail sectors. Uses of bacopa were from medical news, chronic conditions, and stresses increases with the demographic population age that number of old people seems to increase every year and lower birth also results, similar to developed Asian countries. In the first quartile of this year, the sustain profit was increase about 1.14% from last year for the bacopa extracts.*

*Sometimes changes can be seen sometime during distributors that sells two types of bacopa to their customer retail stores. It might be from that their conditions subsides from stress and they want to take smaller dose that were non-extract form. This was seen sometimes with the distributors and retailers that have been a long customer of government manufacturer.*

*It can be seen from consumer number has risen from the over the years, this summarizes the increasing consumer size that helps in profit performance that drives the manufacturer to stock more raw materials for supply chain resilienceness. The continuation in planned strategic has led to minimization in operation cost that also leads to more money for securing raw materials for future production.*

**With conventional management, were you able to forecast manufacturing operation effectively, market demand, and purchasing right amount of supply to sustain production, thus giving supply chain sustainability?**

*From the interview, the current system seemed to work very well and can continue to function to sustain supply chain. It was very professional for each*



individual in their function to maintain operations and solve problems that may arise from higher demand.

*With the current system, management with statistics for business management were able to sustain supply chain from year to year. The market doesn't grow very fast but in a continual manner that enables workers to work without rush. However, there were some times that there were rushes when the distributor has gained a lot of smaller retailer customer that were interested in new product, such as bacopa extract or the GPO Selext. Thailand is a small country that has growing number of geriatrics, that our product is crucial to their deteriorating health at some point in their life. This was a type of awareness that you get and it prompts you to check and check again. Also, it might come from the fact that opinions within friends also spread rumors about product that were effective, among these criteria can cause an increase in users during short time, also with the media reporting news.*

*The growth number of users can be acquired from small retailers, clusters, franchise, and distributors. You can see it on the demographic chart in meetings that the value goes up in certain regions, every one sitting at the table would know their jobs and would give opinions with statistics on what to do, what can be done, and how to solve problem that can arise with the rising numbers. The conventional management were able to effectively forecast numbers need to produce to sufficient the distributor; it demands forecast effectively to give a number to be produce. It gives a right number of tablets that must be produce and how many can be produced in a given time. From this point, raw materials and production materials to be purchase can be derived from the forecast. Although, there were some points that stocks must be add in advance up to 10% at times to secure disruption, since the raw materials were inexpensive.*

*Many deep market studies were also done to be aware of gaining and losing consumers, not from competitors, but from themselves. Sometimes, consumer have developed some type of conditions that bacopa may not be beneficial for use in high amount or any amount was another factor that can affect market size and demand in a demographic region. While sometimes later, when they don't have the conditions, bacopa can be use again. It is certainly depending on retail pharmacist to carefully*

*workout the safety and use in patients, was another criterion that affects the whole retail and manufacturing business.*

From this, many factors affecting sustainability of business operations can be seen in conventional management that were already practiced in the organization. It can be seen that the organization is a research organization, a pioneer in product development, and a strong market leader in product and services.

**With information given through conventional management, were you able to forecast sales similar to retailers and distributors?**

From the interview, two points on sale forecast can be made:

*With the current management, forecast sales gives numbers relative to distributors that we customer for many years, with the new retailer it is quite easy and quite hard at the same time, when increasing number of sale and increasing customer requires time. Also, the non-extract bacopa has 2-3 competitors, and most Thai people doesn't mind. Every brand has quality and effectiveness because bacopa is effective. 2-3 product availability on-shelf is very hard to compete when customer can choose any. If the product sales begin to increase after receiving consumer satisfaction that the product is effective, small numbers would begin to rise and forecast can be made afterwards. This may take 3-6 months to see any movement in product sales. Also, there were some retails that buys the product because other retail has the same product also. This is hard to forecast if the product will sell in long term or not, but it is noticeable when usually these retailer purchase in small amounts. However, there were also times when small retailer bought in small number and their customer number grew larger and larger. It is all up to population's condition in a demographic region and also some marketing tactics in retailer on how they will sell the bacopa products. So, it can be said that everything takes time, and certain talks can be done with new retailer to analyse their difficulties.*

*This can be summarized that with the conventional system and statistics in management, the forecast in numbers were congruence with each other in retail, distributor, and manufacturer. While new retailer, it depends on how they manage new products that reached their store and warehouse. Also, their activeness contributes to*

*sell efficiency to make a profit. This depends on the clerk and pharmacist also on how active they were during the work shifts.*

*Situations like this happens in many retail settings that have not been in long business within an area. Usually, there were new openings and closing, due to the fact that new pharmacist graduates yearly. Sometimes, many bottles were bought but hardly sold was another problem, depending on consumer conditions that hasn't been reached to a point that bacopa is needed for their health. So, this is quite hard to give opinions on the topic.*

With the conventional system, the new retailer was quite hard to predict on sales until a continuous point increase in sale can be seen, which may take around 6 months to see progress. Usually, when the new retailer can make a continuous sale, this means that consumers would be likely to benefit from GPO bacopa in long term, in a demographic region.

From the interview with sale department, there were two points can be made, the new retailer was hard to forecast sale in the first 3-6 months because there was newly startup retail all the time that happens every year. When the product re-order doesn't happen, eventually it usually means the new retail may be close within the next year. This was usually seen with new pharmacist whom were unemployed and would like to make money so they invest in new store. In Thailand, it was not hard to open a store if there's license and minimum investment of at least 300,000 baht for a good amount of drugs. Sometimes, when the store doesn't present a good amount of income, pharmacist may apply for a job elsewhere. In the continuable drugstore, chances of retaining self-own drug store may be from sustainable income or pharmacist had a job at government offices and they can still run their pharmacies after work. These were the two cases that was found in normal drugstore business.

**Do you feel the need for further management adding to current management that you are managing?**

This was opinion received from the head managers:

*At the present time there were no management to be made to the current management because it was the same every year after the meeting, however with the web-synchronization was interesting project to be studied, so the thesis was seen as a*

*crucial study similar to other research that has been done by the government for business operations each year.*

*The project was applied and had a good result on workers' opinions and actionable process that can be add into the conventional system in the future. There were also important talks on how government organization can function better in team work, there were also KPI performance tracking and record functions. Key management point performance and effectiveness testing were also present. There were also rewards were given to individuals who perform well within the organization. From this, there was less available time for any functions to be added crucially because it would affect the efficiency and quality of work of employees. Also, with the quality of work and current earnings was satisfactory for the organization for the former and current year.*

The operation management within manufacturing sector have meetings each quartile and there were also smaller immediate meetings to steer directions when more action is needed apart from important meetings. Timing was significant in any changes in operations after meetings and current operations also used available time already and more functions would affect the quality of work in progress of the organization, for obtaining goal set in each quartile.

However, with the research in web-synchronization for consumer behavior, retailer operation, and manufacturing operations had important points to be discussed for incorporating additional visibility into the conventional system. It was accepted as pioneer research in feasibility of additional actions that can enhance organization effectiveness, improve performance, profitability from saving, and investing of available organization's capitol to improve organization's supply chain sustainability.

**How do you feel about current management on its efficiencies in production, marketing, warehousing and distribution?**

From the findings, it was similar to answer in former questions but the reason was that nothing can be change because it was agreeable by many participants in meetings and it was the best way that there was no alternative choice for the time, management, and other organization involve in administration of government pharmaceutical organization. This can be seen that there were other management that

also controls how government pharmaceutical organization act in its role, management, and caring for country's people healthcare.

*The current management has efficiencies that meet market demand of today and tomorrow. The only factor was conditions of people in each demographic region that fits the need of product use. Marketing was crucial in letting people know how bacopa can help their condition when it arises or when it stays, how can it lessen conditions in long term. The current manage on marketing was very good in past years as profits were continue to grow and with the extracted bacopa version, the sale has increase to a desirable point. The working of warehousing and logistic were also effective in delivering the products on time to small retailers, franchises, clustered retailers and distributors. There were no problems in transport trucks, vans, and large trucks. The only problem that can be seen from year to year were street repairs and traffic jams. The distribution system apart from logistic also have efficiencies in information system and personnel management. They were able to perform quick work in talking to customer to manage manufacturing and delivering time. All functions were done effectively, this was in a multi-setting sale usually talk to customer first and deliver products later at the effective time for manufacturer and retailer. The system that we have were already in a good set and flexible around the clock for very large production that can cover pandemic help within less than a month time if there were special needs for bacopa and its extract. As you can see the Thai government were able to control COVID-19 spread effectively, all of the management from Ministry of Health and government pharmaceutical organization were also able to perform to conform the actions of government decisions in taking care of people's health.*

From the interview it can be summarize as similar to former questions that were answered, this is because it comes from agreeable point of management that it can solve problem effectively for the organization and can be trace back to evaluate performances and effectiveness.

**How well does synchronization performs in production operation efficiencies that enables manufacturer to meet high demand throughput in order to achieve**



**profit performance in current market and untapped market beyond? Please state.**

From the interview, web system synchronization gives visibility on tablets in use, current unused, number of bottles, current users, continue users, and new users. This gives short term and long-term visibility on how much to be produce within quartile and approximation of numbers need to be produce for the whole year in regards to increasing consumer every quartile. It was very effective that it can handle manufacturing for numbers needed for every distributor and retailer that were making profit performance when numbers of users in each demographic is increasing as well as low-price promotion have increased sale in current customer purchased. It can be seen that it prevents product shortage and shifting cost for the current market situation.

While it helps manufacturing performance to fit manufacturing tablets for customer's profit performance, it also helps managers performs very well when workers have visibility of long-term continuing users of bacopa extract. It gives more confident in manufacturing that a group of current consumers will continue using. There has been increasing rate of conditions and illnesses with the number of increasing retired population, this shows increasing sale of bacopa in some demographic regions that has product and advertisements. Also, with increasing rate of conditions from other market research studies, there seems to be a lot of untapped marketable area that bacopa and bacopa extract can be reformulate to help consumer health.

Below can be a short message from the manager that:

*The web synchronization helps the conventional management in many departments by working together and solve everyday problems that were existing and future problem that may arise can be prompt through visibility shared between workers. The web system when corporate into the conventional system, were able to create an awareness on power saving and management for power saving in addition to fast production and logistic to save cost on warehousing. The forecast was made with accuracy and better distribution were resulted in better retail shelving and warehousing small retailers. The distributor also has better income that showed profit performance with a decrease interval for continuous re-order. This had made an*



*increase in manufacturing size and machine used in the manufacturing site and mid-size production were seen continuously with the re-order, in a way that saves electricity when very fast production was run with high number of station machines. In the present time with an increase number of user in demographic region were a way that leading to the need in high performance production in the future. However, there weren't any concerns in the machinery effectiveness in delivering high through put of tablets because all of the machines were capable of producing more than half a million within 8 hours, for the lowest specification machine running normal speed production on the turrets.*

*Web synchronization also help in a way of visibility that how many tablets were use for which type of condition. It also helps market department to tap into current illnesses in the society that many different types of formulations can be made. With this, the production development worker can formulate for raw materials used for production and did variation of tests for feasible commerce ability and reproducibility. With the market beyond, it can be look in to the past that we have warehouse for each type of bacopa product, the extracted and non-extracted. This is the one of the ways that secure the production if one of them stagger in raw material amount for production. This means that the warehouse for each can replace for each other within a time of less than a week, before new raw material can be added to warehouse. So, the manufacturing was very secure in supply chain resilienceness. Also, with the very large storage of raw materials were able to compensate for each other when bacopa can be use in other formulations that fits future customer that bacopa can help. When bacopa is used as additional ingredient to other formulations, the reserve can be used for supply chain sustainability, when entering untapped market area, or the area of personalized formulations and varied formulation for illnesses that requires bacopa with other ingredient treat multiple condition.*

This can be seen that incorporating the web system from consumer directly help retailer in helping consumer and help manufacturer to forecast how much tablet will be need to sustain long term adherence in consumer. Also, any further changes in web input within web synchronization in the future can give rise to bacopa formulation for untapped market that were around 97% from Siam Commercial Bank market research studies. This can be seen that it is very important to incorporate

information technology use into business organization to give visibility in business operations and market research that create benefits for consumer health, or suitable indication of use for particular illnesses. The manufacturing efficiencies and performances of machines were already proven for resilienceness, the machines that were not used for alternating days can be use for new formulations production for untapped market any time when market launches, also the new facility in suburban can be increased in machine numbers when new formulations are produced for the untapped market. All of these mentioned, it can be seen that the manufacturing machines is also effective in producing new formulations with two current formulations of bacopa. Moreover, the web synchronization can also help new formulation users similar to bacopa extract users and help in manufacturing operations in terms of visibility for supply chain sustainability.

**Does synchronizing manufacturing operation capacity to retailers and distributors met product market demand within short time and long term after?**

At the opening of the question, the manager mentioned the efficiencies of machine production capabilities that can already accommodate market demand in short booming period and long-term use after the period. Although, market booming hasn't begun in multiple large amounts but the efficiencies of machines of producing a bit less than a million bottle per day has the capability to withstand product shortages within short time.

*The time prior synchronization, it has been explained already that the manufacturing capabilities were capable of manufacturing in large volumes and in numbers up to accommodate market booming operations and pandemic control, similar in cases of andrographolides extract for pandemic illnesses. Also, at a large volume stock up for distributor last year, the manufacturing had finished within less than a week time including logistics. After that period, all operations for continuation of re-stocking distributor warehouses were synchronize within the study and have met the product market demand in numbers for the extract bacopa users. Also, if there's another or multiple large volumes in demand for bacopa extract for conditions similar to andrographolides use to help with COVID-19 infections or vaccine conditions related to COVID-19 use, when bacopa can help. The manufacturer can*

*also produce the numbers in need for the mass population usage. Also, within the two-months' time, the raw materials warehouse will be able to sustain supply chain for the retail and distributors. At the current time, there were continual repurchases to refill raw materials in stock for the warehouses.*

*So, this can explain that manufacturing operations can handle large volume market production and sustain supply chain afterwards. Also, the synchronization of web system can help determining numbers to produce and forecast with confidence of total number to be produce to fit number of current users, long term user, and new users. If in the future, the web synchronization is applied to the organization, it would help the organization to see almost all of users and be able to comprehend consumer from data involved in web synchronization and other data from other research sources.*

When interviewed more about “*Also, does your manufacturing capacity meet future market demand for product booming that may cause shortages in market supply? Could you explain your manufacturing efficiencies with synchronization?*”. The manager replied with confident that:

*The manufacturing capacity exceeds more than 800,000 bottles per day for newer machines installed is ready for prevention of shortages in market supply. This is the number at the maximum without help from other manufacturing line. The efficiency of machines can be link to web synchronization when a person responsible for visioning the number of users came up to total number to be produced, then report to manufacturing operation manager to prompt for re-order from distributors for additional information on manufacturing lines. The operation manager then prepares machine for use with each batch of production and extra batch to secure supply chain sustainability. The forecast on the retailer, distributor, and increasing number of users each quartile to each year works very reliable. The re-stocking of raw materials for extracts also conforms the forecast from marketing and sale managers, to fit market size and accommodate future market growth.*

So, this give information that the future manufacturing operation and market securing process is likely to be one of the leaders in supplement market. The very

strong work in team and collaboration with synchronization has led to a better team efficiency and better performance in role functions in every department involved.

**Was web-based visibility providing information sufficed for creating manufacturing operation strategy sufficient enough to create profit performance from market plans, high demands, and consumer expansion? Please state your answer.**

With the visibility from web synchronization, the profit performance can be seen in all retail sectors, as data reviewed came from continuous re-order from small independent retailers, franchises, small retail clusters, and distributors. Manufacturing with midsize batches were making continuous sales in distributors within metropolitans. The visibility from consumer input can enable planning between retail and manufacturing of how to take care of customer, review current customer in each demographic region, and also taking care of each individual in long term use. Any continuation from customer would be known for at least 2 weeks to 1 month when the input in web system or verbal communication with pharmacist would conform continuation use. This gives confident with the number forecast and re-forecast if there's any growth in market size. This gives information in a very interesting way of how visibility can help steer organization into a better goal in mass consumer healthcare.

*Web synchronization help with the forecasting in small retailer in each demographic area that has bacopa extract users. At this point the visibility is good, our talks with distributor have led to conclusion that it also eases the number of orders in the future when it can be readily read from the web system and reviewing with older information from conventional system. The distributor can be advised to order more with help from information we have at hand on the visibility and certain discounts can be given to non-government distributors to help them make profits and sustain profit performance so they can order more in the future. This helps in a lot of things as profit performance can be used to apply for financial services to help business growth. It is a win-win type of thing for distributor and manufacture relationship in business. With the visibility in consumer use, an incremental change in*

*amount to be ordered and severity of user's condition can help predict how many to stock at distribution center with good confident and judgement from distributors. Although, in a larger number of users would make wider visibility that can help us predict number of new users and continued users, better in a demographic region that receives wide consumer attention.*

*All of mentioned where the functions perform by sale and marketing department that works plan for customers in private retail sector and government's owned retailer. When the made plans reaches the production, strategies for each batch production are made and report of all materials usage were recorded. From this usually, one of the workers would review materials and report to purchase managers for raw materials refill re-stocking. Another report to market and sales manager that production is on its way for tomorrow or next day logistics. From that point, the sale manager would affirm with its customer that logistics will be on their way to deliver goods to customer. All job functions complete would be report to headquarter for further assessment in efficiencies and performances. Sales department would have to report their KPI and so on. All of these were most of all operations in a big picture that government organization strive for its best to stay competitive in the health consumer market. The manufacturing site is efficient already, things that matter most were consumer and customer relationship that were important in business operation and web synchronization visibility help us to see the mini process in consumer consumption that tell retail sector when product can be sell and how to stock it for adherence. In the future, if most consumer were able to use web system, it would benefit very much in forecast sale and forecast manufacturing numbers to fit market needs. This would bear information in the future for an available number of raw materials for new product formulation for untapped market.*

After the interview, the manager points several improvements that can be made into the web page system that it can accommodate more data input for total conditions, however in terms of daily feelings. This information can be use for formulating general health promoting pills that can be made and made profits from untapped market. The untapped market may be in the form of personalized supplement medicine, other indications of use, and new found uses. All of this were potential for helping customers in their illnesses. It also helps other partner in business



also to sustain their income and sustain raw material for the manufacturer. From all of this will help the economy and life for farmers within the country, all of these can help people of the King Vajiralongkorn and Royal Princess Sirindhorn, along with Royal Thai Monarchy's royal projects in the future.

**Was synchronization data from web-based enables you to correctly forecast market demands from product users, retailers, and distributors and using it to forecast raw materials to be purchase, then sustain of supply chain? Please state your answer.**

From the interview, the web user system helps manager to directly know the number of bottles to be produced from a confident point that user will continue to use for long term adherence.

*Synchronize web user data gives number to be use in the future in the project studied, it also tells the location of users and we were able to see numbers of users in a demographic area, where it is used. When reviewing information, we can see that it came from which distributor or customer of distributor and able to review the information with demographic study. From this at hand, we were able to forecast market growth within the region, when health conditions will eventually have deteriorations at some point and increase in mental deteriorations may cause geriatric people to get bacopa product through medical news, talk with pharmacists, self-refer, or friends and family advices. Also, work stress was one of the causes for using bacopa extract when the level of severity prompts for extract version that helps the physical and mental better. It shows within the demographic data that users were among engineers, construction worker, industrial worker, repairs and maintenance services, and management people among government and non-government organizations. Although, this project has a good number of people presented for seeing significance in effectiveness in operations and forecasts, if in the future the system is applied to wide consumer range, it would give a better confident number for the future manufacturing. From this, the overall raw materials needed for the future consumption can be made to calculate production size and raw material needed to store for current and future productions. Also, future product and services that untaps*



*the 97% untapped market would be able to reach consumer whom uses the web system.*

*In all above mentioned, product user numbers were obtained from web system with the continuing and non-continuing decision can derive a minimal number that retail store must store for adherence, this gives rises to easy number that small retailer can use for shelf stocking and warehouse stocking. Also, distributors can forecast and stock an efficiently for smaller retailer when they need to refill their warehouses. A number of growing new bacopa use can be for reviewing consumer data with retailer and distributor for suggested retail warehouse stocking. With all conversation and orders presented, can derive a number for manufacturer to stock raw materials for production and secure raw materials effectively. With web user input and continuance in bottle to be purchase was a definite number, this helps the manufacturer to stock better in correct number of raw materials amounts need in the future. With growing size of consumer, it will be easier to purchase raw materials in larger amount and cheaper. This also would be saving for the organization. Also, profits arise from less expensive raw materials would bring more profits to compensate for utility bills and payrolls.*

Although, from this point it was also advise by the manufacturer that some clinical information can be add into web system that can help increase manufacturer's confidence such as some clinical data and pharmacist summary on patients. This can increase confidence in terms of necessity of usage for long term use. This brings the need that a more interactive web system may be develop in the future from interactive web system such as Wordpress, which is available from many web hosting services. However, if the government would want to create their own version for the safety of organization secure system, they can create their own using PHP programming, it is also possible.

**In regards with synchronization, was your manufacturing efficiencies provides you marketing plans to achieve profit performance that enables you to sustain supply chain in raw materials needed for future production? Please provide your answer.**

In this interview, it was also seen the conventional system in collaboration with web system can efficiently sustain supply chain in raw materials for current and future production in securing market.

*In market review, the manufacturing efficiency were efficient in delivering high number of bottles. This was one of the key strengths in our manufacturing system. It can serve purposes of producing multiple types of tablets with different formulations from different raw materials. There were database of raw materials safety and pharmacovigilance reports that can be track for use by marketing department when they want to manufacture a product or reformulate to fit a group of consumers that doesn't want specific materials or they are allergic to specific materials. Data like these were readily available for planning. Abrupt changes in formulation can help in gaining profit performances. However, in cases of bacopa it is already vegetarian compliance and safe for religious practice. Bacopa tablets were made for wide range of consumer and they were non capsulated in order to prevent shortages in capsules when disruptions can happen.*

*Other information regarding raw material acquisition were also report to marketing team to make future plans for current market penetration and untapped market penetration. Also, our workers in use with machines can report their production efficiencies to meet new market demand when review with current market demand. There were constant checks by internals and meetings of efficiency and performance reviews that were crucial in business operations to meet visioned goals. Also, team managers constantly check with all raw materials and suppliers for readiness in delivering raw materials on time with sustainable supply chain, so it doesn't fall when projects launch. With all of these mentioned, most products that were produced by the government has resilienceness in it. This is because it was managed in mind, similar to all pharmaceuticals that were sent to government hospitals to take care of Thai nationals. Same thing was applied to supplement manufacturing. From marketing data, it can be seen that distributors and retailers also have profit performance in their sales from selling bacopa and Bacopa Selext.*

**Can web-based synchronize data, could re-order from retail and distributor enables you to perform strategic production planning, warehousing, and**

**distribution? Also, can you forecast production planning, raw material procurements, budget-save planning, through data visibility from web-based? Please state your answer.**

With the limited number of subjects that were involved with the study, there wasn't enough people whom ordered from the web retail to give opinions, however with the current number with the conventional management system the manager replied that it was already include in the daily production planning to perform strategic production and raw material procurement. However, if the web user system can integrate into web retail system, it would bring a better data visibility for production and consumer behavior and loyalty for market studies.

*The web user number in the study wasn't enough for calculation even though they can re-order from retail store from the web. However, the numbers of customers from the retail web store that has been running for many years was able to perform strategic production planning, warehousing, and distribution. It was calculated with conventional system forecast. In the future if the web user system can be incorporate into the government retail system, it can be use to calculate forecast for raw materials procurement and production planning. The data visibility from the current system is already good in managing production and market plan. If consumers can click and buy from web system it would greatly help marketing plan and production strategy. It will also help in customer loyalty and from this marketing strategy can be study on consumer and their conditions for new formulations and services.*

**Does synchronization enable to perform more efficiencies in operation that save costs, time, machine, human resource, and money? Please provide % margins involved in savings. Please provide answers.**

In the interview, it web synchronization made decisions faster and it can help decrease cost when operations can be made faster and less electricity consumption was made because the machine efficiency was already one of the key factors that it uses less electricity per manufactured tablet per time of day.

*Synchronization from web user can help decrease in decision time because the number of continuing users already confirmed the number to be produce in each quartile. It saves time for managers because they also have many operations to be*

*complete for pharmaceuticals also. The number to be produce when derived decisively with accuracy, time blocks and operations in manufacturing can be made faster and begin to work efficiently. Although, fixed cost on payrolls can't be changed but save cost on utility bills for manufacturing, warehouse, and oil for logistics can be decrease. Also, machine efficiency can also reflect lower manufacturing cost through same electricity expenditure but higher tablets manufactured. The savings were around 18% percent margin in total operations per quartile of operations. This means that when it confirms faster for production, the number of productions were used in multiple machines during the day and it saves utility bills for manufacturing and warehouse storage. The operation manager also tries to save electricity on processes between productions. The facility is large, so the faster operations can be done the more savings is increase.*

**Can synchronization provide visibility that production manager can create pre-plans to prevent disruption prior or while producing items to be delivered, in order to secure product supply chain to customer? Please provide answers.**

From the interview, it can summarize that synchronization can make pre-plans for logistic and prevention of disruption through talking retailer and distributor to stock up before certain disruptions from weather, political, and seasonal festival would happen. Other types of in-line production disruption there were amounts ready to be reproduce to replace with new batch and complete the production.

*In terms of synchronization of work in progress collaboration with certain information from backend of the web system for manufacturing operation and retail operation, the pre-plans can be created from the system that helps products to be delivered on time and able to secure logistics to distributors and retailers effectively. Although, pre-planning may involve talking with distributor and retailer to order faster if there's a point in continuous bad weather, political, and during national festival time of year. With these in mind for logistic operations, it is quite hard to deliver on time, for example floods in suburbs can last for many days to weeks with continuous raining. With this type of disruption, it may delay within few days. For production of supplement there weren't any problems on with production, so the pre-plans were as usual. In synchronization, the pre-plans were that bottle that were*

confirmed to be use, production follows the number like pre-ordered amount and forecast usually follows the number used in long term consumer and adds with conventional system forecast for the statistics in demographic region. This was a way that synchronization had help the manufacturing pre-plans. However, in the future if there were more use for the web user interface, it will be able to gain confident in manufacturing and pre-plans may be work with marketing department for future production plans when more formulations would be made to sustain bacopa user's adherence and make profits from new formula in untapped market.

Measures for pre-plans were made to prevent disruption while in-line manufacturing, such as checking machines before use and after use. Cleaning also have more than two people checking on the machine's cleanliness. While in production, many workers walk to check the tableting room many times with the tablets in drum check with cautious on tablets formed. Also, samples were taken for analysis using a long metal stick called "sample thief". Every part of the way from weighting raw materials to mixing and tableting were done in special care. Tableted bacopa were check with size and weight, then with bacopa extract standardization. The tablets that don't conform weight and size were usually taken out because it would not conform the quality checks. If this wasn't taken out it would cause effectiveness disruption and service recovery will be really hard for mass product recall from market. Although, this step wasn't in a pre-plan but it was in a master plan for quality and tablet manufacturing.

There were other types of pre-plans for emergency evacuation and how to take care of the situation when it happens such as fire drill, floods, and accidents in work place. For this the plans have been working out and exercise to make employees ready for any situation. In-line manufacturing pre-plans for accidents usually involved in emergency care for employees and if machines cause problem, usually a new batch would replace the current batch. New raw materials would be drawn from warehouse for new production. From mentioned in former questions, there were usually around 10% of raw materials secured for disruptions of many types. For midsize manufacturing, 10% raw materials were not a problem. It is 10% for each of two bacopa types in manufacturing.



**After synchronization, was your warehouse manager able to distribute goods efficiently when retailer and distributor re-order extensively and were conventional management effective in carrying out operations? Please provide answer.**

The synchronization has help in goods distribution and use in conjunction with conventional management for carrying out operations. This also led to pre-plans and strategic planning for goods distribution.

*The manufactured goods were able to distribute efficiently to retailer and distributor in metropolis and suburban. The synchronization has helped with pre-plans in production, warehousing, and logistics. It also helps the conventional system see the visibility of each user and their location of use, this helps in pre-plans for logistic and warehousing on both retailer sector and manufacturing site. Pre-plans can be made for secure route and secure amount that can continue adherence with new user increase in mind for the same demographic region. Product flows to retailer can also attract new consumer when they know the benefits of bacopa from medical news, their friends and family, store clerks, pharmacists, and physicians that they knew. Many market plans were also made when product flows happen in a demographic area and warehouse managers usually make plans with marketing and sales department for strategic planning for current and future markets in demographic regions that have product flow and increase sales performance. This was the time that product begins to make its reputation and, in the future, it might contribute to product booming in the future, so many plans and strategies were made and data from web synchronization were also brought onto table for discussion.*

**In order fulfillment and re-order for stocking from retailer and distributor, with web-based visibility were it efficient enough to help manufacturer warehouse saves budget on its logistic strategies and operational costs? Please state answer.**

It was seen that with web synchronization was able to produce re-order from retailer that adds up to a number to be manufactured in midsize that can be produce continuously to save manufacturing cost and doesn't cause disruptions in employee workforce when normal work days weren't causing fatigue. So, every employee has fair amount of work for their physical and mental strength. Operational logistic costs



were lessened by minimization of streets traveled, timing before traffic jams, avoidance of street repairs, and type of fuels used.

*With web-base visibility, it was able to inform the retailer when each consumer will come to visit the retailer again if their bottle has been to a point near empty. For each retailer, a number of consumers may be count by clerks and pharmacists where it adds up to a number that can be calculate for re-order in long term use and new bacopa customers would also be evaluate by healthcare clerks for long term use by which type of bacopa at first, sometimes the if certain customer were sensitive to stronger dose, they would be suitable for non-extract bacopa which wasn't a bad thing because smaller doses were also effective for their physical build. From total considerations, a suitable number for re-order would come to agreeable point between managers that this amount will be order continuously from GPO retail pharmacies or distributors. For distributors when they have their own retail customers, usual collaboration is similar under web synchronizations, when customer behavior was one of the factors that pharmacists had to consult and study their usage in long term and adherence. In terms of efficiencies create by the retailer was that they were able to produce better fulfillment for re-stocking from GPO retailer and distributors that purchased from GPO. The re-order was able to make midsize manufacturing batch that saves cost on manufacturing and using non large warehouses with delivery on next day was a continuous savings. Also, this creates a non-fatigue workload for employees in the organization. This also prevents disruptions that may happen during manufacturing many supplements and pharmaceuticals also, when there's available employees for the disruptions that may happen in other line of manufacturing.*

*In terms of logistic operations were the same as explained before that anything may disrupt travel passage or slow down traffic would be avoided. Also, management of roundtrip logistics also were planned from logistic manager when taken longer routes that doesn't take much time in the morning and came back to an area that may have traffic jam would have to use super higher way with small payments to save time for next round of transport. This was also planned with web synchronization where logistics people knew how valuable the goods will be sent to each distributor and small retailer. It was done so they know value of things and also can answer*

*managers when disruption in accidents may happen and recovery can be done soon. All were information that were collaborate between departments so the quality of work is in the professional level.*

*Apart from warehouse save cost, logistic management also save cost when certain transportation also has changes from oil to gas for transportation fuel. This also led to some save cost in logistic route that can't be avoid, so these were also some strategies for logistic cost saving that enables organization to perform efficiently under economic sufficiency during pandemic outbreak and current economy when it is recovering. Moreover, disruptions in the street if it can be avoided from the beginning, the logistic manager would brief their workers before perform logistic function every morning. These were everyday work that help the organization to strive for the best.*

**Overall, does synchronization perform better than conventional management, or perform well together with conventional management as addendum?**

In the present time, synchronization was seen as a good way of management that can be add to conventional management because the management and processes in operation were set from the beginning and it can't be change immediately. So, in the research it was studied as additional way to help enhance areas of conventional management where it lacks information and visibility and was adapt from there on to produce good management outcomes for the organization.

*At the current time, web synchronization performs well with conventional management when it can add visibility into the management and people work closer in collaboration better when there's more information present to them. Also, web base can act as communication medium between consumer and healthcare provider in retailer when a continuous healthcare services happen at the retail or distributor. From the situations, accumulate information from retailer can be inform to manufacturer for prompt decision in manufacturing.*

*In the future, when synchronization can interact with more user it may present more visibility for marketing decisions to make new formulations to tame the untapped market. Also, with the easiness of order and pre-order it may replace many works done in forecasting supply chain, when the rest of populations that hasn't*

*become user of GPO bacopa can be calculate minimally using the statistics that were used in conventional management.*

**In managerial position, would you extensively use the synchronization proposed in study to further improve your production planning and marketing to meet industrial performance and meet market demand in an untapped area?**

After provision by the managers, it was seen that web synchronization is a good help to conventional system and was seen to be able to help in many ways. In the future, it may be incorporate into conventional system and merge into something new that can be ready for handling consumers through web interaction and further interaction with pharmacist and clerk at retailers and distributors. This creates easier management and win-win situation for retailers, distributors, and manufacturers. Also, the industrial performance would be easier to manage when marketing can help steer how customer make orders so it would help manufacturer to produce in the best cost-saving way and fastest way to reach retailers and distributors. Below were interview summary from one of the top executives involved in marketing and production:

*Definitely, the synchronization through use of web system have improve production planning in an easier way when pre-order was made from the web system as a signal to prompt retailer and distributor to create a fulfillment at the manufacturer. This leads to faster production decision when the retailer and distributor warehouse needs to be refill with new batches of bacopa extract. In a continual education and consultation with pharmacist for continual long-term use, was a point that ensure customer will repurchase again. When the repurchase is made and warehouse stock begins to decline, the fulfillment re-order begins. Many orders from numbers of distributors add up to form midsize manufacturing batch that enables continuous production. This allows for prevention of disruption to happen and if happen during in-line, it would be able to solve within time and non-fatigue workers will be able to solve it in time. This is one of the bases that makes up worker efficiency and performance during production to meet industrial performance standards without disruptions from accidents and be able to prevent accidents. When planning with synchronization happened, production time is less than before and it gives time for planning new formulation manufacturing to gain more profits from*

customers in untapped area marketing. In the present time, it is still in the process of making new formulations but the answer gave was an assurance on the manufacturing capability to be able to manufacture newer formulations to meet the untapped market. The machines were already efficient to handle the job functions. If new untapped market were conditions and symptoms caused by COVID-19 and bacopa extract can help alleviates neurological symptoms, all the machines can produce bacopa extracts or variations in formulation for the untapped market definitely.

**With synchronization, were your production line capable of withstanding high-volume production in high market demand situation? Please explain.**

From the interview, it was found that the production line were capable of high volume production to meet market demand, and with the use of web synchronization to help plan strategies for production and logistics.

*The visibility from the web synchronization enables us to view number of tablets used during the day and how many tablets were already used from a bottle being used. From this visibility, we can derive the number to be discussed with distributor and reseller for customer in each demographic region. During high market consumer demand or distributors' own high demand to penetrate health market, the machines and raw materials were ready for large volume production and with synchronization it can help sustain long term visibility in consumer whom ordered from this large production. Also, if in the future web system has very high consumer number, it will help give visibility in bottle numbers need to produce for how many people within what length of time. Also, demographic region that needs to be refill first can also be planned strategically using the web system also, before production planning. The fulfillment re-stocking order would probably be very large and prompt for high volume production which isn't a problem for the machines to produce volumes needed. For normal production in all machines can reach a million bottles in a day with a little bit over time of 2 hours. The number growing customer hasn't reached the need to produce a million bottles per day yet, so this can answer that during high market demand it won't be a problem for manufacturer to produce this number. However, in the future if bacopa extract were to expand market into*

*Southeast Asia countries, it can take a full advantage of manufacturing efficiencies that machines can do.*

**Do you feel that with web-based synchronization, in the data provided can provide planning efficiencies for warehouse performance and logistic operation that matches current and tomorrow's market demand? Please state your answer.**

It was confident that web synchronization can provide data for warehouse and logistic operation that meets tomorrow market demand.

*Web data can provide data that can be used to make plans to efficiently use the warehouse for storage that was efficient in energy saving and able to control new stocks in and out of warehouse efficiently, this was done by pre-planning with sale department that sends order fulfillment to manufacturing plant quickly after received order and payment. With the mentioned tablet taken, bottle unused, and amount to cover market demand, all of this can be combined to forecast future market demand and current consumer demand. Strategic planning can be made to ensure the continuation of product in the market while on-shelf and on table of consumers at home. The production manager prompts worker to set up production with bill of materials, then start to produce the amount needed. During mid-day the quality manager have their workers check the standardized tablet and release when finished. Many machines in this were automation systems, with some were semi-automatic that doesn't require much time when all of equipment were available for use. The manufacturing operation was efficient enough with available tools for production and quality analysis that it is able to tackle high volume demands and logistics were efficient enough to provide delivery with minimization of disruptions in logistics in mind. Also, high volume delivery also saves fuel and gases when delivering multiple items to customers.*

**With synchronization, were your purchase manager able to secure raw materials in time and budget-save with conventional method of management and marketing?**

With synchronization the number to be ordered in raw materials were obtained faster than the conventional method. Since, the number of users were already present



with visibility on long term continuance, the purchase manager can approximate quickly the number in each quartile. In the future, if more users were to use the system it would definitely be easier in raw material procurement calculations and obtain the number for purchase in good deal for more raw materials per baht spent or dollar spent if local Thai bacopa have shortages in market in the future.

*The conventional method has very accurate statistics in approximating numbers to be produce for distribution into retailers and distributors, this was done in early days to present day when there's statistics for refilling warehouse stocks to be ready for distributions. However, with the web synchronization the numbers needed to be produce was provided by consumer at web user system. The information provide was able to make a plan for strategic production that can reduce production cost when it comes to utility expenses and logistic operation costs. These were seen as budget saving, however with high production demand it is already a budget saving as the machines were efficient at high production with a minimal increase in electricity usage. All of these can derive that manufacturing budget available can be spent to achieve high volume with budget saving in between processes of manufacturing.*

*So, when the market strategy had made a successful promotion that requires high manufacturing production, the manufacturing operation is already efficient with the numbers needed for market sustainability.*

**In synchronization, does your product marketing efficiently produce order from retailer and distributor, which efficiently improve manufacturing production that leads to performance in profiting and budget saving.**

The manager interview gave an explanation that:

*The marketing team has produced a lot of orders from new retailers and distributors in contact while the long-time partner distributors were also having increases in orders to supply current and new customers. All of these commotions happening were able to produce a production plan that meet all demands from new*



*and acquainted retailers and distributors. Our facilities were large scale manufacturing facility that can accommodate large productions within short time, it isn't like small private manufacturers, so everything appears to be sufficient for the manufacturing capability. The manufacturing capability in production were set for profiting from high market demand and also budget saves as manufacturing increases in numbers. This means that each machine is very energy efficient and doesn't consume electricity from increasing speed in production. Also, in terms of orders that pushes for an improvement in production there were no needs to change excipients for raw materials or further modification of processed raw materials for enhancing the machine working in high-speed conditions. Everything was set from research and development department to prevent flaws in production. So, this can derive the organizational efficiencies in strategic planning and carry out the functions effectively to meet performances need to achieve high market demand and supply chain sustainability to retailer and distributor.*

When interviewed on “Also, incongruence with efficiencies in raw material procurement and supply chain sustainability? Please state your answer.” The manager replied:

*As mentioned before in the prior questions, our meetings and frequent calls with suppliers in continuance was able to acquire numbers of available supplies for each quartile and forecasting future needs in supplies with them. This makes organizations involved very effective in preventing business failures during high market demand. They were also acquired information about manufacturing capacities for high market demand situation that how many can they supply at maximum and how many suppliers' manufacturer must the government manufacturing facility must have to accommodate its ability to mass produce bacopa tablets in less time. This means that it can mass produce tablets into warehouses faster than bottles production in one manufacturer. It would be a bottle neck for the warehouse to keep the finished product and wait for the bottle supplies to come in. From this it can be seen that the manufacturer is very diligently at work to make their supply chain sustainable from collaborating with suppliers. For raw materials in dry bacopa powder, they were also*

*frequently asking of their stockings and availability every time when procurement order has been made, from this a number can be forecast in how many raw materials would be available for extract bacopa and non-extract bacopa. Also, it can tell whether if can suffice the market demand within a country or not. If a market demand can't be supply with bacopa extract product in time, usually further work in acquiring new suppliers would be done and calculation of logistic time follows for working out the timing in production.*

**With synchronization, were you able to forecast manufacturing operations effectively including market demand, leading to supply chain sustainability? Please state answer.**

It was seen from the interview that in market demand, numbers can be derived from pre-order like continuance confirmation in web system or at retail, then the number of bottles would be produce to meet the current demand while next number in demographic region demands were calculate using conventional method effectively also. In manufacturing, there was no need to forecast operation effectiveness of being on time because the number of machines were already capable of producing tablets that exceeds the number of people uses in market size.

*With synchronization, with the current number of users was able to determine market demand effectively when all were long term users have set their preference to continue use. Although, the short-term users forecast can also calculate in statistics in conventional management and from prior market studies. With the number of users found effective use in long term, there's a confident number at hand to manufacture these numbers like pre-order. Also, if the number of users increase it would be a lot of pre-order coming in and all we have to do is to set time for manufacturing and schedule everything in closer interval so it saves money on manufacturing, warehousing, and logistics. Time is shortened while manufacturing machine also increase production rate, warehouse and logistic is also fast and effective. In terms of forecast manufacturing, the in-line manufacturing was for bacopa most of time while it has been proven to excel in market demand. The number of machines can produce to meet market demand, so there was no need to forecast if it could meet production time. This was the goal of the manufacturing operation that when it comes to*

*production that production capacity must exceed the number of market demand. It can many things in business such as disruptions, when products were lost during logistics. A new batch can be made effectively in short time. This also applies to brand awareness that product while booming would have product to sell all the time, and it also prevents shifting cost in some way through quality popularity.*

**With information given through web-based in synchronization, were you able to forecast sales similar to retailers and distributors?**

It was seen that web synchronization help organizations involved and it is easy to manage future sales and distributions with information sharing with manufacturer to supply product to their warehouses on time. The forecast of sales for population of users who weren't web users can be calculate at the same value for retailers, distributors, and manufacturer. In forecasting numbers of bacopa extract to be produced was from the consultation of pharmacist and clerks at each retail, which long term uses can derive numbers needed for number of bottles to meet demand in length of time that consumer agreed to use.

*The information from web user interface has given the same numbers to retailer, distributor, and manufacturer. So, all of organizations involved have the same number to collaborate with consumer management, warehouse re-stocking of retailer and distributor, and production to sustain supply to these warehouses involved in sustain products for consumer's adherences. The sale was easily forecast from the numbers of consumer that is using bacopa extract for long term.*

**Do you feel that synchronization sufficed the need for your manufacturing management?**

From the certain talks in the interview, it was found that web synchronization is perfect for the manufacturing management in terms of real time management. The visibility is real time for each day, the number of people using bacopa every day can be approximate for use with raw materials procurement when you work the numbers in forecast, also when the real pre-order or confirmation from the web system shows up, consumers usually get their new bottle or multiple bottles at the retail store.

Usually, it isn't a problem for retailer in metropolis and suburban to refill their warehouse stocks when multiple bottles made sales with promotions or it is already inexpensive to buy. However, in the far away province a distributor has to collaborate with the GPO more in order to manage distributor's situation in their demographic region.

It can be concluded that synchronization suffice the information to further excel manufacturing management wherever the information can explain its vitalness in applications.

**How do you feel about synchronization in its efficiencies in production, marketing, warehousing and distribution, from web-based data visibilities that enabled further management planning? Please state your answer.**

From the interview, web synchronization helps in many ways from faster decision in production that saves time for marketing strategic planning with research and development to work out new formulas with manufacturing operation team. This was crucial in many ways that improves organizational performance in time saving in order to create new product from new ideas or consumer needs.

*It was very good in providing numbers need to plan production in each day in producing medium size batch of less than 1 million tablets per day, distributed among few machines running at low speed. The effectiveness was very effective in each machine because all machines of rotary type is usually most effective at low speed. Although, there were number of factors that also affect how machine were effective or not from powder formulation level. It is up to research and development department to come up with formulation that has best flowability for high-speed machines, that also doesn't cause disruption while in production.*

*With web base system, it allows for marketing to make plans for market acquisition and derive a number for production manager to plan for strategy to meet the market demand during launch and future product life cycle. For the conventional management, the machine effectiveness were doing very good and with synchronization it serves best in producing immediate numbers to produce quickly and effectively while also watch out for disruption that may happen on the traffic. With all of these brought by the web synchronization method, it was wonderful.*

*Current visibilities through web system enables market managers to plan for new demographic region territorial that can be penetrate with bacopa extract for their conditions. This derive many plans for logistic managers to plan for transportation of goods and safe routes to be taken. The warehouse and production were close to each other, so scheduling were usually done after receive orders from sales and strategic talks on logistic happens afterwards to gain number of transportation available for fast delivery. All of this happens very quickly within few days, so the machines would be ready for new production and have availability for new formulations by the marketing team that works with research and development department. The synchronization method gives more time for other planning, so the work here is very efficient with less time consuming.*

**Please provide additional information on how you use information further to improve organization efficiencies through web-based synchronization.**

In the interview, the web system was in the beginning of study that focuses on production efficiencies that meet market demand and supply chain sustainability that can provide continuous bacopa supplies to retailers and distributors. This was done effectively with good performance that exhibit in retailer, distributor, and manufacturer. There were opinions from the operation manager and marketing manager with research and development team that if there were more symptoms other than symptoms for bacopa use, it would be very helpful for them to extend market product ideas and development. It would give a visibility point for new research.

*With web-base synchronization some information were available for visibility and some were not available for some part of the organization. The unavailable information were the current symptoms apart from symptoms for bacopa. This can be used for formulating new formulations or formulations for a group of consumers that has similar cluster of symptoms that were different from new formulations. For example, if new bacopa formulations for mass consumer may have bacopa and vitamins that can help mental stamina this would be for mass consumer. A narrower formula would be a combination of bacopa extract and supplement that were considered as brain food as another ingredient to increase brain function, this can help in memory recall with bacopa extract.*



*At least right now, the visibility of web system has been excelled in giving numbers to produce, without having to go through forecast much. If done properly in the future, forecast would be a small part of management because the nature of long-term use has already procured number of consumers for bacopa extract manufacturing. Also, with the information that further improve organization was the awareness of bacopa value and logistic disruptions awareness. This consumer in each demographic region was also explain to transport driver of how consumer in each region were important and their severity was also mentioned. The visibility creates product value and its importance. This also creates drivers valuing consumers also. In other processes, bacopa production was seen to be a new product that was valued by workers that it helps people that were stressful and helps aging people from mental deteriorations. From this, it creates mindset for mindset to perform functions effectively that performs well with shortened production time through help of efficient machines.*

*For other efficiencies in communication with consumer, some handouts and leaflets were also given with each bottle for pharmacist to reach customer more with knowledge and education in retail sectors. There was some information that can explain for usefulness in bacopa extract that were more effective than non-extract bacopa. This was helpful from the system that has a point in the backend system that was accessible in level of severity for the reason why they use bacopa extracts. The web system was useful in a leading tool for consumer relationship management. It can be seen as a tool to reach consumer to help them realize more about the product that they were using, thus increasing product value and customer loyalty.*

**Do you feel integrating web-based synchronization into your organization in the future to improve product marketability, customer patronage, and improve organizational efficiencies in areas that lack data for visibility in order to improve? Please state your answer.**

The interview with executives shows an interesting point that web-based synchronization shows effectiveness in manufacturing operation and help organization to operate easier and faster. It also would be great to incorporate the new system into existing conventional management system.



*It would be great to incorporate web-based synchronization into the current system for improve overall efficiencies and performances in all areas of organization operations. The web-synchronization increases visibility in many areas such as consumer behavior and the web interaction has led to behavior that shows more cooperation for their own health and also it leads to customer loyalty in long term. Store's location was actually patronage for normal everyday people when they go to school or to work. Many stores location is situated in community area and large markets that were important distributors, while some areas were accessible through small pave ways but still a very active zone for distributing many goods for government pharmaceuticals and supplements. The retail also serves many consumers that weren't market goer for distributors that came for orders.*

*The timing for incorporation of digital web-base synchronization may take time to spend on development and testing. It may come from other government organization that can do the function if fully ready to operate. This is because it is important for clinical use in the future and patient data is important for future medical use whenever it is available at hand for the physicians. The effective dose of bacopa can immediately be use to approximate patient's level of severeness and chronic condition progression into other disease. Information regarding bacopa use can also be helpful in evaluating patients for physician, prescribe drugs that can be use with other drugs and so on. With the advancement of certain medical scans, together with data of bacopa use may be important data for research that may find bacopa extract protective for certain type of cells in neurological and non-neurological if there were any data presented. This was an example that medical research today can progress better than research in the past. So, the incorporation of web-synchronization is important in many ways, in summary.*

*For the current use of web-synchronization in consumer behavior visibility, it can help manufacturing manager and sales to forecast future uses and estimate raw materials purchase. Marketeers can use the data to study the progression of conditions used and progression of current condition into another condition that may help in formulating another supplement blends that can help more than two chronic diseases at once. From the visibility, it can progress into organizational research for better services and outcomes of consumer.*

*The current use of web-synchronization had also increase the KPI scores of current employees that they function more usefully with the help of easier forecast from using web-synchronization data. The performance of manufacturing operations was also better when there's an increase in re-order that can increase productions while saving electricity cost from increasing machine performance on the turret speed in multi-station machines.*

### **Synchronized Interviews Discussions**

It is seen that various factors have effect on customer choice on purchasing, being Pricing performance of retailers, Product knowledge and its values, Sales promotion through pricing, and Consumer satisfaction. The research was able to see what customer want and need that have effect on long term usage and economically worth throughout the year and future economy. The research had answered adherence can increase retail operation when it made income through operation cost saving, sale efficiency, and sale performance through the quarters. Retail efficiencies affect stocking, warehousing, and manufacturing strategies that can be seen through statistics, when combine shows similarity in multiple regression, with significance in all variables. This verifies that all variables were interconnected and can be said that all operations were in synchronization or having effect on each other through the business operation.

From operations of retail sale having effect on warehouse stocking helps the manufacturing process when there is statistics available and web synchronization visibility that sales have increases within an amount of time, this can make way for managers to make strategies that suit production amount to fit market size at the current time. So, it can be said that all machine put into use would be calculate for

production efficiencies, which in this study is able to make good amount of production for current market size and future market size. Logistic management and operation were secure at risk minimization level to operation level, there weren't any fault during research and customer receive goods on time. The operation was synchronized to calendar and traffic advises on news network. Operations management on retail sector and manufacturer were shown to have good operations that can excel in future markets with product having good quality for competition and this can be made into portfolio for gaining finances when there is problem with business operation whenever needed for improvement in the manufacturing system or manufacturing materials, to prevent shortages in the forecast future. This prevents everything from raw materials to shifting cost that can happen during product shortages in market, so the retailer and manufacturer would not lose its customer along the market competition.

At last, the supply chain synchronization has shown to affect business survivability from pandemic disruption, economic disruption, and competitive disruption. It helps continuation of market product and secure future manufacturing of products from disruptions through strategic planning, operations assessment, and continuation of finding new problems to prevent.

Most consumer prior using web synchronization for tracking adherence were using the supplement continually and some were just starting to use for their needs to increase mental stamina, when they seek herbal ingredients aside from vitamins. The frequency usage is every day and most enjoy the results after using for more than two months. Most life style of users were sedimentary style with aging that difficult their health and memory. Many users were in their mid-ages, adult seeking herbal ingredients to improve mental function and fatigue from work stress. Health problems for indication that customer purchased was mostly memory deficits, memory improvements, mental fatigue, and improve mental functions. Many consumers when they continued to use Bacopa extract, it is because they need more replenishments to health needs in every manner. The discontinuation hasn't been seen during the research, although it could be discontinued if their health were better for mid-ages and

then repeat again when they need the supplement again. Continual use was seen in geriatric that taken every day can improve their memory function and prevent deficits.

The pricing was affordable, along with other competitive brands within a range lower than 500 baht. This can be divided into two months period, so the true cost was around 175 baht per month, which is very economical for Bacopa extract. Also, some customers felt it was expensive seeing the price prior to dividing daily use for 60 days' time. The economical pill price was around 5.8 baht range. Within this price range the price was not expensive for geriatric people who has needs to use supplements that they can find. It was continually economical when taken on every day basis. Although, in case of mid-age people, when taken for stamina and mental fatigue a bottle of 30's with lower price would sound more economical.

The trip takes to retail stores were quite far for people living in small towns far away from large city, sometimes it took 30 kilometers trip to purchase the item. However, it is not a barrier to purchase because sometimes when they travel to capitol city to purchase food, retail pharmacy was one of the destinations they could reach within along the way. Most people feel comfortable to purchase the supplement, as reputation of manufacturer seems make fair amount of price at first, then lower the prices two years after to very low price. This was seen with the generics they produced in recent years. Most customers were thoroughly satisfying with effectiveness and affordability and was glad that is available in market for consumers that need the product to be available all the time. Some felt that if made in blister packaging would be more affordable, mostly for people who live within city area because they can commute often to retailer. Consumers tend to use long term when vitamins were not enough in helping their mental stamina and memory. Also, some people with neurological disorders seems to have it as supplement or alternative medicines. Some people within family seems to use it as morning pill to improve mental stamina and thinking. Within the next ten years when the price changes increment around 10% from inflation, customers who found it effective have positive respond to use the product continually. Which means that the product doesn't feel expensive.

The quality of product was good and extracts researched were proprietary as told by clerks, assistants, and pharmacists. The healthcare provider is reachable all the time through telephones and accessible at their operating hours. If there was any question that needs to be inform further, they can be contact for the problem. The clerk was able to provide long term information on use benefits in long term use. Safety information of supplement use with current drugs was assured. The promotion of price reductions was seen in some stores depending on retailer. Although, there was no manufacturer's promotion at the time of study. Many people were happy to use in long term as it was affordable from their current income expense, while a large portion of people in the study were happy to buy with current pricing without regards to known long term use. This is because it is affordable. Consumers were able to adhere to pills on economical price at first purchase. When stress is high and feelings in need also creates force their decisions to buy and seek items that can minimize their illnesses. Promotions wasn't all the cause of purchases and adherence but in long term when efficacy was shown customers show return in re-purchase for storage and future use.

Customer education was guaranteed from clerks and assistants on safety, long term use, efficacy, ability to use with pharmaceuticals, and every day usage. Proper indications, timing, frequency, forgetful, and maximum benefits of use according to conditions were affirmed and can connect to stores when there's a question to ask. Long term usage of bacopa was good and supplement consumer education have result in adherence to long term use, when long term safety has been assured. The pill effectiveness was shown to make adhere to item use, can be seen in people with chronic disease of neurological deficits. Barriers using smart phones and computer to web access shown no barriers to continuously access and make in puts for storage and retrieval system.

So, in this result it can be state that consumers have make use of web system as digital calendars that can keep track of use from time to time but if improve it would make better use with enhance ability that can be more useful in connecting people, the consumer and retailer experience that can be built and enhance productivity that hindered business visibility in the future. With doing so, it can make



ways into digital patronage that may successfully manage patient care with digitization of simple click that enters consumer into a better world of healthcare.

Consumers after synchronization, Web tracking was a convenience for keeping information of use, it is very crucial for the health-centered people who may pay more attention to their health in particular. Although, for the norms it was very good at keeping track of things and there is something to do more on the computer and on the phone. It is convenient for the storage and retrieval with ease of use. The product during the research wasn't discontinued in people with chronic illnesses and health concerns of mental stress and fatigue. Although, it can be predicted that with non-chronic illnesses the discontinuation may happen but within the reach of returning use when certain factors are involved. Web referral to purchase bacopa online is a good way to remember to repurchase when there's less time available or preventing to forget to re-purchase but mostly when the bottle almost reaches less pills, customer return to retailers for re-purchase. The product use was report as an essential product for long term items to have and the web interface makes it easier for them to keep track of pills taken when encountered with their physical and mental stamina levels and within next five years more than 78% of people answered "agreed to use the product with web tracking as it convenience their use and remember to use bacopa for health benefits." Also, within the next 5 years, the people who were having mental stamina problems within the age in their mid-50's will enter pre-geriatric stage where crucial supplements can benefit long term healthcare.

Problems that may arise from usage is the internet connection, sometime if it is down for long time, it may be a barrier just for the length of time involved. However, the number of pills can be store later, in preventing flaws to input data. The web system was easy to use and no problem arises from the system, the only barrier is the internet connection. The system never has down time for access or server unreachable. The usage of report adherence was easy and the web tracking makes it easier to record inputs and make progress in self-care. Although, the use of bacopa is quite easy since it had to be taken one capsule daily, so if forgotten for the entire day, it can still be taken at dinner.



In the study, there were no barriers to using phone and computer since geriatrics were taken care by their caregiver and people at home. The scan system is very easy to use, it was done by scanning the sticker that was given at first. Attaching sticker to bottle and scan was easy and when scanned it took consumer to direct web that enables one-click to store data. User can review number of pills used and times visit. Web base system was effective tool in managing records similar to calendars and booklet reminder. The retail store that visits had item stocks readily available for consumer and it is better when use the web system as a remind to re-purchase when almost end. Phone and ask is effective way to check the availability at first. Most retail store have strong skills in consumer and patients' management and were able to solve many things regarding healthcare. Although, with the web system, it was agreed to some that having web system that is more interactive would be better and some suggest easier application access made for iPhone and androids, since they can click on the phone rather than scanning the barcode on the bottle. This makes it easier for them to access and checks their user report.

In management prior retail synchronization, management capabilities data returning from managers in retail stores and manufacturing showed in congruousness with research hypothesis set-forth, using "before and after" questionnaires. Management seems to be running smooth with every stock in warehouse refill on time every month and quartile. Delay in far provinces may happen at times but several methods were done to manage customers such as telephone calls for product pick-up. Stocking in more than usual numbers were also seen, if the provinces were far away. The profit is in median range for most pharmacy retails, if compared to large retail pharmacies. The profit wasn't too high because of economic downturn from pandemic crisis and economic insufficiencies that happen to many countries around the world. However, profits were seen gradually after COVID-19 pandemic, and there were large orders from distributors and continuous orders from retails from government manufacturer as mentioend in the interviews.

Many retail runs fine with store clerk, pharmacy assistant, and pharmacist in retail store. Profit gains in economic region seem to have more sales in large cities. With trained clerks, they can provide information very well. Pharmacy retail

managers can approximately product customer needs, although there weren't any promotions at the time for bacopa extract because it is quite new to market until decisions can be made. However, in retail pharmacies buying in large quantities seem to have effect on gaining profits from large retailers that act as small distributor and large distributors. There were reports of numbers of re-orders that were made several times to refill their stock needs, with increase customers. So, this would alarm the manufacturer for manufacturing prompt and market gain calculation from the supplement market that was untapped.

The workers in retailers can carry out duties every day. However, sometimes the clerks may forget to mention some points when number of customers exceed number of caring workers within the retail store, numerous times these were rush hours and sometime rush customers finding items that were unavailable from other retailers and need care for order at the providing retail store. In normal work days the working action of clerks and assistants were satisfactory on communicating and effectively carry sales promotions toward customer interesting in products covered their needs. Store assistants were able to fill in the shelf stock and prepare re-order correctly on time with good communication and tracking with store managers with many products on the market. Clerks were able to push items and promotions in terms of discounts ,effectively to customers. They were also able to provide information to customers on supplement products. The retail stores also have no problem with workers leaving but in other retails in far region holds no report on employee-leaving factors that could affect retail sales and management.

Although, mostly in non-government settings the retail must be able to push product towards users in need. As of regulations regard pharmacy act, the national laws require pharmacist to have knowledge in pratice for supplements, that starts to regulate during 2565 B.E.

With retail clerks having experience with store more than six months, the efficacy of selling good is seen and expertise of job function was seen prominently, which allows to see synchronization can be integrate with ease in the future. The manager thinks that web synchronization can help with store clerk in predicting customer, thus serving current and future needs.

When asked about using synchronization, managers replied “ease of use in order fulfillment for warehouse re-stocks. Refill estimation was complete faster with the ability to know customer needs and satisfy them. More efficiency could be seen in larger retailers as more purchase rate tends to be more happening than smaller retailers. The tracking of usage among bacopa users was useful in prediction but may not be as high as it looks when calculating amount order in some retail. However, the synchronization proves in marketing decision to sell the product continuously when considered used as long term products that need adherence.

This adds to convenience for customer and in regards to pandemic the supplement may be successful if it can help with mental deterioration in effect case. The visibility from the synchronization helps in planning work force by placing right people to customers. It can be seen in some settings that some customers came to store to see the same person at work, for personal reasons that they require attentions they need. With synchronization when review data when seen effective, it can be used late as effective supplement for other health conditions. It may help customer that have used for and still be used to make good sale promotions for new customers before the supplement exits the market segments that were in less use, from inability to compete with new products on market.

Synchronization may help with selling techniques where taken into consideration of retail location, demographic, customer needs for supplements. Information may be used for customer care after sales. Also, it may help clerks finish their daily jobs earlier and more confident as the synchronization is collecting information in real time and knows when the customer would continue or quit the supplement. So, there is enough time for decision. This may help retail store to have the time more planning and decision. Also, it would enable the stocks to be refilled on time, when visibility is seen through customer cooperation to provide data for the retailer to report to managers in retail and manufacturer.

The manager hoped synchronization study would help clerk finish their duties earlier, so they have more time to prepare for selling items through knowing how to promote and training with managers, by reviewing information and maximize ways to help customer reach service satisfaction guaranteed in every visit. Also, the

synchronization can help make better promotion made by retailers when purchase with other items in stock that weren't manufacturer's promotion. Also, it would be good to know if customer's were satisfy with the supplements. It also helps customer to keep track of their use and expenditures, which can provide ways to make promotion or discounts to loyal customer.

The manager think sees that synchronization can help make profit in each quartile and help to determine the customer's expense. With this information in mind the pharmacy retail manager can manage the retail store to have strong supply chain management for single items and hopes to expand to multiple items if web system can have more product involve, similar to many enterprise management software or online base systems. The manager think that report system can provide information can be use for making decision to provide supply chain more readily available, if customer satisfactory outcome is achive through effective adherence to long term use of single items.

Managers seek to establish pricing to meet long term customer use when it may help to create value business for making affordable price and sustain retail service market segmentation share, similar to large chains and distributions practice that were know for their low price products per piece similar to outlet retails in Thailand. The management think synchronization can help use the data to correct customer usage in long term according to adherence tracking. Also, tracking would provide crucial information for analyzing to adherence tracking. Also, tracking would provide crucial information for analyzing customer for long term use that may create satisfaction in service and maintain loyalty from returning customer. Also, be able to produce promotion per specific customer to help alleviates their expenses monthly. Also, when the manufacture notice the amount of goods need for manufactur to scatter the good correctly through retail and distribution channel. All wholesale will help predict manufacturer outcome for sale performance at each retail cener making it able to make continuous earnings every quartile.

In terms of current management, the retail order were able to give correct information for the product use, since it is manufacture by its own manufacturer system. For maintain supply chain, it is able to do quite fine for market entry stage.

Consumer are well please with the quality and retail services. Usual work done by clerk were quite normal, certain jobs were divide between workers. Workers usually know their function and there's no need to adjust any through verification to managers. The store open long time ago as a part of government plan to help distribute manufactured goods while maintaining good services to customers and serve as communit pharmacy also. The customer were most local people and the stores were capable of take care of large purchases and replenishes their stock warehouse.

On a daily basis, there weren't any problem with stocking products that have large orders, the warehouse were able to secure new refills through manufacturer's transport within vicinity. For far retail distributors, they manage their own stock and warehouses. It is is solely independent from group retail stores operate by the manufacturer of this research pioneered.

Customer relationship management enables to create customer relationship with customer in long term, the synchronization would be good addition to the system that is used wtihin group retail system. The customer serviced by store clerk were more appreciate in recent itmes with former promotions, offers, service, and customer care. They can provide long term advices on many products including pharmaceuticals, since the retail pharmacist also were acquitained with pharmacovigilance. Demographic studies of population in vicinity of retail communites, the clerk and workers were able to promote right supplement at right price for customers when taken into account with long term commitment tow ork and long term customer care, sales performance can be seen with effectiveness of delivering promotions and information regarding product usage. The store continually made profits and have good controlsupply chain for the item in study. Although, the synchronization had not been practice, so it would be a good implementation to help current work of retail workers, pharmacy assistant, pharmacist and retail managers.

Retail pharmacy management after synchronization have more capabilities in interview data returning from managers in retail stores and manufacturing showed in congruousness with research hypotheses, using "before and after" questionnaires. After synchronization managers see sustainability in refilling the stocks at retail



warehouses. It can create prolong sustainable sale and able to save some stock when product sales increase, which information can be use within store to assure stock minimums. Also, the stocking of retail pharmacies group can function as products that can be transfer between retail clusters, similar to franchise practice. This is seen from retail pharmacies in non-government sector. Although, increase in sale wasn't much in retail sale of small retail pharmacies but profits were still seen and was satisfactory.

The synchronization made daily task easier and there is something to do when information becomes visible, such as adherence, everyday use for long term and customer satisfaction that can be prepare for next visit. All of these were challenging when it comes to retail management. It is not business any more. It became services and latter trend becomes transformative in many ways. Information gathered help manager see things more visibility with customer who use the web information technology for reporting. Even if some have missed day in reporting, it was a good start. A good primer for striking question of "why and how." This creates communication and customer rapport, then was used to break barriers in assertiveness that was important in healthcare communications. In a way that customer felt that they receive attention they need from customer service clerk. The synchronization was able to produce predictive data for analysis customer wage. Every sale made latter were data that can be turn into analyses for future promotion and sales. It creates long term good customer experience. It also builds brand loyalty and retail service where good experience was built continually.

Sales performance were seen when workers can analyze what information must be communicate with customer, before and after customer analyses can create informative and insightful meaning to customer. As did repeatedly, it creates sale efficiency and sales clerk respond faster to clients in need. Clerks were able to service and analyze needs for people in demographic region, so this brings in mind that with synchronization isn't buying and selling anymore, it gradually becomes community service as more customer and clerks get to know each other well and acquainted. As a result, sales were easier and product were easier to push, when trust were earned through continuous service accounts.



The sale was able to reach desired goal and continually made sale progress in a continuous fashion. Synchronization help clerk become more robustly efficient in retail jobs and able to fulfill long term commitment to service customer with the knowledge that they were trained. It creates service sustainability when clerk and assistants were efficient in their role after synchronized data from web report were able to help them acknowledge needs. Also, it helps them manage items in warehouse stock better, know minimum stock requires, and forecast future growth in sales efficiently, as customer walk into store were able to analyzes needs and provide right information regard customers' needs. Although there isn't any promotion from the manufacturer but discounts can be made by certain retail stores. Continuous use of products was seen and enable retailers to efficiently re-stock items correctly in time.

It can be said supply sustainability can create efficient sale continuously and perform in sales increase with promotion performance when customer was happy with the price and they were reluctant to commute to store often. Moreover, clerks were able to give good information to remind customer, this helps in long term sale and product survivability. As profession sales know that sometime selling doesn't have success at first situation but continually reminds can make sale at later time as customer have needs at certain times and they could remember what was repeatedly remind to them. Later, it enables customer to purchase more and promotion can be made from the point of needs later, this also provide sometime for retailers to gather more information of customer future needs. It seems like a demographic population review as aging and illnesses may happen when certain factors and life situation comes into play.

Synchronization data were able to generate data for correct pricing, create efficient sale, it creates sale performance when the price is right and more purchase can be seen when adherence was seen in some customers. It creates organizational performance, as it made internal clerk enable to communicate efficiently, know customer need, and help customer in every way that the needs were fulfilled. It then creates efficient sale promotion that fit customer expenditure and still able to portray supplement in a good way that customer can still re-consider. In turn, this help create brand service impression. Synchronization data from web can help stock management

very well. Clerks can check numbers used efficiently to manage sales, stocking, re-stocking, forecast orders needed, when it can be sold, and what time will profit be made. This enables retail manager to correctly estimate their earnings in each quartile with many sales data that statistic shows illnesses in each demographic area. The acquiring of statistic data in each demographic may varied from retail management to management. Cluster pharmacy retails have share data between clusters using their customer relationship management software at each retail, for example. It maximizes ways to forecast income and make right promotions after. When data were correctly use it can forecast dependability. Profit abilities of mentioned made profits that were non-capital but sees future capital from customer's trust in service-dependability, continual use items procurement at the retail store can help their adherence to endure.

Also, the visit of web system can help customer learn new product within the manufacturer's website, promoting brand trust, and make a good impression on the supplements. Thus, synchronization of web report was efficient in retail management. Synchronization creates resilience by helping clerks and managers to store the items efficiently for current customer and future customer. When management were better visibility was seen to help making profits steadily by assisting in forecast and consumer behavior review. Store clerk was able to finish their job functions faster without having delay from servicing customers. So, it was satisfactory for managers. In some retail setting, customer use from web report wasn't much but it can be part of whole system in franchise setting and cluster retail settings in concluding sale efficiency and performance. This can be better managing data for manufacturer's marketers to see what is going on and how they can become part of help. In synchronization of small cluster retails and franchise, when customer quit their routine use, the items can be re-routed to other retail.

When demographic data taken into account, pricing were set to affordability and it doesn't affect purchasing power and discount promotion that can cause brand problems. Continuous sale was seen in and profits continuously increase in each quartile. Although, in far region, some customer may feel that pricing was barrier for them to continue adherence. This also was important to accommodate future

continuation of re-stocking in some retail. However, future decision in government may help decrease expenditures as certain growing bacopa has been seen.

In summary, synchronization can create adherence to use with convenience. It can build data into take care of scarcity, build sustainability supply chain in single retail and cluster retail. Make clerks aware of self-performance as driven factor in sale promotion and customer care which create resilience through effective communication when customer behavior was known with service and trust built along the way. It also efficiently helps determine where product flows best in which demographic region, so this is important to manufacturer's decision in marketing. This brings consideration to the table that can help plan pricing, logistics, and purchase that can make supply chain sustainable to available customer.

In daily activities, the information from web report was used to manage customer data on a daily and weekly basis. Since the bottles was 60 capsules and consume daily, it was check by clerk daily for adherence which can create detail communication plan with consumer when bring forth what can be done further and enhance use with certain items that can maximize supplements when work together. This promotes sales, customer interaction, and consumer healthiness. Furthermore, product can help in sustaining health so it doesn't get worse. This enable service value along with consumer satisfaction, whole retail, clerk was able to complete their job faster during time throughout the week. Profits can be seen apart from continuous use of first indication. It was promoted for produce healthiness in people who feel weak. With synchronization, the store clerk was rise to finish daily job faster and made themselves available to service customer faster. Adherence was seen in customer when use the web system and keeping an eye on repurchase was the key to verify if truly the supplement was used correctly with the system use as supplement to main routine in store management, it can predict number to store for each customer visit when they come to get more bottles. This help stocking correctly, increase sale through single or cluster performance in retailers. It helps building good brand, good reputation, and good promotion of community health along with economic discounts and satisfaction to community.

The web report if they were put to use effectively and draw customer to attention with more elaboration, it might make a good digital patronage in the future. However, the current use was seen only input to acquire user data information in a daily routine. In the future, if platform was changed it might collect more data and user interaction features can help transform the website into digital patronage. The web report also creates awareness to stimulation clerks to improve their professional acts in performing jobs and help them realize how they can be of help to customer to solve their needs. It also helps clerks sees visibility that they can perform better when they receive information from web report and how to start communicate to sell, to adjust, and adapt market items to suit customer needs. Building experience and value service quality helps build brand loyalty was seen in retail setting. Information web report help forecast supply and demand really good, so it helps create sustainable supply chain when it helps re-orders correctly by inform earlier to see if at the long end of distributor warehouse has any items available.

The web system help track usage and customer behavior and was ablet o make continuous care plans. It helps create good relationship in long term that harbors long term earnings when look towards earnings the income varied throughout but continuous earnings were seen. Performance of single retail store can portray certain points where the business can still survive. It can be telling much better in performance if a demographic area has more user compare to some store that has few users.

Synchronization help build trust from customer on a long term and was able to serve customer in a way that retail store can understand customer when review usage data and discontinued data in some area. It can make continuous data in demographic area if people still use the product. Also, synchronization help retail clerk to communicate better when able to keep promotion with store policy when customer visits. So, it can be said that synchronization make more profits when customers were willing to buy more because of the supplement effectiveness alone causing the adherence data shown in web report. Also, the distance to store is far from their municipal. Some customer had to drive from suburban areas or further to retail store in town to purchase the product.

At the current time for web report system, it can help forecast stock and report customer usage and able to help much better understanding of customer in long term when every factor and behavior shared were taken into consideration and analyze from initial time to current time. Thus, bringing resilience to business and supply chain sustainability in a good way. This happens at points where customer receive good effectiveness from the supplement and continue to use them effectively. Retailers may provide extra supplements to accommodate bacopa to current customer and find new customer to use more, increase current stock need and future refill needs. If there's high population demand for the supplement it will cover the knowledge to determine saturation point for stocking of warehouse items. Also, an awareness to COVID with mental flaws in the current time, may signal the use of bacopa if it can alleviate symptoms in memory deficiencies.

Management prior manufacturing synchronization capabilities data returning from managers in manufacturing showed in congruousness with research hypotheses, using before and after fashioned questionnaires. With the results shown from questionnaires data, the industry was able to use synchronization data to push the marketable items into profitability. There were no errors or problems prone to happening. Machineries were able to perform and achieved manufacturing amount of items according to orders given from retail sector.

Communications with retail customer perform well during the time of synchronization of two quarters. Raw materials acquisition, purchasing, and stocking performs without regards of scarcity during manufacturing of profitable income-making item that the research was used. Manufacturer was able to keep up with items ordered with increasing increments each month when more customers were continuing their products. Performance of the manufacturing line was able to keep up with increase demand and still able to make new marketable items along its competition. In terms of keeping up with new customers and returning customers for the same items, the manufacturer seem to be cautious on items available to manufacture. It might be from the pandemic factor that is a good economic disruption. Also, pending raw materials for multiple manufacturing items that uses

same material can be a crucial factor in making decisions that when expenditure was accounted, it can be bothersome for managers to answer.

Currently, the manufacturer was able to produce correct amount on time, making every customer profitable. Although, managers may seemed a bit worried on machines and an awareness on product booming when economy recovers, so the score on keeping profitability among customers was above average. Also, with the start of raw material farming, the acquisition of raw materials may be continuous but the machines may be weary within the next half decade, enabling some doubts whether if problems could arise from the fact presented.

The stocking of merchandise for retail customer did very well when demands were on the rise, having no problems for deliveirng goods to retailers and distributors. The retailers and distributors were able to stock merchandise on time. Manufacturer was able to produce goods on time and merchandise on the market weren't scarce.

Planning certain tasks was very heavy duty, due to operating many production lines involving herbal items, generics, and supplements. Prioritizing may have unpredictable outcomes, many managers. Although, machine didn't have any problems. Most tasks slowed would be from time management alone. Planning of manufacturing, logistic, and market planning for each quarter were done efficiently. Manufacturing plans were carried out efficiently without consuming much time and energy. Retailers were able to sell goods according to amount merchandise available each quarter, which didn't effect manufacturer's warehousing loads. This means that there's a good amount of work put into the work of merchandise flows without having overstock items that can affect other merchandise that were also crucial in making profits.

Working with high demands on time didn't score much, since metropolitan during working days many people commute with traffic jams. However, logistic to provincial didn't have much problems at all. Although in the future, if manufacturing plant were re-locate in the vicinity of metropolitan, in the outer suburbs this may be advantage to distributing merchandise to further provincial and inner metropolitan



where the commutation through highways would be more convenient when distributing items to distributors in areas with wider roads.

Scoring higher than midline, production planning for new items or newer formula were carefully provisioned with past market planning. So the manufacturing for new merchandise of current items or newer items poses non-risk for manufacturing with scarcity in mind. The process covers planning that if customer increase, the production capacity remains the same. So, it bears the capacity to fulfill customer orders when high amount of goods were on demand. Manufacturer was able to help customer make profits when the product cycle reach its high.

Management of man power and machine were moderately plan when receive orders from customers in retail sectors. When production line are in manufacturing and certain tasks routinely runs simultaneously with many errands to do, somethings may be left out may hinder the ability to calculate certain data that is useful in calculating profitable purchase of raw materials among multiple items that make profits.

On questions provisioning fulfillment of orders on logistics managers feel it might help reducing costs on transports when planning and carrying duties. Also, visibility within manufacturing might be better when forecasting, stocking, re-stocking, and manufacturing efficiently. Manager feel that customer synchronization may help with purchasing department in procuring raw materials sufficiently for production amount required, although not limit to maximizing profits at current time. Visibility among synchronization data may provide enough data for production, marketing, and purchasing of raw materials. Tracking usage data can help with production timing, which helps managers to estimate and prioritize which manufacturing products needs to reach distributors and retailers first for stocking and re-stocking. Also, pandemic crisis affect certain items need to reach market first which causes some concerns on manufacturing capacity.

The tracking of customer seems to be fine and done readily fast with the retailer and distributor. At the current time, the manager hope that using the synchronize data for use would bring more efficiency to the marketing sector. Also, it

may help ease for planning of workers on duty and machine. The manager would use the data for infrastructure of management and visibility of future data use. However, the machines were very efficient in large scale manufacturing but using synchronization would help their production planning faster. Also, it would help with the efficiency of marketing planning. When peneterneting every quarter, volume of sales would be determine and plan for manufacturing efficiency, meaning that if one item is a bit slower in sale, the other items may be plan for tweak numbers in production to keep up with marketing status, reformulation, and forward marketing management planned. When in need of rush manufacturing with making profit and planning, data would be using in product trending, user usage trending, and off-label use of supplements when television of current products and other products may be advised on television and customers asked for products containing such ingredients. Stocking of manufactured products would be visible information that can match customers needs, current usage, and future usage when drawn data from synchronization results to match production needs. Although, stocking on time would be questionable at sometime when there is an increase demand at some point in the future if the COVID-19 pandemic crisis has an outbreak again. However, the logistic was very efficient at the current time. Also, drawbacks in economy, so numbers of future customer and usage may be questionable due to affordability when production cost is still high at first. However, consumer marketability seems to have good forecast in health market share, since there had been some medical news linked COVID and mental illness, concernably memory, mental dullness, and forgetfulness. If proven to help with this COVID cause-illnesses, there might be a room for brahmi or bacopa extract for permanent future uses, like a hit-and-nitch scenario. Similar, to the introductory chapter that mentioned about hit-and-nitch with fast consumable goods.

Increase demand that increase manufacturing raw materials can be better manage through synchronization , right amount of order and planning for efficient production could be able to prepare for any risk of production failure. Although modern manufacturing facility and modern craftsmanship were quite reliable, failures of production may be little on the macinery part but more focus on the power loss and

few retrievable raw material goods other than active ingredients. With the information regarding future use of synchronization, managers feel that it would help better the work flow and communication with retailer and stocking efficiencies in retailer warehouse in conjunction with manufacturer's warehouse clearances. Calculation of resources available may alter production and profitability, where screening in-house jobs to minimize manufacturing cost and maximize production and logistic efficiency can clear stocks faster, reaching retailer and distributor faster, resulting in logistic performance, faster time to consumer. This maximizes time to sell, while leaving manufacture time to plan, manufacture, and market current and existing products. Hence, it will help much if synchronization is put into use.

Any visibility for the system installation such as manufacturer stocking good enable goods for new indications and current indications, when uses shift. This can relief items that may be wash from shelf easily when sale occurs. The visibility from this point may help increase performance in manufacturing where goods sold and track would send information directly to manufacturer in real time, any purchase on extra raw materials in lesser expenditure with more volume would bring profit increase. Decrease expenditure in warehouse, routing time calculation and method of transport would minimize logistic cost, enabling safe cost to manufacturer. This can increase funding for future use, such as secure more raw materials for current items and other items that is also making profits. It is a good profit double deal in everything, if the marketing is right. Finally, visibility would enable new planning for manufacturing, right tactic when demand is increase and profit needs to be guaranteed for market survivability and business resilienceness. Manufacturing is at performance needed in marketing and in-time production for consumer throughout the country. Also, visibility in small town where multiple logistics were in operation, time to reach consumer is also a crucial criteria for adherence.

Efficient planning would bring easier planning to achieve on time delivery and sales at retailer's end point, thereby increase time for future planning. When marketers have time to listen and plan accordingly, a better work quality would bring more efficient thoroughly-planning for manufacturer's vision achieving its business high. When performing task both real time production for planned marketing and

provisioning logistic routes, when less time and traffic jammed is decrease, cost-saving can increase funding for expenditure that can increase profits.

Future marketing still have some doubts whether if machines and timing would be enough for heavy duty continuous process of manufacturing multiple items that needs to rush to market in time. New machines are capable of large production but cleaning and maintenance can be time consuming and concerns is still lies in ability to acquire new raw materials on time and machines at work may require new purchases.

Many feel that forecasting would be achieve from synchronization data enabling to calculate items stocking data, clearance from manufacturer to retailer, enabling to calculate fiscal income and quarterly income more accurately.

Manufacturing was done efficiently in the past and in the current time, even though pandemic hit many years ago haven't accumulate any trouble in manufacturing. Problems arise from machineries may be a little, in-house production defects were only capsule deformities. Power outage can be significant if ever happened. With the move of current manufacturing line to new industrial area in suburbs may hindered new advantage in production and logistics. In the present, manufacturing can be made according to orders and firmly made trusts in retailers. In future demands, when demands change, manufacturing capacity may be limited at some point due to the fact that resilienceness in competitor were also important, when switching brand can raise a question of scarcity in an amount of time. Number of machines can be prepared to deliver amount prepared by current customer usage and forecast adding amount require to fulfill number of bottles need to be at each retailer having existing customer in item usage. The manage felt optimistic about using the synchronization system for future management, in full form or some form that can be sequentially add to the current workflow. At the current time the purchasing department was able to secure raw materials from providers, so market competitiveness is in good action.

Retailer orders were able to bring information for production planning, profits were be able to made from communication with retailers. Performance of

retailer sales were able to make fast profits in past quartile and purchasing department were able to follow along the orders and prevent scarcity from happening. Domestic source and outbound source are vastly available from modernization of trades and commerce, so scarcity would be quite minimal. Commenced from retailers and orders were use to plan manufacturing sequence of which produce first and so on, clearance of stocks from warehouse was taken into account where marketing and logistics were able to perform their duty excellently. Adding synchronization would top the workflow efficiently where visibility can maximize what jobs done and minimize time to be done quickly.

Communications with retailers were quite normal, as accumulation of organized knowledge and efficiency in marketing has normalize existing problems. Utilization of time and resources has been easy all the time. In terms of logistics, the managers were able to plan ahead of time, warehousing and clearance had steady flow. Current management, warehouse manager can work continuously, carrying out orders need to be done when there is emergency of product shortages. Logistic seems to be fine, although there hasn't been any logistic problems in the past, ranging from suburbans to provinces bordering nearby nation. If there is any product shortages and lengthen time to acquire items on retailer's shelf, it might be from retailer's forecast products or sudden shifting that may hindered thinking process to re-stock late. This may happen in small retailer that aren't distributors.

Manufacturer makes continuous profit at moderate level, stocking of goods happened to be one of many goods at warehouse, so cost-minization would happen if there's a huge sale, or alterations made to warehouse system. Although, before the beginning of new year there were large orders seen from distributors. It was relieved by the efficiency of machines and a lot of strategic planning has been done and synchronization was also seen as a tremendous help.

In manufacturing operations, some expenditures tend to be fixed-cost in operation. Although, when it is fixed if calculate in percentage earning ratio to fixed-cost expenditures, profitability seems to outweigh the expenditures. Manufacturing goals were able to achieve during increase in market earnings and customer purchases increase in numbers. The marketing items currently hasn't been to extreme increases



on the usage because it is relatively new to Thai market, although it has been use as traditional medicine for a long time in India. With the modern manufacturing and increase uses of some traditional medicines during COVID pandemic, manufacturer can keep track with production need to reach market on time. With indications other than existing supplement indications that may cause scarcity countrywide, it is still a questionable problem because it doesn't affect only one manufacturer. Also, synchronization was seen as operations that can be use to prepare managements involved and prevents disruptions during market growth and logistics to supply pharmacy retailer and distributors on time.

Marketability of items on market sometimes didn't reach their market goals, so this could not be account for the manufacturing performance and efficiency. Also, at some point some raw materials were expensive, profitabilities were achieved at some quartiles prior last year. With the current economy that was severe by the pandemic, the ability for marketer to push products to market was still questionable, but were subside at the beginning of the year when distributors begin to recover from the economy caused by pandemic and begin large orders of Bacopa Selext from the government manufacturer. The profit gain were able to circulate into making new material purchases and produced items readily for consumers at country scale. The management was able to make efficient planning for production according to market needs, however with the pandemic when economy suffers the forecast of future purchases couldn't be accurately calculate for one item. However, with other items when in need for specific indication of use, marketers can calculate with precise. Information of current sale can produce forecastable flows that can predict income from retailers filing orders for re-stocking their warehouses. With competitors for each items on market share, it is quite hard to predict market share outcome during pandemic still occuring over the past year. Throughout the sizes of retailers, the larger one were more predictable when it comes to re-order, as it can provide smaller retailers with wholesale. This can be seen in far provinces. With the current management, there were no feelings involvement in the decision, all of the processes and management were done using statistics. The current management has been doing fine in the mid stream of production, marketing, warehousing, and logistics. Retail



management and customer relationship had been good through friendly relationship management along the past, when they made sales of pharmaceutical products as well we supplementary products that were best sellers in cosmetic lines.

Management after synchronizations found significant in efficiency and performance change, due to the fact that the scoring from manager have strong management skills and were able to solve problems with planning efficiently with the use of synchronization between consumer, pharmacy retailer, and government manufacturer. Information from customer have useful information in bring efficacy and performance changes in tactics to accomodate present manufacturing and changes in the future to meet market demand. The information help in forecast problem in future market and customer. The procurement of raw materials were done continuously, as to help stocking and estimation of consumer sizes in long term. Resilience was seen in developing good market standings. In forecastability of future market can be seen through synchronization. Where adherence is seen to benefit patients, this means that assurance of continuous use is warrant for a fair amount of time that can be taken into consideration of forecasting ,quartile by quartile. Current re-orders as consumer increases and sustain numbers of supplements available to current customers were seen in efficiencies with information sharing. It was also use to forecast flow of stocks in warehouses, that were synchronized between pharmacy retailer, distributor, and government manufacturer. The information was use for seeing where product is going to consumer a what region. It enables seeing and forecasting demographic growth. Also, prediction on logistic cost is useful to approximate expenditures. Although, the raw material purchase was done continuously. The internal management of production was happily using information as part of forecasting procedure. Synchronization was also relied on, in scheduling and prioritizing jobs involves machines that were set to efficiencies needed for production. So, in the end it reduces time and cost when manage proficiently.

With customer location and demographics, the logistic was able to make better timing, avoid traffic jams, and traffic risk. Although in far provinces, a caeful route of shipment was chosen carefully. At this point the management change in relocation to new suburb areas can help better make things for logistic to perform

better, both in-bound and out-bound routes. With the information from synchronization it will help further logistic efficiency, travel risk, and traffic jams were readily minimized for daily and holiday occasions.

Overall usage of synchronized data can help with current statistics in forecast production, prevent scarcity, manage operations and logistic operation to function with minimal risk. So, when taken all into account information can be used to help pacify operation to run better but not replacing what has been done routinely before.

Future use of synchronization can be used step-by-step to help maximize visibility and look into where it can help perform when the data is lacking planning for production and marketability. So, it can be used to present future flaws in marketing with information visibility presented. Marketability for current and future, with synchronization it can help manufacture to stay in market trend and help understand needs. It helps understand how customer use product and foresee future trends. So, market efficiency can be achieved from this with stocking performance, number available at customer homes can be used in forecast stocking in warehouse, re-route products from retailer to retailer to maximize production that fits market demand. This can be done through usage of data mentioned in market planning with stocking in warehouse with awareness of demographic region needs that product needs to reach, all can be done efficiently just using web report data to complete all work.

With synchronization, the manufacturer can forecast when stocking raw materials to line with agenda in manufacturing, it can efficiently tell the purchasing department to purchase continuous and replenish whenever customer growth demands items in market. Synchronization can correctly approximate amount to be replenish, so customer can benefit from items always available on-shelf and enabling adhere to product usage.

Synchronization can help with market to reach customer and forecast future growth, improving resilience with customer interaction minimizes risk on raw material procurement-ability and stocking productivity. This in turn makes resilience in supply chain. As prediction also helps retail sales whenever information from

customer was presented, in congruence with usage time and continuation or discontinuation from product use. In fact the information from synchronization can provide more information to manufacture to produce product needs, rather than push and pull at retail practice. Many feel more confident in using the synchronization data with current statistics for normal day work and predicting market trends. It tends to be information to grasp for staying on track with resilienceness.

The information accumulate as synchronization data was able to help managers make decisive actions, although the data from using the product is still in its market entry-stage. The data may require more usage on the items when it continually grows with increasing market demand, to prevent downfalls if any part of demographic region has economic instability. When customer feel trust, it would make data more trustful to managers in using it to devise future market plans. Also, with the fact that customer ability to control their usage around the product with digital help, it helps to produce adherence on a daily basis. This enables resilience in business because the machinery is already capable of mass productions. Also, with the input every can create some information for early planning that can be made to secure supply chain continually.

Information from synchronization web report enable many departments to improve their data visibility and share with each other. It changes how managers work to unify their information and knows how to share with ease of use, when integrated into current workflow. This creates improvement in human resources, marketing, and further satisfy customer in the future with action plans that can rise from successful information sharing within the organization. Customer input feeds can help maximize ways for customer to reach order easily through web interaction links and future available resources for customer can be made available to retail and distributor customers in the future.

When synchronization is happening, many improvements can be seen on management level, information receive were useful. Better production visibility enhances management function and more robust. The web information provides information for logistics before sending items off from warehouses. It gives the visibility where the product is reaching its sustain customers rather than just knowing

it ships to be sale. It is shipping towards sustainable use for adherence. The information for future stocking provides information to warehouse management to readily know where it needs to be store, what needs to be done, and when it will ship. The workflow feel better, however if it is within the time that higher demands, warehouse manager feel worrisome whether if large amount of goods can be produce in time if scarcity of raw materials occur. Although, the manufacturing efficiency and performance were achievable by modern machineries. Also, the relocation of manufacturing facility may cause some lag in production, as governmental regulation procedures may take time, if taken into consideration.

The information give visibility that can be use within many departments such as manufacturing, marketing, purchasing, and logistics. It gives visibility for professional use along with statistics data involved in management of business. Within given amount usage total along the subjects within the research, data produce were able to use with planning how many machines would be use and people to work, along with calculation of warehousing and logistic expenditures. Information provide by web among the users can provide information that can be use across retailers, distributors, and manufacturer. It can be use to plan production and logistic on time, also it can provide information for future forecast of user among demographic region where increase number can be use. Which logistic can plan for shipment that can reduce cost through long-term partnership with local shipment company. With the use of information along the marketers, information can be use to secure future markets, for current use and future indication use, information from subjects provides useful information for detailing new indications when ready to make marketable use. Information from daily use can be use to forecast baseline production needs for current customer and still can forecast new customers, when calculate with demographic data that can also be use for calculating logistic shipment expenditures. Information produces on time production and on time customer reach, at retail level. Purchaser of raw materials can make purchase on time and able to procure the warehouse with good amount of raw materials for the current consumer consumption rate, as given by the data. Information from the web enables production planning as it can be use to forecast amount of raw materials need for existing customer, also in

long term use for geriatrics can use data to elaborate market plan if more future use is warrant. Top level managers were able to manage sectors easier with data involved from the web report, using statistics of what is on the table and what can be done further to improve manufacturing and maximize future sales in the next quartiles. Also, with the improvement in mind for warehousing and logistics when certain risks were taken into account for shipping and handling from warehouse to retailers and distributors. Risks were minimize along with synchronize data for manufacturing, stocking, and logistics. Prior the study, there were risk minizations practice with the manufacturer already.

Orders from retailers with synchronize data produces action plan that can present visible data among managers involved, it creates reduction cost in areas that can be minimize when presented in the meetings. Purchasing can use data to prevent overstocking, when the market earnings were affect by pandemic. Information use were more prominent in usage in marketing, production, warehousing, and logistics. Managers were agreed that the data was usable at action-planning level and it can be integrated to improve work functions in production, warehousing, and logistic management. It can be use for securing raw materials that agreed with budget for savings and prevent overstocking. The synchronization made efficiency in production planning in terms of readiness for the future and also made performance in retail and manufacturing communication, as it tightens the gap in the routine relationship. In the time given, manufacturer's performance can be seen in retail orders as more customers increase from retail purchases. However, as economic detrimental from pandemic, overall planning made can give moderate results on savings that brings profits. Within regards to information to customer use, the manufacturer were able to use data to provide efficient plan for all tasks involved and made savings from purchasing and manufacturing. Purchasing can make forecast so that raw material are ready on time, with communication stage by stage, in synchronizing with daily use and forecast future use. This make productionn easier and from continuum of usage may help product growth in the future. Efficient planning can be estimate for machine usage time within the agenda, proves radiness for the time management and productivity. What may rise from the usage of visible data is it prepare machine and



product readiness when there's an increase in usage. It improves readiness, which prepares for resilience when the product booming begins. This also helps prepare the manufacturer for what is coming in terms of readiness, warehouse racks, machine involves, temperature and moisture control, and so on.

When synchronized, the efficacy in storing and moving is better to accommodate fast consumable fashion. It also decrease risk in logistics, as risk among working and information need to be share to achieve work goals.

As summarize in prior synchronization the result was better when uses synchronization to maximize work and efficiency to bring save cost and increase profit, meaning manager agrees to result as it increase visibility and improves professional performance, when refer data and outcome. Also, the raw materials were able to procure accurately inconjunction to profitable sales within each quartile.

Managers were all agreed to synchronization that help increase efficacy in manufacturing operations and profits were seen continually from increase customer of Bacopa Selext. It can maximize production planning to fit future needs and bring profit together with production cost reduction when in times of predictable re-order and predictable re-order that bring more profit during one quartile. Manufacturing plan is more robust, when usage visibility is more visible when synchronize. Managers were able to use future needs to make production amount requirement while making budget saving with worker and machines involved.

Management of people is easier and information present for each retailer with customer usage data can make forecast in production and profit easier, it delivers producto customer faster in a n expenditure reduction way. Also, data can be use to approximate customer loyalty, this also helps in forecast future sales data, whend uration of usage is continuous. Delivers of all produced item were on0time for each re-order from retailors. When products are in continuous sale, communication between retailer seems to be more responsive and cooperative. This helps strengthen relationship between retailer and manufacturer. More consumer trust as everything is visibile while retailer made long term commitment to customers. So, for all of this the market long term is visible. Synchronization enable manufacturer to foresee customer

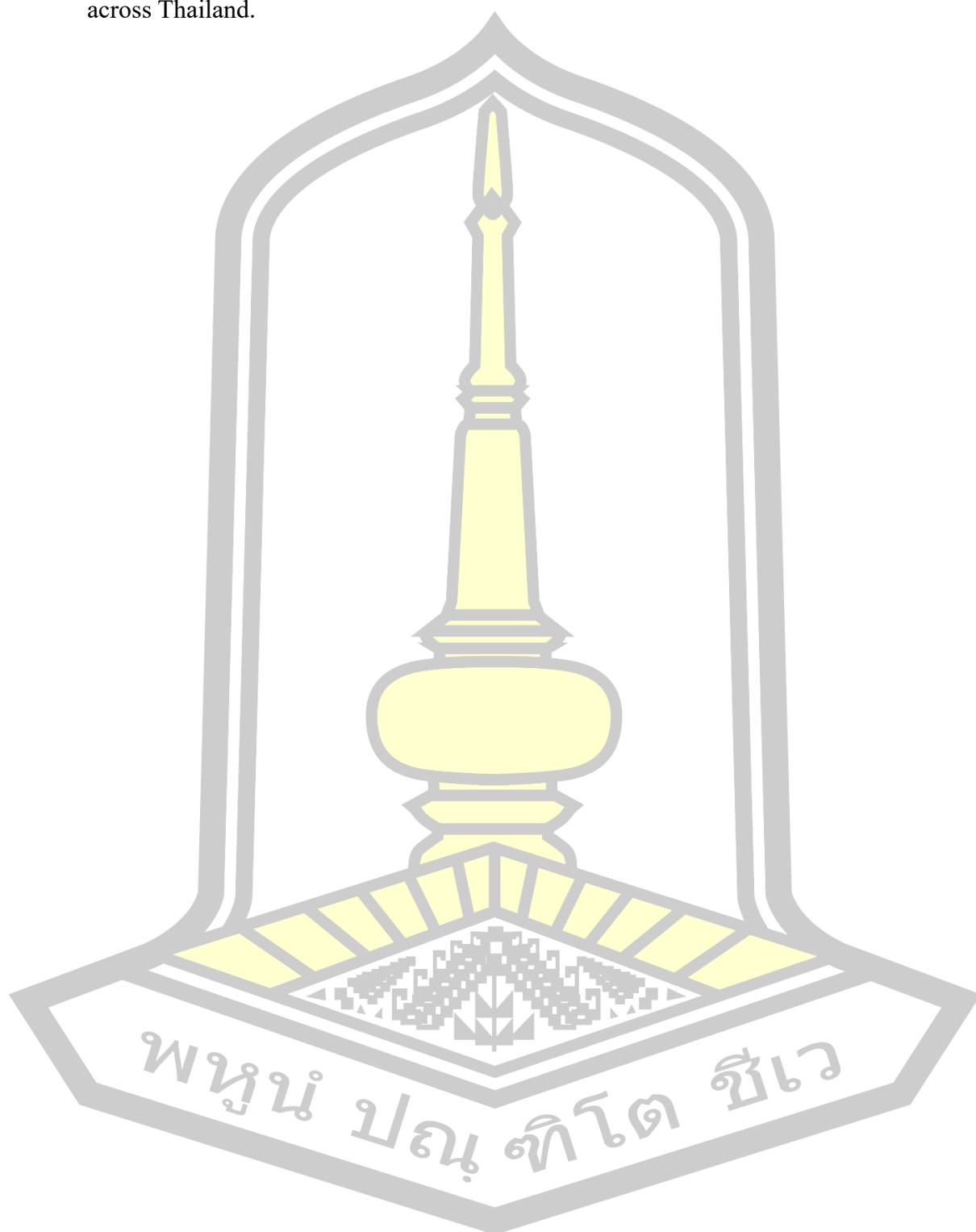


data and make right approximation for management that would evolve around them, in order to make customer loyal and business resilience. This can be seen that business were evolved around demographic region and statistic analysis manner. This made planning easier better than prior synchronization and manager starts to see changes in stocking management and logistics in a good way. It also helps in aware of risk that may happen in the future also, it also stimulate marketers to think about future use of active ingredient if future studies on product warrants future use continuously and there are several things need to be done to assure quality, customer value, and market share competitiveness in long term. This is similar to other herbal supplements that requires the same evaluation in long term.

As to efficiency and production, the manufacturer is readily for future productions because scoring doesn't change. So this prompts the readiness for future hit-n-nitch scenario. Manufacturer performance and efficacy is ready for future market attainability and growth, the customer usage from the web report. Synchronization can manage warehouse stock efficiently, it increase manufacturing performance and warehouse performance when orders increase meaning that the manufacturer was able to keep up with market increase without needing more capitalization into purchase more machines for efficiency of production. Hence, the manufacturer is ready for mass production effectively, leading to long term resilience. While this happens, it can also decrease overall expenses when pre-planning can be made and re-made simultaneously when manufacturing multiple products at the manufacturing site. The unchange factors that managers didn't change was the raw materials acquisition, as prices may alter unexpectedly. Although, many purchas tactics can be prepare to guaranteed the acquisition prior high prices can occur and also the government plantation of bacopa can bring changes to control pricing of raw materials seller. This means that a minimal pricing of future bacopa can be lesser than current time and price won't be high when in need.

Lastly, for performances and manufacturing efficiencies it could be said that it might be the same, as machines were ready for mass production of goods to meet market demand in time. It can readily accept orders and begin to forecast and produce enough for each quartile. So, all of this summarizes the efficiencies of

synchronization in government organizations with retailer and distributors in regions across Thailand.



## CHAPTER V

### CONCLUSION

For all hypotheses in group 1 and group 2, it can be seen that multiple regression shows significance for all variables and conclude that all multiple independence variables affect dependent variables with significance in Multiple Regression Score and have strong Pearson's Correlation Score. Also, ANOVA in every hypothesis's items have statistics shows significance score of 0.000 for all hypotheses in the study.

It can be concluded that all independent variables in both groups were affected by their multiple independent variables with significance a-value less than 0.01. The  $R^2$  in all hypothesis's test were found to be at moderate level, except for only one hypothesis with  $R^2$  value of 0.866 that was found to be high level, in Retail Order Fulfillment Affects Efficient Logistic Operation.

The Pearson's correlation statistical value in each hypotheses were found to be moderate; their corresponding coefficients' significant value were found to be significant at less than 0.01 level. So, this can be concluded that all were acceptable.

For all interviews, it can be concluded that this research was a pioneer in synchronization for food supplement that has long term use indications, through utilizing information technology as tool for management of supply chain. In the future a larger scale can be conduct to understand more on synchronizations. As this study was limited to its size and funding. The future would be bringing more challenges to the manufacturer and distributor, if more consumer would be available in the future for synchronization study. Also, with the operation of information technology expenditures in mind for the retailers, it might not be too much if data is more valuable in long term healthcare. As information technology infrastructure has proven in customer care efficiency, in this study. It is a good way to spend funding into information technology for consumer management, since it eases supply chain management and improves visibility for many business operations functions.

In customer behavior research prior using IT system to handle customer synchronization. The pricing of bacopa extract was seen as affordable among the wage group from low to high. The price was countrywide affordable and available from retail to retail that has bacopa customer. This means that continuation of bacopa extract can be continue anywhere within country of Thailand and the price is the same throughout. This add the resilienceness to business and adherence for the better of consumer health. From this point it proves useful of synchronization involving customer, retail, and manufacturing for the business operation of retail success in consumer market.

From many points of research, it can be concluded that manufacturer had strong skills in management. Workers and managers were able to keep up with manufacturing, marketing, raw material procurement, and achieve supply chain sustainability at some point. However, with the growing needs, if there is a booming point where shortages of raw material may occur, it is still questionable. Although, the semi-raw materials were readily made at the center, so raw materials need for making extracts would be easy to find in given amount of time.

In this study, the research found very well adhere to use of GPO Bacopa extract, which may provide future research that can prove lessen hospital stay or prolong good health condition, when customers were informed with quality care. This involves in neurological disorders or conditions that can prevent future hospital stays in people with neurological conditions. Which may have findings similar to Gibson et al, (2011) and Zhang et al, (2010). Long term usage that can lengthen good mental health may find similar in better regional economic studies that came from lessen hospital stay from mental deteriorations, can be link to using long term Bacopa extracts that were found in studies from Philips and colleagues, in usage of beta-blockers in prevention of cardiovascular outcomes. Also, the benefit of bacopa extract may also prevent other neurological conditions that is related to fatigue, stamina, and fragile movement. This can be found in studies that Clark et al, (2000), on chronic conditions as progression towards other disease. Although, it had been studied earlier in GPO Bacopa extract on neurological improvements towards musculoskeletal movement. As a result, this can save money for regional and provincial that may have

more elder population in the future. With future more raw materials available to government manufacturing sector through the Chakri Royal Programs, this may provide cheaper marketable supplements towards elder with low-income that may be barrier to adherence, as studied by Ssewamala et al, (2019).

Research findings in this study digress Kalogiani, (2011) that mention multidimensional roles of 5 key factors in adherence, although did not mention about economy related. This study finds that pricing and promotion has strong evidence for continuous adherence, which adds key information to solving long term adherences towards using supplement and may be important to future adherence in drugs. The research finds that pricing and promotions does affect long term use when item has efficacy, findings were similar to socioeconomic factors in Koop, (2005). In this research, there weren't any protocols that is similar to Chia, 2008 research but outcomes show the same effectiveness. With the long-term efficacy and effectiveness of Bacopa extract have confirm long term adherence to be relevant to findings, digress with Mohiuddin, 2019 that also looks forward into correcting poor adherence through safety, distant, and toxicities factors.

Research in this finding found that cost of item has effect on consumer adherence, more purchase was seen when the price is low and continuous purchase were done through low price offer. The research led by Mamaghani et al, (2019) and Viswanathan et al, (2012) have same findings. Service after sale in terms of counseling also have impact on long term adherence. Although findings led by McGuire, (2014) that looks further than Choudry et al., (2011) only shows 6% increase but in this study, findings show 23.5 % increase in long term adherence when counseling was done thoroughly.

For the first key factor, Mamaghani et al, 2019 and this research had the same outcome that cost was first barrier to adherence, although accessibility seems not to be problem. It can be seen that in out-town setting Thai people have habits of frugality and getting things they want through people going to town. So, people they know can buy for them instead of going to town themselves. Literacy rate did not have effect on long term use on this item rather understood what was said and fulfill effectiveness seems to be the key role. Key finding in this research shows same result with Carew

et al, (2017) that right price can attract customer to retail and web channel. In comparison with Zain and Saidu, 2015 study that said 30% lower price seems to be satisfactory, in this study retailer's brand at 22% reduction price seems to be satisfactory at significant level. Findings of quality and brand trust, research shows data that correlates to Xhema et al, (2018) in item quality that maintains reputation. Although studied for 6 months, much time would be required if one would want to study adherence that can prevent hospitalization from chronic health, similar to Sokol et al, (2005). This would entirely be new study if long term usage can prevent neurological and neuro-musculoskeletal diseases.

With the 2<sup>nd</sup> key factor in cost-adhere the cost of supplement was affordable, with the price range no more expensive than an average American breakfast meal in metropolitan, around \$10. And the bottle would stay for 2 months when taken every day. With the low-wage income could still afford the supplements for long term adherence, so this would exempt the studies by Law et al, (2012) and Gupta et al, (2018).

Although, this study has use former technology than word press, but it can find its way into SoC systems that has low computing power, similar to technologies use in former research studies in Africa. During the time was in progression of walk-net into internet. Although current technologies many companies have invest into small low-power SoC that use microcode to save power and maximize server functions. A more efficient HTML-base system can derive from this model of synchronization and give new system to Enterprise Management System, which can be made into Kiosk that can be connect to Cloud-based Enterprise level Backup, Tape Backup, Storage HDDs server, or Local SANs system if available. When taken into consideration with adherence review by Desai et al, (2014) that utilizes larger programs that requires more extensive use of servers in large scale. This study uses smaller systems that can be change into smaller systems that can fit into SoC servers with low power system. This can minimize costs on start-ups and large-scale government corporation. So, social network, online forums, blogs, casts, YouTube or similar technologies would be useful in larger computer cluster systems that were



describe by Desai et al, (2014) and proven useful in medication usage, Broder et al, (2019).

Also to be include is that AI system can be include in the future for use with business analytics in real time. Healthcare trends can be extract from social network, business network, news network, and research networks. With trends information input into AI system can maximize customer health needs and be able to formulate new pills, according to new health needs can be done. This can be done when simply counseling with customer by asking current supplements and new health needs. The power of synchronization is that when new needs become a trend of needs, manufacturer can make use of some materials that wasn't use for quite some time or re-formulate to fit new customer needs so it fits their physical stamina and prevent chronic conditions that deteriorate health.

With AI integration into retail sector, will enable real-time analysis of consumer behavior through current purchases and continuous purchases, this can give new topic in research that will enable researcher to understand more about consumer choice selection and shifting cost that can alter how group of business in same sector interact and respond to consumer behavior at large scale.

In terms of long-term adherence, with multiple months refill at a time by Taitel, (2012) the cost-adherence seems to show good results. This help solve the needs conclude by Gomes et al, (2019) and Halland et al, (2020), that there were needs to make strategies for adherence via cost reduction. The cost reduction was done through increase purchase that minimize cost for 3 months. Same pattern can also be seen in this study when patients or people at home make multiple bottle purchases so they don't have to waste time to buy repeatedly. This make sense because living in metropolitan most time were wasted on traffic jams. This also find that long term usage was met through multiple item purchase. Also, in large family there were 20 bottles promotion at the website for purchase for large family.

Adherence obtain in this study have similar findings to Gomes, (2019) and Jimmy and Jose, (2011) when retail pharmacist and clerks can check from the system and make collaboration effort with customer to improve adherence. Through making

schedules, follow ups, and assess adherence. Concerns with poverty on non-adherence were null in this study, since low-wage income does not affect power to purchase in long term usage, this means that studies in most modernized country in findings of Mojtabai and Olfson, (2003) have no effect in Thailand country wide.

In the study, many patients were on multiple medications and have no problems with using extract, consumer adherence were seen when using the web system and also some medications taken together were also seen to adhere when taken together at the same time of the day, when the pill isn't missed. Direct communications at retail and counseling were made and findings were successful according to suggestions in Inamdar et al, (2013). Compliance to adhere were similar in ABC Taxonomy, 1<sup>st</sup> – 3<sup>rd</sup> stage assessment in Menditto et al, (2020). In simplification, the first involve first pill taken correctly, 2<sup>nd</sup> was to assess if disease can be control taking extra pill, and 3<sup>rd</sup> if dose and long-term use were continued successfully.

In 3<sup>rd</sup> key factor, retail practices in helping customer to use pill correctly were similar to coaching study of Willard-Grace et al, (2020) which showed to require extensive amount of time on each consumer, thus bringing adherence long term. Awareness was the key to remember taking was a good indication of adherence, Fukuda, (2020). This study also found out that awareness being part of program study may also be one of the factors that drives awareness that was the key to remember taking correctly. The study shows similar result with Hashim et al, 2018 and ADIEHTA Group in Guirado, (2010) that adherence was correlate with knowledge increase. Although this study, looks further into dimension of perception, cognition, and benefits of product use in short term and long term that shows persistence in long term use. In similar way of taking drugs, if persistent more than 3 months is a verification point that disease is chronic. Such findings were key point in verifying effectiveness and patient confidence in supplement use which prove the importance of identifying key barriers and solve problems, similar in Lycett et al, (2018) findings. Also, severity in chronic conditions shows knowledge, perceive benefits, and thorough counsel shows perception importance similar in Orimo et al, (2017).

Adje et. Al, (2020) found that education on disease and drug benefit increases adherence, this is also seen the same in this research, where disease severity and less missed dose seem to have same accounts within research, which led to increase adherence without barrier in psycho-emotional state. The impact of this can eliminate low adherence of customer behavior from first purchase with counsel and findings were similar to Lissaker et. Al, (2017). Counseling on benefits of long term improves adherence and impression on effectiveness helps minimize forgetfulness, findings in this research were similar to Alzahrani et.al, (2019) and furthermore when maximizing training of clerks, the effectiveness of communication may solve problems state in research by Shilbayeh et. al, (2017). When more time spent on the effectiveness and safety of use with knowledge assessment from customer eliminates problems found in Farsad et. al, (2018), Hashemi et al, (2015), and Khodaveisi et al, (2019).

Findings in Jankowska-Polanska et al, (2016) and da Silva Barreto et al, (2014) conclude that higher knowledge in disease improves adherence when deterioration brings awareness, this seems to digress with the findings in this research that severity from self-awareness seems to have higher intake score that solves forgetfulness. Also, when counsel with the retailer's clerk and pharmacist improves of condition outcomes were observed with efficacy presented with customers, similar to findings in research done by Giner-Soriano et al, (2020).

From the research findings, the self-education and consumer counsel did not have any difference and consumer with higher knowledge in disease did not have any difference on adherence score from low education consumer, when retail counsel were effective in communication. Meaning that although elderly who need care from family members that were amongst teenage years, did not have problems in helping elderly to take medicine and understood elder care with regimen taken. The patient education and counsel similar to Mandpe et al, (2014) and Ferdinand et al, (2017) have same findings with this research that improve adherence helps control conditions when continual visits show continual better mental results. More adherence was seen with consumer with self-aware of condition risks, supplement benefits, and long-term use. Self-report knowledge according to health condition did not have problems

similar to Ho et al, 2003 when patient cognition may not provide right answer, leading to wrong interpretations, Zueger et al, (2020). Effective counsel was aware with education level and receives satisfaction from consumer, and adherence rate were similar to research by Ferreira, (2019). Similarly, the role function of consumer whom taken that were in managerial position seems to have adherence score similar to Al-Hajje et al, (2015) that state active decision makers have more adherence score. Although this study, consumers that weren't managerial were also adhere to use by many factors. Satisfaction towards retail service also shows continual visits that leads to sale performance resulting from effective counseling, monitoring, and service that agrees with Awan et al, (2015) that loyal comes from good customer service and leads to customer retention, also more opportunities for selling other items may be available in the future, similar to Chopra, (2014) research.

On 4<sup>th</sup> factor, promotion analysis in the retail sector there were discount promotions available when purchase through retailer's decision on pricing, this gives good adherence at a significant level, similar to Milner and Furnam, (2017) done on responses and feedback, also it digresses with satisfaction studies by Zakaria et al, (2013). Although, it doesn't have any coupons or vouchers, there were sales in web retail that has promotion on many bottle purchases, that were fit for large families with many elderly. Retail customers experience study in this research were comparable to research done by Naylor et al, (2018), Grewal et al, (2009), and Verhoef et al, (2009). Although, the research was done using multiple regression, when Naylor focuses on MANOVA analysis. The dimensional analysis in this research model were similar to dimensions in SERVQUAL method that leads to understanding of consumer behavior. Although, some dimensions were focus further on customer reach on supplement, behavior, self-care, socioeconomic, conditions, future needs, and ableness to continue purchase during monetary inflation. The findings of enjoyable service from questionnaires were similar to Saadeh, (2019), where consumer satisfaction was happy with retail service for discounts, retail promotions, education, and counseling.

Consumer care and follow up benefit from web system enable to check adherence this was seen similar to Riekert et al, (2014) when relationship between

consumer and retailer can improve adherence through interaction. Web system serve as one of relationship with further interaction with each other through IT use, proves effectiveness in increasing adherence.

In the 5<sup>th</sup> key of counseling and education, the relationship between healthcare giver and consumer when in good relationship in provide care service, adherence was higher with satisfaction level increase with service similar to Riekert et al, (2014) when attentive customer has higher success rate of communication that eliminate adherence barrier. When counseling properly, the purchase price seems to not have any effect on purchase decision, that were former problems in original drugs when first hit market, when consumer was population in large cities. In price perception the supplement score very good satisfactory with significance. When given strategy of retailers in effective sale, the profits made were continual and satisfactory to managers and manufacturers, similar to findings of Ailawadi et al, (2009). The price was reachable by many people with low income, so it could be said that future hit-and-nitch can be obtainable, with Royal Chakri help on future plantations that can help lessen raw material cost in future governmental production. This would digress with Hoskins, (2020) studies on wide attention consumer and advertisements, when pricing decreases to obtainable reach to consumer goods at fast consumables level.

6<sup>th</sup> Key on benefits of supplements research in this study shows similar result with Triharini et al, (2018) when family support was also help in adherence in showing family care and supportiveness. Retail visit was satisfactory with customer feedback within research, scoring was similar to Grewal and Roggeveen, (2020) but in focuses deeper in understanding, psycho emotional, and resultant adherence behavior, this can be comparable to their study on customer experience as a journey. With perceive benefits and with long term use of bacopa extract, further study may be done to find correlation on lengthen the time to hospitalization and white coat adherence may be sort into pave way for new marketable items for conditions relating to neurological and neuro-musculoskeletal conditions. New research may be start and use models similar to Schulpen and van den Brandt, (2020). With self-knowledge of benefits, consumer with “I know what can help me” or self-referred individual seems to be adhered to use for long term commitment, this digress with Arndt et al, (2020).



When taken 1 through 6 keys into consideration, it can be concluded that there were many multifactorial dimensions that governs retail success. This study shows further dimension in cost, promotion, benefits, and adherence that describes perimeter dimension of SERVQUAL model. Research that was in their prime that needs further research, some information can be obtain from this research for referencing and confidence in field work. In a statistical way, other means of statistic work can be done to achieve understanding of consumer behavior that affects retail and manufacturing sector.

In retail setting, the use of web-based system for consumer tracking found that information from web system can be used for accurate prediction of re-order retail items of interest, similar to findings of Pereiras et al, (2018). It can be used to maximize prediction more accurately when use with current statistical analysis system for prediction. Information visibility from the web system have more confidence with re-stocking that sees customer-centric needs, preventing from overstocking and return unsellable goods, similar to findings of Mishra and Vishvas, (2016) that focus on customer to drive retail success out of subprime economic bubble. Also, customer satisfactory in retail can become a business that can harness culture, what this means is that retail that has their own goods, when first perceive as cost-saving practice, can become a culture of people and a community who use the same products and services. In same meaning, it means that the product and service can be portray similar to fashion industry when coined “couture” that leverages consumer feeling as they are special part of something. A higher service received and mannered towards consumer that demands reputation. This is what drives organizational excellence that increases business prize that increases marketable values of retail service. This shows the importance of work by Ting, (2014) on switching cost that were related to customer mind cost and satisfaction.

Information purchase at retail can predict and forecast purchase by using web-based system to forecast selling when adherence and effectiveness was key to continuous purchase, this proves that synchronization collaboration is important in retail operation, similar to research by Pereira and Frazzon, (2019). With digital information technology, summarize visibility can solve problems in stocking and re-



stocking for sale within regional that is also country wide when scatter by region, the web base system solves prediction needs and fulfill customer product availability on shelf readily. Similar research in market and supply chain management was done by Fang and Yuan, (2019), however this research done in real-time seems to solve their mention problem that were visible in their study. The information from web-based download in excel format readily for use with forecasting and prediction when customer visit was not predictable in case, they were not in chronic disease that require visits with pharmacist schedule for consultation. Web-based system was used in conjunction with R statistic for linear regression for promotion and retail visits. Preference and Choice can be predict using traditional conjoint analysis and spine chart, later it may be generated as input for AI software or AI on chip such as in IBM z16 series. This can make a day faster for many businesses and stay ahead of time in business competition. Market basket analysis can be used for selection of goods. Economic data in regional status can use functions available in library. With this information operation management can also be use in scheduling worker, using function such as grid queueing, lpSolve and lubridate in R Statistics. Programmable library in R can solve many topics, many future works can be done for analyzing customer perception on label and supplement data that can be further analyze for brand perception and confidence. This is important for future brand awareness, advertisement, and brand value, pave way for brand culture. Shifting cost and needs can be analyse by using in set library function, simple difference, regression difference, word analyze, logistic regression, random forest, and so on. Winning, Brand, and Price can also be solve using R statistics.

Retail studies in this research had good service and continuous training to help workers work efficiently and preventing service recovery, there were no problems defined when intercultural customer visits for service, good findings in this research were in accordance with Ihtiyar, Ahmad, and Baroto, (2013).

With digitization of IT system for adherence tracking, could be comparable to Blut et al, (2018) for patronage that sees customer as part of their life journey. In near future, when computer technology reach the point where AI replaces human, platforms like Metaverse would become a future of digital patronage, meaning digital

innovation is part of consumer life and visit every day. When it comes to information processing for retail sector, one could go for low power SoC or stay the same in current technological infrastructure offer by many digital platform companies. However, with future work in SoC base lower power server, could be seen for IT cost sustainability in infrastructure in the future when green technology like solar power is available as cheaper alternative for green business. With finding in this web-base system can give new ways for managers to decide future type of IT use that can maximize profit gains while maintaining efficiency in retail performance that is competitive in the future, similar to Kim and Richarme, (2009) on service operation efficiency can increase profit gains. Gaining in this could mean profit, service value, business value, and organizational value. When understanding this type of profit gain one can see that stakeholders in business that share profits from customer rely on many types of performance that ensures their investment. This digresses with research done by Martin et al, (2020) that sees the importance of business operations.

With retail success through using web-based tracking, customer perceive digital tools as something that can convenience their life furthermore increasing customer trust in service, which digress in findings in Grewal et al, (2017). Information transparencies in synchronization in this study solves problems in strategic planning when managers need to make decisions in future sale, according to population demographic study with statistical results from the past. This digress with Vallandingham et al, (2018) that digital technology make business more dynamic and flexible and strategic planning with web base were opt for better judgement on supply chain forecasting for customer with needs, similar to Eksoz et al, (2019). It also increases trust partnership that products will be available for them on time. In the future, when tracking become more important for use, researcher can apply blockchain strategies into information technology that can leverage security and individuality of information when apply to many businesses sector involved with food supplements. It can be use in logistic traceability like in Behnke and Janssen, (2020) research and supply chain traceability research by Casino et al, (2019). The study in this research serves as a primer of information on what can be done further to evolve

into blockchain technology that can provide better system for business sector and consumer service that needs blockchain for security, information, and logistics.

Time base studied by Badea et al, (2014) have performance comparable to this study, logistics were on time and problems from traffic jams were solve by changing route and time of day during weekly operation. The supply chain performance has no problems in delivering goods on time. Visibility of information provide by web-bas system helps work synchronization better, this digresses with study in Salmela, Happonen, and Huiskonen, (2012). Also, the information visibility serves as confidence factor that items were sellable continuously and eases forecast problems when met with statistics relate to demographic population in area that it is sellable. Also, demographic may show how health problems may rise from living in such area. This can solve problems seen in research by Kembro, Naslund, and Olhager, 2017 involving information-lack visibility that create difficulties in work operation that affects forecast, supply chain, and emphasizing groups of information may be important to each other. Information transparencies can be work furthermore into brand supplementary when entering investor market. It can serve as a good information portfolio to investors if ever an organization would enter stock market to start their domestic or global business. This is also an important subject to search further similar to findings of Schwaiger, Kirchler, Lindner, and Weitzel, (2019).

The web-based system serve as good tool for decision making level similar to Ivanov study in 2020. During the time of COVID pandemic many companies struggle and find difficulties in resilienceness, Sharma, Adhikary, and Borah (2020). Although the use of web-base for supply chain synchronization had provide pills used to approximate retail stocking, warehouse stocking on both sides, raw material stocking, manufacturing, and logistics, had proven resilienceness for the manufacturer part. More source for performance can be look in literature review by Oliveira, Taki, Sousa, and Salimi, (2019).

The web-based system serves as information transparent tool for retailer and manufactur and sort in personalize information when process by workers within the headquarter, similar to work by Wan, Zhan, and Wan, (2011) and Hartin et al, (2019). It creates good service to customers and make experience satisfactory similar to

findings in Tyrvainen, Karjaluoto, and Saarijarvi, (2020). Visibility from web-based brings advantage to manufacturing and logistic in term of preventing disruptions and risk, when evaluated has same outcome similar to gualandris,Klassen, Vachon, and Kalschmidt, (2015). Also, the ability to get things done quickly has same outcome like Connor, Lowry, and Treiblmaier, (2020). Further work can be done from this into cyber security area such as work done by Boiko, Shdryk, and Boko, (2018). This would be very helpful in large manufacturer that requires prevention of cyber-attacks when business security is at risk. The use of web-based bring improvements similar to Shao et al, (2021) and Tseng, Wu, and Nguyen, (2011). The outcome was customer satisfactory was quite good and performance between operations were doing very well through strategic planning, and categories among research criteria were similar to work done by Inaam et al, (2016). Among conveniency in training, managers were more into socializing and interacting with worker to see if people at work understood information correctly, so assessment similar to work done by Plannger et al, (2020) with video-recoding were not available as discussion data.

Visibility and collaboration of knowledge was the key in operation, Huabg, Kanitgem, Benaben, (2017) and Haus-Reve, Fitjar, and Rodrigues-Pose, (2019) found same meaning, latter Kang and Hwang, (2017) found that measures planning together helps collaboration easier. This finding was similar in this research finding that working together in collaboration can make decisions faster and information reliability from web-base was enough for strategic management found in field work similar to Marinagi, Trivellas, and Reklitis, (2015). Information technology use in this study was enough for information sharing that increases performance and effectiveness of operations that has similar result to Kocoglu, Imamoglu, Ince, and Keskin, (2011). It helps see vision together with managers in retail and manufacturer in control of operations and sustaining outcome of organization performance. Outcome of this study did not have problems that were internal and external barriers like in research done by Alzawawi, (2014), although the visioning and improve work done was seen as stress by research done by Halil, Mohammed, Mahbub, Shukur, (2016).

Synchronization in this study found similar efficiency in research done by Schuh et al, (2019) which eliminates manufacturer's failures before reaching warehouse and shelf stocking.

In terms of logistics, the traceability of items sent were emphasize by work of Germani et al,(2015) and Jarett, yang, and Pagliusi, (2020). The web-based provide traceability of pill usage information and logistic were successful in continuation of their job function.

Assessing organization performance in manufacturing sector found synchronization were helpful among departments, when collaboration dimensions were important to business functioning. The findings in this research found that the organization had very good strength in manufacturing and logistics weren't problems because it is near each other for delivering goods to stores. Although, in the future moving to suburbs of Bangkok may improve logistic in much better way.

Planning of logistic functions together in synchronization have efficacy in sustainability of supply chain similar to Invanov and Dolgui, (2019) and stage of management when work in congruence can hinder success similar in findings of Al-Husain and Khorramshahgol, (2020). Although dynamic strategies in supply management shown in efficacy by managers help clarify what needs to be done to workers, this simplifies operations that sees in framework done by Masteika and Cepinskis, (2015). This confirms that dynamic strategies planning help reduce operation, prevent risk and disruptions. Logistic strategies were done on calculation of transport cost and supply chain synchronization, when and time ready for sending products to restock was calculate on a statistical and web-based helps in determining final outcome of bottles to be sent. Meaning that if demographic usage doesn't change due to people moving from jobs to jobs and there is no decrease in population, this can finalize number of bottles to be sent with newer customer in mind, similar to save-cost operations in work done by Peceny, Mesko, Kampf, and Gasparik, (2020). In the future if green technology were use in transportation, future work can be comparable to Fan, Xu, Zou, and Bai, 2018 and Tay, Raman, Azia, and Sidek, (2015).



Operation management planning strategies were having operations similar to Heutmann and Schmitt, (2019) that were observable within this study and guidelines were visible similar to work done by Monostori, (2018) for supply chain robustness. This creates efficiency in production performance when it comes to market needs and expansion when demand increase. In terms of retailer relationship, synchronization in this study have same impact found in Matsui, 2020 and logistic performance was seen to deliver goods on time, readiness to sell was similar to findings of Lftifi and Gharbi, (2015) and McKenzie et al, (2011). Functioning together help makes process go faster and improves efficiency for next job function that can hinder current function in next logistics. Synchronization also helps grow new retail partners and increase save-cost and operation success in local and regional partners similar to work done by Lau, Ng, and Tan, (2014). Synchronization in manufacturing logistic had performance similar to research done by Schmidt, Maier, and Hartel, (2019), findings were elimination of small risks that can hinder failure in logistics. Work seen in this study was seen through listening to traffic radio and stay up to news flash in local area, traffic towards logistic pick-up points, and traffic back to manufacturer. This was effectively seen in partial addition to whole logistic operation that can eliminate faults in operation.

The aims of study on consumer adherence that helps supply chain synchronization, shows increase in pharmacy retail sector, distribution, and government manufacturing sector. When supply chains were synchronized and optimized effectively through managing the problems by tailoring and improving some parts of business operation, continuous increase in profits can be seen from long term Bacopa Selext use. Not only profits from raising capital income are earned but also how consumer value the business and earning consumer's trust.

In mentioned findings, it can be summarized that information technology seen in this study can prove that customer adherence can be shown from 6-dimension approach, regarding cost, satisfaction, knowledge and perception, promotion, counseling, and perceive benefits. It has shown beneficial to retailer and manufacturer when it comes to consumer adherence that hinders continual profits from retailer and manufacturer. It can be further process to maximize job functions and financial



portfolio can be made to help business function and growth in the future.

Sale efficiency can be seen through synchronization of information sharing between customer, retailer, and manufacturer. With more effective communication in continual service, it helps create customer-retailer relationship that hinders business success and ability to grow into culture business that later can become sort of couture that many customers tend to seek, similar to business that has culture like most fashion brands and electronic brands that were seen in many advertisements. Although reaching that point would have to reduce cost from supplements into fast consumables, which later may be done through help of Royal Chakri help in agricultural sector that were seen developing three years earlier. It is seen in this research that currently; the customer was able to mature with the business intact with synchronization that enables customer interaction through web-based tracking service.

Operations efficiency and performances can be seen in retail and manufacturing with strategic planning were able to produce goods in time and able to keep up with market demand when it rises. Baseline operations were secured from faults minimization and output to market functions can be maximizing by operational strategy management and real time evaluation for future efficiencies. Operations on retail stocking and warehousing of retailer were very effective in performance, it can deliver items to customer on time and on-shelf. Web purchasers were able to order online and receive by couriers on exact date approximate. Profit increase was seen in cost-saving, process minimization strategies, sale and promotion efficiency, and sale performances. Target goals were reach during each quarter according to manufacturer and retailer managers market planning.

Manufacturing efficiencies and performances were seen in manufacturing, raw material procurement, lower logistic cost, reliable purchase and manufacturing forecast, in-house production of processed raw materials, and supply chain sustainability can be seen from successful warehouse and logistic operations. Assessment of warehouse operation efficiencies provides efficiencies to retail stocking and flows to customers was successful. Logistic operations have no problems and finished products were sent in success continually. All of the warehouse and logistic optimization in efficiencies and performance were very good. The logistic work was done and plan according to different time in a year, optimization of logistic

according to weekend and national holidays were also in strategic planning for logistic optimization. This benefit logistic operations for storage of retail goods in warehouses. It can be seen that stocks of goods were available in retail shelf when customers visit, also efficient demographic population statistics also help to scatter goods where it is need in nearby retailers. It solves risk of product unavailable and prevent shifting cost to competitors.

From mentioned efficiencies and performances manufacturer and retailer can derive information into portfolio that can be made for financial loans and secure ownership of state enterprises when there is need for maximize market competition. This is important to business functioning when at time of resilienceness needs financial loans is mostly when higher demands signal more production, this prevents product unavailability on shelf from and prevent brand disappearance from market from inability to acquire raw materials for successful production. Thus, optimizing supply chain through the use of web-base also help to recognize where and when market booming will happen, this would signal earlier to retailer and manufacturer for stocking of raw materials. Such event might happen soon, from the fact that COVID now has emerge new evidence that can cause memory problems and the use of bacopa extract may be supplement for memory deficits, next to andrographolide extracts for antiviral properties and centella asiatica extract for inflammations.

With the retail sector, the management seems to be better with synchronization as it provides more insights into some information that is need for the customer care. With the information visible, communications with manufacturers were clearer in getting right amount of order items for re-stocking. This had made forecast easier and efficient in re-stocking that shows performance in logistics of manufacturer.

With customer or web tracking user, it can be concluded that the web system makes their lifestyle more convenient in using technology to control their administration of supplements. Also, it acts as a good remind to take pills during the day. This give good results with findings that more user was adhere to IT usage and prompts for future changes in IT that has more functions in social media like that user

can interact more with retailers. In the future, the application of digital patronage in IT can be made after the change into social media like platform.

### **Future Studies**

With much referenced work, citation of current research within the time frame of 10 years, it can be summarized that synchronization had evolve through time into a practice that needs digital technology and computer information technology, thus can be said that future of synchronization needs to be evolve with digital innovation. From this several future studies can be made through 1 – 10 that can be made with green technology in mind, digital patronage, and AI system that can process synchronization in software platform or hardware AI chip.

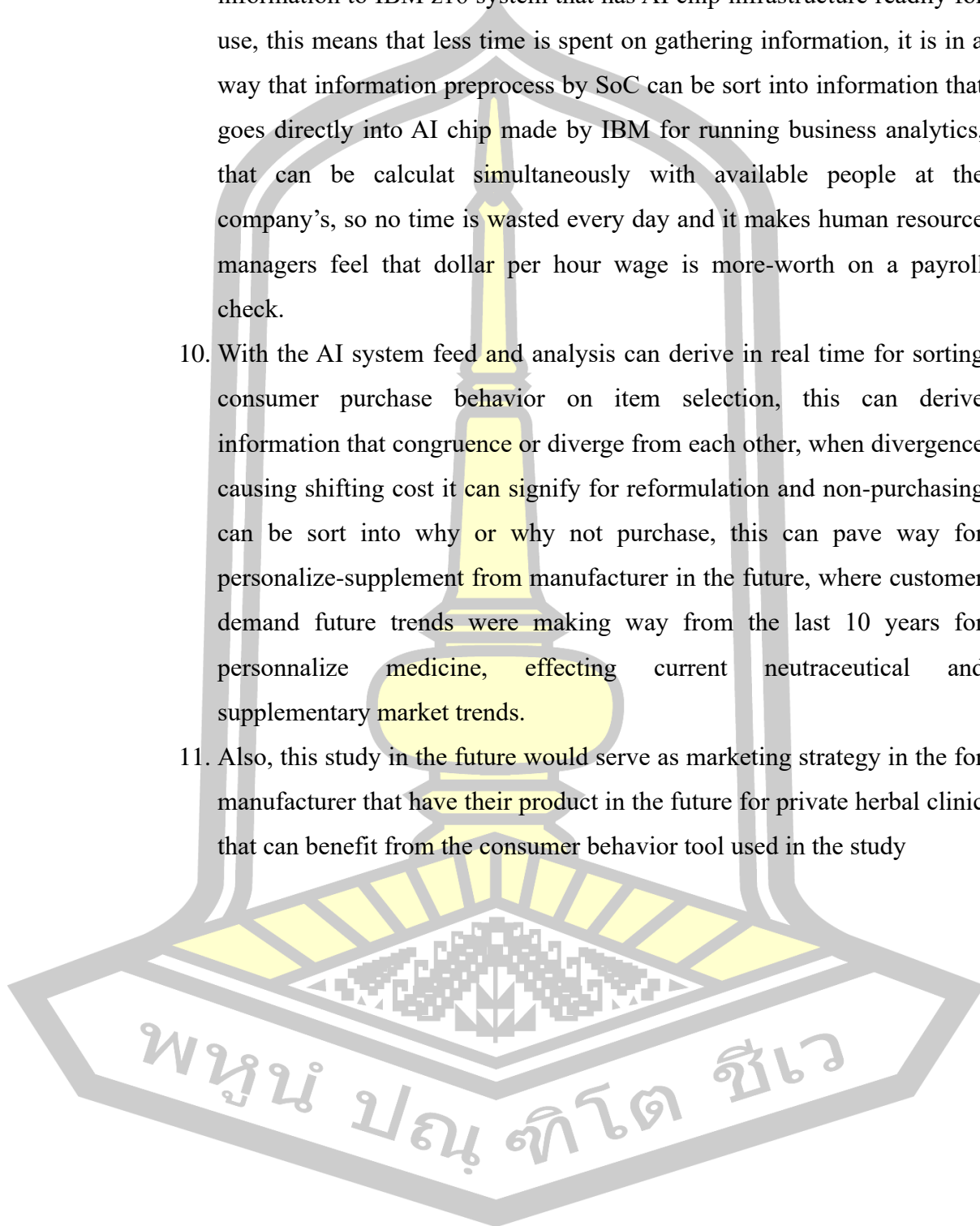
1. Instead of using traditional web-hosting with SQL database for storage and retrieval of data. WordPress web-hosting may be use. It can make more data visible when customers can send comments and certain needs can be address to retailers or manufacturers.
2. The research was done primarily using fixed dosage supplement. In the future, if done to new supplement items that enable dosage titration, similar to some of drugs in modern medicine. When certain supplements can be titrated to higher amount, it may be added to existing synchronization system to determine raw material needs which can maximize resilience studies in manufacturing.
3. When consumption is high and machines weren't enough from in-house production, a knowledge-base from synchronization may be lend to private manufacturer such as OEM manufacturer of supplement goods, this may help alleviate the production during hit-and-nitch while maintaining marketability and brand & merchandise survivability in competitive markets.
4. For stores that hadn't been reseller of bacopa products, more studies could be done to retrieve information and further maximize the synchronization to reach larger number of users that may be use to adjust manufacturing capacity, efficiency, and performance to meet future market needs. This

would commence more larger trials of study to complete challenges that would have made changes in the manufacturing practices and larger market share acquisition that bring challenges to supply chain management.

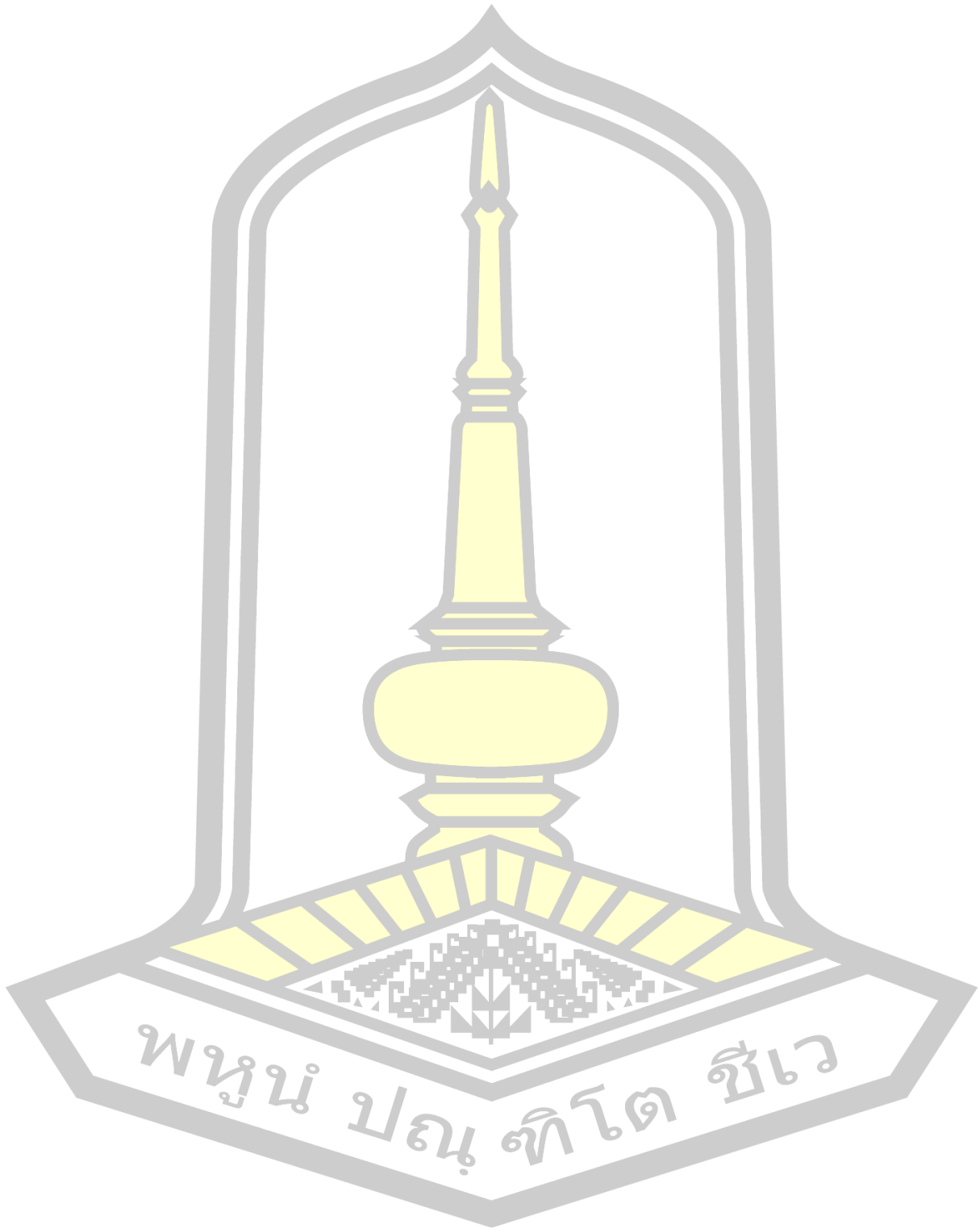
5. Application of android and iPhone can be used for making better adherence to phone use that can make way for digital patronage to happen. Use of new technologies like WordPress can be used to create digital patronage and a lot of interactions and productivity can be achieved through consumer care and marketing plans for customer.
6. Further information from this study can be used to study in finance area that one may be interested in Retail Profit Performance, Shareholder ROI, and Dividends Satisfaction that seeks to evaluate Retailer Financial Performance that can be used for financing.
7. Banker's Decision and actions can be used for future studies in synchronization of organization that is currently in competition between each other. Profit dividends between organizations can show future trends. Market shares and market trends can be seen from this future studies may be needed to evaluate future market trends and supply chain needed for the growing supplements and nutraceuticals.
8. Small size web system can be further developed into low power SoC servers that can be suitable for start ups, small business, entrepreneurs, and large enterprise that needs to invest for IT cost saving infrastructure, which seems to be social responsibility for Thai citizens when it comes to utilizing Electrical power that enable saving for new generations of people, more people can use electricity for something else, which can result in large scale electrical power utilization efficiently. Million people in the future can benefit from same sustainable MW usage of current time.
9. From the SoC base system of small size web can gather data that can form information readily for A.I. system that is readily for processing today, systems that runs AI software thoroughly for predictions and business analytics can benefit from this small size system SoC. Also, if it

were to be hardware-to-hardware link this SoC system can be use to link information to IBM z16 system that has AI chip infrastructure readily for use, this means that less time is spent on gathering information, it is in a way that information preprocess by SoC can be sort into information that goes directly into AI chip made by IBM for running business analytics, that can be calculat simultaneously with available people at the company's, so no time is wasted every day and it makes human resource managers feel that dollar per hour wage is more-worth on a payroll check.

10. With the AI system feed and analysis can derive in real time for sorting consumer purchase behavior on item selection, this can derive information that congruence or diverge from each other, when divergence causing shifting cost it can signify for reformulation and non-purchasing can be sort into why or why not purchase, this can pave way for personalize-supplement from manufacturer in the future, where customer demand future trends were making way from the last 10 years for personnalize medicine, effecting current neutraceutical and supplementary market trends.
11. Also, this study in the future would serve as marketing strategy in the for manufacturer that have their product in the future for private herbal clinic that can benefit from the consumer behavior tool used in the study



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## APPENDIX A

### MULTIPLE REGRESSION CONSUMER ADHERENCE

#### Cost Adherence

##### Descriptive Statistics

	Mean	Std. Deviation	N
BottlePrice	1.6528	.47225	1268
BottlePriceAndContinuity	4.6577	.47962	1268
PricePerPillEconomical	4.6159	.54182	1268
CostEffectivePill	4.6459	.49465	1268
SupplementAloneCostEffective	4.6427	.50347	1268
BottlePriceFitLifestyle	4.6498	.48214	1268
TravelCostAffectPromotionBuy	4.6404	.51036	1268
EconomicalWhenEffectiveInCombination	4.6396	.50903	1268
TravelExpenseAffectBasePurchase	4.6388	.51233	1268

##### Correlations

	BottlePrice	BottlePriceAndContinuity	PricePerPillEconomical	CostEffectivePill	SupplementAloneCostEffective	BottlePriceFitLifestyle	TravelCostAffectPromotionBuy	EconomicalWhenEffectiveInCombination	TravelExpenseAffectBasePurchase
Pe ar so n C orr el	BottlePrice	.712	.656	.706	.660	.723	.724	.721	.717
	BottlePriceAndContinuity	1.000	.772	.889	.758	.874	.864	.914	.855
	PricePerPillEconomical	.772	1.000	.717	.758	.772	.824	.814	.799





N	BottlePrice	1268	1268	1268	1268	1268	1268	1268	1268
	BottlePriceAndContinuity	1268	1268	1268	1268	1268	1268	1268	1268
	PricePerPillEconomical	1268	1268	1268	1268	1268	1268	1268	1268
	CostEffectivePill	1268	1268	1268	1268	1268	1268	1268	1268
	SupplementAloneCostEffective	1268	1268	1268	1268	1268	1268	1268	1268
	BottlePriceFitLifestyle	1268	1268	1268	1268	1268	1268	1268	1268
	TravelCostAffectPromotionBuy	1268	1268	1268	1268	1268	1268	1268	1268
	EconomicalWhenEffectiveInCombination	1268	1268	1268	1268	1268	1268	1268	1268
	TravelExpenseAffectBasePurchase	1268	1268	1268	1268	1268	1268	1268	1268

**Model Summary**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.761 <sup>a</sup>	.579	.576	.30734

a. Predictors: (Constant), TravelExpenseAffectBasePurchase, PricePerPillEconomical, SupplementAloneCostEffective, CostEffectivePill, BottlePriceAndContinuity, BottlePriceFitLifestyle, TravelCostAffectPromotionBuy, EconomicalWhenEffectiveInCombination

**ANOVA<sup>a</sup>**

Model	Sum of Squares	df	Mean Square	F	Sig.
1 Regression	163.644	8	20.455	216.558	.000 <sup>b</sup>

Residual	118.922	1259	.094		
Total	282.565	1267			

a. Dependent Variable: BottlePrice

b. Predictors: (Constant), TravelExpenseAffectBasePurchase, PricePerPillEconomical, SupplementAloneCostEffective, CostEffectivePill, BottlePriceAndContinuity, BottlePriceFitLifestyle, TravelCostAffectPromotionBuy, EconomicalWhenEffectiveInCombination

### Coefficients<sup>a</sup>

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	99.0% Confidence Interval for B	
	B	Std. Error	Beta			Lower Bound	Upper Bound
1 (Constant)	-2.001	.091		-21.951	.000	-2.236	-1.766
BottlePriceAndContinuity	.180	.049	.183	3.678	.000	.054	.307
PricePerPillEconomical	.102	.030	.117	3.435	.001	.025	.179
CostEffectivePill	.198	.045	.207	4.354	.000	.080	.315
SupplementAloneCostEffective	.094	.034	.101	2.791	.005	.007	.181
BottlePriceFitLifestyle	.162	.050	.166	3.244	.001	.033	.292
TravelCostAffectPromotionBuy	.157	.059	.170	2.649	.008	.004	.310
EconomicalWhenEffectiveInCombination	-.251	.075	-.270	-3.329	.001	-.445	-.056
TravelExpenseAffectBasePurchase	.144	.053	.156	2.712	.007	.007	.281

a. Dependent Variable: BottlePrice

With  $R^2$ , all of predictors can account for 57.9% of all variables in multiple regression involved.

### Satisfaction-Adherence

#### Descriptive Statistics

	Mean	Std. Deviation	N
SatisfactoryPriceEffectiveness	1.6514	.47247	1268
ContinuousSatisfactoryPricing	4.6427	.49557	1268
BottlePriceEconomicalYearRound	4.6569	.47988	1268
PriceShiftStillEconomical	4.6514	.48165	1268
PricePerPillEconomical	4.6506	.50587	1268
MultipleBottlePricePurchasedEconomical	4.6199	.54097	1268
QualityWorthPurchasePrice	4.6388	.51079	1268

#### Correlations

	SatisfactoryPriceEffectiveness	ContinuousSatisfactoryPricing	BottlePriceEconomicalYearRound	PriceShiftStillEconomical	PricePerPillEconomical	MultipleBottlePricePurchasedEconomical	QualityWorthPurchasePrice
Pe ars on ss	1.000	.706	.720	.722	.703	.647	.725
Co rre lati on	.706	1.000	.885	.863	.884	.703	.846
	.720	.885	1.000	.862	.884	.756	.859
	.722	.863	.862	1.000	.883	.751	.890



PriceShiftStill Economical	1268	1268	1268	1268	1268	1268	1268
PricePerPillE conomical	1268	1268	1268	1268	1268	1268	1268
MultipleBottle PricePurchas edEconomica l	1268	1268	1268	1268	1268	1268	1268
QualityWorth PurchasePric e	1268	1268	1268	1268	1268	1268	1268

**Model Summary**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.762 <sup>a</sup>	.581	.579	.30642

a. Predictors: (Constant), QualityWorthPurchasePrice, MultipleBottlePricePurchasedEconomical, ContinuousSatisfactoryPricing, BottlePriceEconomicalYearRound, PriceShiftStillEconomical, PricePerPillEconomical

**ANOVA<sup>a</sup>**

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	164.425	6	27.404	291.856	.000 <sup>b</sup>
	Residual	118.403	1261	.094		
	Total	282.827	1267			

a. Dependent Variable: SatisfactoryPriceEffectiveness

b. Predictors: (Constant), QualityWorthPurchasePrice, MultipleBottlePricePurchasedEconomical, ContinuousSatisfactoryPricing, BottlePriceEconomicalYearRound, PriceShiftStillEconomical, PricePerPillEconomical

**Coefficients<sup>a</sup>**

Model	Unstandardized Coefficients	Standardized Coefficients	t	Sig.	99.0% Confidence Interval for B



	B	Std. Error	Beta			Lower Bound	Upper Bound
1 (Constant)	1.960	.088		22.318	.000	-2.186	-1.733
ContinuousSatisfactoryPricing	.173	.044	.181	3.924	.000	.059	.286
BottlePriceEconomicalYearRound	.212	.046	.215	4.645	.000	.094	.329
PriceShiftStillEconomical	.203	.045	.207	4.488	.000	.086	.320
PricePerPillEconomical	-.159	.055	-.170	-2.903	.004	-.300	-.018
MultipleBottlePricePurchasedEconomical	.118	.029	.135	4.143	.000	.045	.192
QualityWorthPurchasePrice	.231	.051	.250	4.551	.000	.100	.363

a. Dependent Variable: SatisfactoryPriceEffectiveness

With  $R^2$ , all of predictors can account for 58.1% of all variables in multiple regression involved.

### Adherence Knowledge

#### Descriptive Statistics

	Mean	Std. Deviation	N
HealthCareProvideEnoughKnowledge	1.6185	.47991	1268
IncreaseSeverityIncreaseAdherence	4.6412	.50392	1268
HealthCareProvideEnoughIndicationUse	4.6412	.49602	1268
HealthCareProvideUsageKnowledge	4.6388	.51079	1268

LongTermKnowledgeProvided	4.6293	.50708	1268
MoreAdherenceAfterLongTermClarified	4.6443	.49511	1268
ImprovementHelpsMoreAdherence	4.6530	.47951	1268
HealthConditionRemindPurchase	4.6396	.51212	1268
ProductLabelProvideSameAdvice	4.6215	.54061	1268

**Correlations**

	HealthCareProvidersEnoughKnowledge	IncreaseSeverityIncreaseAdherence	HealthCareProvidersEnoughIndicationUse	HealthCareProvidersUsageKnowledge	LongTermKnowledgeProvided	MoreAdherenceAfterLongTermClarified	ImprovementHelpsMoreAdherence	HealthConditionRemindPurchase	ProductLabelProvideSameAdvice
HealthCareProvidersEnoughKnowledge	1.000	.609	.662	.665	.628	.656	.675	.642	.615
IncreaseSeverityIncreaseAdherence	.609	1.000	.751	.839	.977	.757	.745	.820	.755
HealthCareProvidersEnoughIndicationUse	.662	.751	1.000	.846	.739	.994	.880	.879	.694
HealthCareProvidersUsageKnowledge	.665	.839	.846	1.000	.823	.852	.867	.923	.814





HealthCareProvideEnoughIndicationUse	1268	1268	1268	1268	1268	1268	1268	1268	1268
HealthCareProvideUsageKnowledge	1268	1268	1268	1268	1268	1268	1268	1268	1268
LongTermKnowledgeProvided	1268	1268	1268	1268	1268	1268	1268	1268	1268
MoreAdherenceAfterLongTermClarified	1268	1268	1268	1268	1268	1268	1268	1268	1268
ImprovementHelpsMoreAdherence	1268	1268	1268	1268	1268	1268	1268	1268	1268
HealthConditionRemindPurchase	1268	1268	1268	1268	1268	1268	1268	1268	1268
ProductLabelProvideSameAdvice	1268	1268	1268	1268	1268	1268	1268	1268	1268

ANOVA<sup>a</sup>

Model	Sum of Squares	df	Mean Square	F	Sig.
1 Regression	155.479	8	19.435	179.485	.000 <sup>b</sup>

Residual	136.326	1259	.108		
Total	291.804	1267			

a. Dependent Variable: HealthCareProvideEnoughKnowledge

b. Predictors: (Constant), ProductLabelProvideSameAdvice, HealthCareProvideEnoughIndicationUse, LongTermKnowledgeProvided, ImprovementHelpsMoreAdherence, HealthCareProvideUsageKnowledge, HealthConditionRemindPurchase, IncreaseSeverityIncreaseAdherence, MoreAdherenceAfterLongTermClarified

### Coefficients<sup>a</sup>

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-1.880	.096		-19.638	.000
	IncreaseSeverityIncreaseAdherence	-.500	.091	-.525	-5.527	.000
	HealthCareProvideEnoughIndicationUse	.786	.165	.812	4.765	.000
	HealthCareProvideUsageKnowledge	.165	.054	.176	3.037	.002
	LongTermKnowledgeProvided	.627	.086	.662	7.301	.000
	MoreAdherenceAfterLongTermClarified	-.574	.171	-.592	-3.356	.001
	ImprovementHelpsMoreAdherence	.300	.049	.300	6.165	.000
	HealthConditionRemindPurchase	-.206	.057	-.219	-3.615	.000
	ProductLabelProvideSameAdvice	.158	.031	.178	5.084	.000

a. Dependent Variable: HealthCareProvideEnoughKnowledge

### Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.730 <sup>a</sup>	.533	.530	.32906









RepurchaseFrequentlyBeforePromotionEnds	1268	1268	1268	1268	1268	1268	1268	1268
FrequentPromotionFrequentPurchases	1268	1268	1268	1268	1268	1268	1268	1268
PromotionAffectContinuePurchaseForLongTerm	1268	1268	1268	1268	1268	1268	1268	1268

**ANOVA<sup>a</sup>**

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	152.631	7	21.804	197.259	.000 <sup>b</sup>
	Residual	139.277	1260	.111		
	Total	291.908	1267			

a. Dependent Variable: PromotePriceAdhereLongTerm

b. Predictors: (Constant), PromotionAffectContinuePurchaseForLongTerm, FeelingsReachMadePurchased, RepurchaseFrequentlyBeforePromotionEnds, PriceAdhereLongTerm, PromotionMakesFrequentVisitAtRetail, QualityPriceAdhereLongTerm, FrequentPromotionFrequentPurchases

**Coefficients<sup>a</sup>**

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-1.902	.097		-19.681	.000
	PriceAdhereLongTerm	.142	.044	.154	3.232	.001
	QualityPriceAdhereLongTerm	-.220	.054	-.234	-4.089	.000
	FeelingsReachMadePurchase	.782	.167	.808	4.691	.000

PromotionMakesFrequentVisit AtRetail	.276	.049	.275	5.648	.000
RepurchaseFrequentlyBeforeP romotionEnds	.172	.034	.182	5.045	.000
FrequentPromotionFrequentPu rchases	-.533	.173	-.550	-3.080	.002
PromotionAffectContinuePurch aseForLongTerm	.140	.031	.158	4.462	.000

a. Dependent Variable: PromotePriceAdhereLongTerm

**Model Summary**

Model	R	R Square	Adjusted Square	R	Std. Error of the Estimate
1	.723 <sup>a</sup>	.523	.520		.33247

a. Predictors: (Constant), PromotionAffectContinuePurchaseForLongTerm, FeelingsReachMadePurchased, RepurchaseFrequentlyBeforePromotionEnds, PromotePriceAdhereLongTerm, PromotionMakesFrequentVisitAtRetail, QualityPriceAdhereLongTerm, FrequentPromotionFrequentPurchases

With R<sup>2</sup>, all of predictors can account for 52.3% of all variables in multiple regression involved.

**Education Adherence**

**Descriptive Statistics**

	Mean	Std. Deviation	N
ProductEducationMeetExpe ctation	1.6028	.48231	1268
HealthcareProvideAnswerFo rAdherence	4.6246	.53989	1268
ItemizedDiscussionImprove Adherence	4.6262	.52319	1268

FurtherSelfEducatedImprov eAdherence	4.6396	.50122	1268
EducationLanguageWereNo Barrier	4.6530	.47951	1268
ReCounselingIsNotNeedFor Use	4.6475	.49418	1268
FeltMorePositiveForUseAfte rEducated	4.6467	.48474	1268
InformationEasilyUnderstood	4.6538	.48254	1268

**Correlations**

	Product Education MeetExpectation	Healthcare ProvideAnswerFor Adherence	Itemized DiscussionImprove Adherence	FurtherSelf EducationImprove Adherence	Education LanguageWere NoBarrier	ReCounseling IsNotNeededFor Use	FeltMore PositiveForUse AfterEducated	Information EasilyUnderstood
ProductEducation MeetExpectation	1.000	.602	.640	.642	.651	.632	.679	.664
Healthcare ProvideAnswerFor Adherence	.602	1.000	.802	.687	.753	.708	.702	.707
Itemized DiscussionImprove Adherence	.640	.802	1.000	.804	.835	.815	.789	.791
FurtherSelf EducationImprove Adherence	.642	.687	.804	1.000	.868	.981	.915	.910



Education Language WereNoB arrier	.651	.753	.835	.868	1.000	.879	.868	.876
ReCouns elingsIsNot NeedForU se	.632	.708	.815	.981	.879	1.000	.916	.911
FeltMoreP ositiveFor UseAfterE ducated	.679	.702	.789	.915	.868	.916	1.000	.982
Informatio nEasilyUn derstood	.664	.707	.791	.910	.876	.911	.982	1.000
Si ProductE g. ducationM (1- eetExpect ta ation		.000	.000	.000	.000	.000	.000	.000
il Healthcar e ProvideA d) nswerFor Adherenc e	.000		.000	.000	.000	.000	.000	.000
ItemizedD iscussionI mproveAd herence	.000	.000		.000	.000	.000	.000	.000
FurtherSe lfEducate dImprove Adherenc e	.000	.000	.000		.000	.000	.000	.000
Education Language WereNoB arrier	.000	.000	.000	.000		.000	.000	.000



FeltMorePositiveForUseAfterEducated	1268	1268	1268	1268	1268	1268	1268	1268
InformationEasilyUnderstood	1268	1268	1268	1268	1268	1268	1268	1268

**ANOVA<sup>a</sup>**

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	150.531	7	21.504	187.903	.000 <sup>b</sup>
	Residual	144.200	1260	.114		
	Total	294.730	1267			

a. Dependent Variable: ProductEducationMeetExpectation

b. Predictors: (Constant), InformationEasilyUnderstood, HealthcareProvideAnswerForAdherence, ItemizedDiscussionImproveAdherence, EducationLanguageWereNoBarrier, FurtherSelfEducatedImproveAdherence, FeltMorePositiveForUseAfterEducated, ReCounselingIsNotNeedForUse

**Coefficients<sup>a</sup>**

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-1.786	.097		-18.464	.000
	HealthcareProvideAnswerForAdherence	.153	.031	.171	4.965	.000
	ItemizedDiscussionImproveAdherence	.143	.039	.155	3.653	.000
	FurtherSelfEducatedImproveAdherence	.378	.101	.393	3.745	.000
	EducationLanguageWereNoBarrier	.134	.050	.134	2.713	.007
	ReCounselingIsNotNeedForUse	-.480	.106	-.492	-4.541	.000

FeltMorePositiveForUseAfterE ducated	.688	.107	.691	6.425	.000
InformationEasilyUnderstood	-.284	.107	-.284	-2.661	.008

a. Dependent Variable: ProductEducationMeetExpectation

**Model Summary**

Model	R	R Square	Adjusted Square	R	Std. Error of the Estimate
1	.715 <sup>a</sup>	.511	.508		.33830

a. Predictors: (Constant), InformationEasilyUnderstood, HealthcareProvideAnswerForAdherence, ItemizedDiscussionImproveAdherence, EducationLanguageWereNoBarrier, FurtherSelfEducatedImproveAdherence, FeltMorePositiveForUseAfterEducated, ReCounselingIsNotNeedForUse

With R<sup>2</sup>, all of predictors can account for 51.1% of all variables in multiple regression involved.

**Adherence Benefits**

**Descriptive Statistics**

	Mean	Std. Deviation	N
FeelSafeLongTermFromStandardization	1.6406	.47770	1268
MoreAdhereFromBenefitEducation	4.6625	.50219	1268
LongTermAdherenceFromEducationBenefits	4.6743	.46882	1268
EverydayUseMakesAdhereLongTerm	4.6625	.47472	1268
EverdayEfficacyImproveAdherence	4.6380	.51409	1268
PerceiveBenefitEncourageLongTermUse	4.6514	.51491	1268

LongTermSafetyCombinationWithDrugs	4.6388	.50924	1268
MoreAdhereWhenUnderstoodManufactureBenefit	4.6932	.46644	1268



**Correlations**

	FeelSafeLongTermFromStandardization	MoreAdhereFromBenefitEducation	LongTermAdherenceFromEducationBenefits	EverydayUseMakesAdhereLongTerm	EverdayEfficyImproveAdherence	PerceiveBenefitEncourageLongTermUse	LongTermSafetyCombinationWithDrugs	MoreAdhereWhenUnderstoodManufactureBenefit
FeelSafeLongTermFromStandardization	1.000	.760	.810	.799	.796	.766	.805	.784
MoreAdhereFromBenefitEducation	.760	1.000	.880	.846	.868	.814	.955	.835
LongTermAdherenceFromEducationBenefits	.810	.880	1.000	.896	.853	.817	.875	.889
EverydayUseMakesAdhereLongTerm	.799	.846	.896	1.000	.860	.813	.886	.837
EverdayEfficyImproveAdherence	.796	.868	.853	.860	1.000	.892	.911	.820
PerceiveBenefitEncourageLongTermUse	.766	.814	.817	.813	.892	1.000	.859	.783

LongTerm SafetyCom binationWit hDrugs	.805	.955	.875	.886	.911	.859	1.000	.836
MoreAdher eWhenUnd erstoodMa nufactureB enefit	.784	.835	.889	.837	.820	.783	.836	1.000
S FeelSafeL ig ongTermFr omStandar (1 dization - MoreAdher t eFromBen ai efitEducati le on d) LongTerm Adherence FromEduc ationBenefi ts EverydayU seMakesA dhereLong Term EverdayEff icacyImpro veAdheren ce PerceiveB enefitEnco urageLong TermUse LongTerm SafetyCom binationWit hDrugs		.000	.000	.000	.000	.000	.000	.000
	.000		.000	.000	.000	.000	.000	.000
	.000	.000	.000		.000	.000	.000	.000
	.000	.000	.000	.000		.000	.000	.000
	.000	.000	.000	.000	.000		.000	.000
	.000	.000	.000	.000	.000		.000	.000
	.000	.000	.000	.000	.000		.000	.000
	.000	.000	.000	.000	.000		.000	.000





**Model Summary**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.851 <sup>a</sup>	.724	.722	.25175

a. Predictors: (Constant), MoreAdhereWhenUnderstoodManufactureBenefit, PerceiveBenefitEncourageLongTermUse, MoreAdhereFromBenefitEducation, EverydayUseMakesAdhereLongTerm, EverdayEfficacyImproveAdherence, LongTermAdherenceFromEducationBenefits, LongTermSafetyCombinationWithDrugs

**ANOVA<sup>a</sup>**

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	209.265	7	29.895	471.684	.000 <sup>b</sup>
	Residual	79.858	1260	.063		
	Total	289.123	1267			

a. Dependent Variable: FeelSafeLongTermFromStandardization

b. Predictors: (Constant), MoreAdhereWhenUnderstoodManufactureBenefit, PerceiveBenefitEncourageLongTermUse, MoreAdhereFromBenefitEducation, EverydayUseMakesAdhereLongTerm, EverdayEfficacyImproveAdherence, LongTermAdherenceFromEducationBenefits, LongTermSafetyCombinationWithDrugs

**Coefficients<sup>a</sup>**

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-2.439	.075		-32.565	.000
	MoreAdhereFromBenefitEducation	-.292	.052	-.307	-5.675	.000
	LongTermAdherenceFromEducationBenefits	.275	.045	.270	6.096	.000
	EverydayUseMakesAdhereLongTerm	.111	.039	.111	2.821	.005

EverdayEfficacyImproveAdherence	.112	.040	.121	2.798	.005
PerceiveBenefitEncourageLongTermUse	.084	.032	.091	2.642	.008
LongTermSafetyCombinationWithDrugs	.394	.061	.420	6.503	.000
MoreAdhereWhenUnderstoodManufactureBenefit	.191	.035	.187	5.499	.000

a. Dependent Variable: FeelSafeLongTermFromStandardization

With  $R^2$ , all of predictors can account for 72.4% of all variables in multiple regression involved.

## Web Tracking Adherence

### Descriptive Statistics

	Mean	Std. Deviation	N
HaveProblemWithAdherenceRegularly	1.6519	.47199	1268
MoreEnergeticWhenUseTechnologyDevice	4.6451	.49488	1268
SystemsIsMoreConvenient	4.6467	.49442	1268
TechnologyAccessibleHelpfulness	4.6451	.50748	1268
WebsystemHelpAdherenceRegularly	4.6530	.48605	1268
FeelMoreConfidentInSupplementUse	4.6625	.47804	1268

MoreRobustInTrackEfficiency	4.6388	.51079	1268
WebTrackingSolveAdherence	4.6420	.50369	1268



**Correlations**

	HaveProblemWithAdherenceRegularly	MoreEnergyWhenUseTechnologyDevice	SystemsMoreConvenient	TechnologyAccessibleHelpfulness	WebsystemHelpAdherenceRegularly	FeelMoreConfidentInSupplementUse	MoreRobustInTrackEfficiency	WebTrackingSolveAdherence
HaveProblemWithAdherenceRegularly	1.000	.699	.702	.714	.712	.718	.725	.660
MoreEnergyWhenUseTechnologyDevice	.699	1.000	.994	.897	.869	.881	.854	.760
SystemsMoreConvenient	.702	.994	1.000	.890	.862	.874	.848	.753
TechnologyAccessibleHelpfulness	.714	.897	.890	1.000	.905	.921	.939	.830
WebsystemHelpAdherenceRegularly	.712	.869	.862	.905	1.000	.943	.849	.740
FeelMoreConfidentInSupplementUse	.718	.881	.874	.921	.943	1.000	.864	.756
MoreRobustInTrackEfficiency	.725	.854	.848	.939	.849	.864	1.000	.844



SystemIsMoreConvenient	1268	1268	1268	1268	1268	1268	1268	1268
TechnologyAccessibleHelpForgetfulness	1268	1268	1268	1268	1268	1268	1268	1268
WebSystemHelpAdherenceRegularly	1268	1268	1268	1268	1268	1268	1268	1268
FeelMoreConfidentInSupplementUse	1268	1268	1268	1268	1268	1268	1268	1268
MoreRobustInTrackEfficiency	1268	1268	1268	1268	1268	1268	1268	1268
WebTrackingSolveAdherence	1268	1268	1268	1268	1268	1268	1268	1268

**Model Summary**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.761 <sup>a</sup>	.580	.577	.30684

a. Predictors: (Constant), WebTrackingSolveAdherence, WebSystemHelpAdherenceRegularly, SystemIsMoreConvenient, MoreRobustInTrackEfficiency, FeelMoreConfidentInSupplementUse, TechnologyAccessibleHelpForgetfulness, MoreEnergeticWhenUseTechnologyDevice

**ANOVA<sup>a</sup>**

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	163.621	7	23.374	248.262	.000 <sup>b</sup>
	Residual	118.632	1260	.094		
	Total	282.253	1267			



- a. Dependent Variable: HaveProblemWithAdherenceRegularly
- b. Predictors: (Constant), WebTrackingSolveAdherence, WebsystemHelpAdherenceRegularly, SystemIsMoreConvenient, MoreRobustInTrackEfficiency, FeelMoreConfidentInSupplementUse, TechnologyAccessibleHelpForgetfulness, MoreEnergeticWhenUseTechnologyDevice



**Coefficients<sup>a</sup>**

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	99.0% Confidence Interval for B	
	B	Std. Error	Beta			Lower Bound	Upper Bound
1 (Constant)	1.991	.090		22.095	.000	-2.223	-1.758
MoreEnergeticWhenUseTechnologyDevice	-.485	.159	-.509	-3.048	.002	-.896	-.075
SystemIsMoreConvenient	.624	.154	.654	4.058	.000	.227	1.021
TechnologyAccessibleHelpForgetfulness	-.244	.068	-.263	-3.572	.000	-.421	-.068
WebsystemHelpAdherenceRegularly	.194	.056	.199	3.460	.001	.049	.338
FeelMoreConfidentInSupplementUse	.215	.062	.217	3.441	.001	.054	.376
MoreRobustInTrackEfficiency	.342	.052	.371	6.554	.000	.208	.477
WebTrackingSolveAdherence	.138	.033	.147	4.227	.000	.054	.222

a. Dependent Variable: HaveProblemWithAdherenceRegularly

With R<sup>2</sup>, all of predictors can account for 58.0% of all variables in multiple regression involved.

## HYPOTHESIS GROUP 1

### Pricing Performance affects Consumer Adherence

#### Descriptive Statistics

	Mean	Std. Deviation	N
ContinuablePrice	1.6567	.47286	1180
BottlePrice	4.6492	.50338	1180
EconomicPrice	4.6517	.47664	1180
PillCostEffective	4.6364	.51197	1180
SupplementEffective	4.6407	.49394	1180
PriceFitsLifeStyle	4.6593	.47592	1180

**Correlations**

		Continuable Price	Bottle Price	Economic Price	PillCost Eff
Pearson Correlation	ContinuablePrice	1.000	.723	.802	.796
	BottlePrice	.723	1.000	.819	.867
	EconomicPrice	.802	.819	1.000	.927
	PillCostEffective	.796	.867	.927	1.000
	SupplementEffective	.787	.792	.916	.888
	PriceFitsLifeStyle	.784	.779	.897	.887
Sig. (1-tailed)	ContinuablePrice		.000	.000	.000
	BottlePrice	.000		.000	.000
	EconomicPrice	.000	.000		.000
	PillCostEffective	.000	.000	.000	
	SupplementEffective	.000	.000	.000	.000
	PriceFitsLifeStyle	.000	.000	.000	.000
N	ContinuablePrice	1180	1180	1180	1180
	BottlePrice	1180	1180	1180	1180
	EconomicPrice	1180	1180	1180	1180
	PillCostEffective	1180	1180	1180	1180
	SupplementEffective	1180	1180	1180	1180
	PriceFitsLifeStyle	1180	1180	1180	1180

**ANOVA<sup>a</sup>**

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	178.893	5	35.779	495.756	.000 <sup>b</sup>
	Residual	84.727	1174	.072		
	Total	263.620	1179			

a. Dependent Variable: ContinuablePrice

b. Predictors: (Constant), PriceFitsLifeStyle, BottlePrice, EconomicPrice, SupplementEffective, PillCostEffective

**Coefficients<sup>a</sup>**

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Lower Bound	Upper Bound
		B	Std. Error	Beta				
1	(Constant)	-2.220	.082		-27.224	.000	-2.382	-2.058
	BottlePrice	.090	.031	.095	2.857	.004	.028	.152
	EconomicPrice	.251	.052	.253	4.797	.000	.147	.355
	PillCostEffective	.180	.049	.195	3.670	.000	.082	.278
	SupplementEffective	.129	.049	.135	2.636	.008	.031	.227
	PriceFitsLifeStyle	.184	.047	.185	3.886	.000	.090	.278

a. Dependent Variable: ContinuablePrice

**Model Summary**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.824 <sup>a</sup>	.679	.677	.26864

a. Predictors: (Constant), PriceFitsLifeStyle, BottlePrice, EconomicPrice, SupplementEffective, PillCostEffective

With R<sup>2</sup>, all of predictors can account for 67.9% of all variables in multiple regression involved.

**Sale Efficiency affect Consumer Adherence**

**Descriptive Statistics**

	Mean	Std. Deviation	N
SaleEfficiency	1.6424	.47591	1180
PriceFeelingReach	4.6415	.50558	1180
ContinualUseDecision	4.6466	.48352	1180
RepurchaseRegardlessPrice	4.5644	.56179	1180

**Correlations**

		SaleEfficiency	PriceFeelingReach	ContinualUseDecision	RepurchaseRegardlessPrice
Pearson Correlation	SaleEfficiency	1.000	.653	.723	.592
	PriceFeelingReach	.653	1.000	.793	.629
	ContinualUseDecision	.723	.793	1.000	.757
	RepurchaseRegardlessPrice	.592	.629	.757	1.000
Sig. (1-tailed)	SaleEfficiency	.000	.000	.000	.000
	PriceFeelingReach	.000	.000	.000	.000
	ContinualUseDecision	.000	.000	.000	.000
	RepurchaseRegardlessPrice	.000	.000	.000	.000
N	SaleEfficiency	1180	1180	1180	1180
	PriceFeelingReach	1180	1180	1180	1180
	ContinualUseDecision	1180	1180	1180	1180
	RepurchaseRegardlessPrice	1180	1180	1180	1180

**ANOVA<sup>a</sup>**

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	145.102	3	48.367	466.502	.000 <sup>b</sup>
	Residual	121.929	1176	.104		
	Total	267.031	1179			

a. Dependent Variable: SaleEfficiency

b. Predictors: (Constant), RepurchaseRegardlessPrice, PriceFeelingReach, ContinualUseDecision

**Coefficients<sup>a</sup>**

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	99.0% Confidence Interval for B		
	B	Std. Error	Beta			Lower Bound	Upper Bound	
1 (Constant)	-1.855	.094		19.666	.000	-2.098	-1.612	
	PriceFeelingReach	.194	.031	.206	6.354	.000	.115	.273
	ContinualUseDecision	.484	.038	.492	12.763	.000	.386	.582
	RepurchaseRegardlessPrice	.076	.026	.090	2.971	.003	.010	.142

a. Dependent Variable: SaleEfficiency

**Model Summary**

Model	R	R Square	Adjusted Square	R	Std. Error of the Estimate
1	.818 <sup>a</sup>	.670	.669		.27210

a. Predictors: (Constant), MultiplePurchase, AtVisitRepurchase, ContinuePurchase

With  $R^2$ , all of predictors can account for 67% of all variables in multiple regression involved.

**Retail Stocking Efficiency affects Consumer Adherence****Descriptive Statistics**

	Mean	Std. Deviation	N
AdhereLongTerm	1.6575	.47258	1180
FrequentStoreVisit	4.6347	.51407	1180
AtVisitRepurchase	4.6322	.51638	1180
ContinuePurchase	4.6356	.49877	1180
MultiplePurchase	4.6551	.48086	1180

**Correlations**

		AdhereLongTerm	FrequentStoreVisit	AtVisitRepurchase	ContinuePurchase
Pearson Correlation	AdhereLongTerm	1.000	.779	.782	.763
	FrequentStoreVisit	.779	1.000	.970	.857
	AtVisitRepurchase	.782	.970	1.000	.866
	ContinuePurchase	.763	.857	.866	1.000
	MultiplePurchase	.768	.859	.865	.894
Sig. (1-tailed)	AdhereLongTerm	.	.000	.000	.000
	FrequentStoreVisit	.000	.	.000	.000
	AtVisitRepurchase	.000	.000	.	.000
	ContinuePurchase	.000	.000	.000	.
	MultiplePurchase	.000	.000	.000	.000
N	AdhereLongTerm	1180	1180	1180	1180



FrequentStoreVisit	1180	1180	1180	1180
AtVisitRepurchase	1180	1180	1180	1180
ContinuePurchase	1180	1180	1180	1180
MultiplePurchase	1180	1180	1180	1180

**ANOVA<sup>a</sup>**

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	172.141	4	43.035	554.670	.000 <sup>b</sup>
	Residual	91.165	1175	.078		
	Total	263.306	1179			

a. Dependent Variable: AdhereLongTerm

b. Predictors: (Constant), MultiplePurchase, FrequentStoreVisit, ContinuePurchase, AtVisitRepurchase

**Coefficients<sup>a</sup>**

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	99.0% Lower Bound
		B	Std. Error	Beta			
1	(Constant)	-2.042	.080		-25.479	.000	-2.24
	FrequentStoreVisit	.189	.066	.206	2.887	.004	.020
	AtVisitRepurchase	.193	.067	.211	2.861	.004	.019
	ContinuePurchase	.183	.040	.193	4.598	.000	.080
	MultiplePurchase	.232	.041	.236	5.611	.000	.125

a. Dependent Variable: AdhereLongTerm

**Model Summary**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.809 <sup>a</sup>	.654	.653	.27854

a. Predictors: (Constant), MultiplePurchase, FrequentStoreVisit, ContinuePurchase, AtVisitRepurchase

With  $R^2$ , all of predictors can account for 65.4% of all variables in multiple regression involved.

## Consumer Satisfaction and Consumer Adherence

### Descriptive Statistics

	Mean	Std. Deviation	N
SatisfactoryAfterEducate	1.6575	.47258	1180
AdhereToCounsel	4.6483	.50699	1180
SatisfactoryLanguage	4.6432	.48102	1180
UnderstoodCare	4.6271	.51765	1180
AnswerSatisfactory	4.6364	.49513	1180

### Correlations

		Satisfactory After Educate	Adhere To Counsel	Satisfactory Language	Understood Care	Answer Satisfactory
Pearson Correlation	SatisfactoryAfterEducate	1.000	.679	.754	.749	.752
	AdhereToCounsel	.679	1.000	.803	.854	.798
	SatisfactoryLanguage	.754	.803	1.000	.920	.919
	UnderstoodCare	.749	.854	.920	1.000	.894
	AnswerSatisfactory	.752	.798	.919	.894	1.000
Sig. (1-tailed)	SatisfactoryAfterEducate	.	.000	.000	.000	.000
	AdhereToCounsel	.000	.	.000	.000	.000
	SatisfactoryLanguage	.000	.000	.	.000	.000
	UnderstoodCare	.000	.000	.000	.	.000
	AnswerSatisfactory	.000	.000	.000	.000	.
N	SatisfactoryAfterEducate	1180	1180	1180	1180	1180
	AdhereToCounsel	1180	1180	1180	1180	1180
	SatisfactoryLanguage	1180	1180	1180	1180	1180
	UnderstoodCare	1180	1180	1180	1180	1180
	AnswerSatisfactory	1180	1180	1180	1180	1180

**ANOVA<sup>a</sup>**

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	158.716	4	39.679	445.766	.000 <sup>b</sup>
	Residual	104.590	1175	.089		
	Total	263.306	1179			

a. Dependent Variable: SatisfactoryAfterEducate

b. Predictors: (Constant), AnswerSatisfactory, AdhereToCounsel, UnderstoodCare, SatisfactoryLanguage

**Coefficients<sup>a</sup>**

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	99.0% Confidence Interval for B		
	B	Std. Error	Beta			Lower Bound	Upper Bound	
1 (Constant)	-1.917	.088		21.828	.000	-2.143	-1.690	
	AdhereToCounsel	.090	.033	.097	2.708	.007	.004	.176
	SatisfactoryLanguage	.230	.055	.234	4.182	.000	.088	.372
	UnderstoodCare	.181	.050	.199	3.595	.000	.051	.311
	AnswerSatisfactory	.269	.047	.282	5.706	.000	.147	.390

a. Dependent Variable: SatisfactoryAfterEducate

**Model Summary**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.776 <sup>a</sup>	.603	.601	.29835

a. Predictors: (Constant), AnswerSatisfactory, AdhereToCounsel, UnderstoodCare, SatisfactoryLanguage

With  $R^2$ , all of predictors can account for 60.3% of all variables in multiple regression involved.

## Sale Promotion and Consumer Adherence

### Descriptive Statistics

	Mean	Std. Deviation	N
AdhereLongTerm	1.6606	.47120	1180
QualityPriceAdhere	4.6441	.47900	1180
PurchaseFromGoodPromotion	4.6280	.51580	1180
PriceAffectDecision	4.6347	.49559	1180
MultipleVisitFromPromotion	4.6517	.47841	1180

### Correlations

	AdhereLongTerm	QualityPriceAdhere	PurchaseFromGoodPromotion	PriceAffectDecision	MultipleVisitFromPromotion
Pearson Correlation	AdhereLongTerm	QualityPriceAdhere	PurchaseFromGoodPromotion	PriceAffectDecision	MultipleVisitFromPromotion
	1.000	.769	.763	.759	.758
	.769	1.000	.933	.924	.909
	.763	.933	1.000	.898	.897
	.759	.924	.898	1.000	.930
	.758	.909	.897	.930	1.000
Sig. (1-tailed)	AdhereLongTerm	QualityPriceAdhere	PurchaseFromGoodPromotion	PriceAffectDecision	MultipleVisitFromPromotion
	.000	.000	.000	.000	.000
	.000	.000	.000	.000	.000
	.000	.000	.000	.000	.000
	.000	.000	.000	.000	.000
	.000	.000	.000	.000	.000
N	AdhereLongTerm	QualityPriceAdhere	PurchaseFromGoodPromotion	PriceAffectDecision	MultipleVisitFromPromotion
	1180	1180	1180	1180	1180
	1180	1180	1180	1180	1180
	1180	1180	1180	1180	1180

PriceAffectDecision	1180	1180	1180	1180	1180
MultipleVisitFromPromotion	1180	1180	1180	1180	1180

**ANOVA<sup>a</sup>**

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	162.492	4	40.623	480.805	.000 <sup>b</sup>
	Residual	99.275	1175	.084		
	Total	261.768	1179			

a. Dependent Variable: AdhereLongTerm

b. Predictors: (Constant), MultipleVisitFromPromotion, PurchaseFromGoodPromotion, PriceAffectDecision, QualityPriceAdhere

**Coefficients<sup>a</sup>**

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	99.0% Confidence Interval for B	
	B	Std. Error	Beta			Lower Bound	Upper Bound
1 (Constant)	-1.956	.085		-23.020	.000	-2.175	-1.736
QualityPriceAdhere	.227	.059	.231	3.832	.000	.074	.380
PurchaseFromGoodPromotion	.215	.048	.235	4.436	.000	.090	.340
PriceAffectDecision	.145	.054	.152	2.667	.008	.005	.285
MultipleVisitFromPromotion	.192	.053	.195	3.644	.000	.056	.329

a. Dependent Variable: AdhereLongTerm

**Model Summary**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.788 <sup>a</sup>	.621	.619	.29067

a. Predictors: (Constant), MultipleVisitFromPromotion, PurchaseFromGoodPromotion, PriceAffectDecision, QualityPriceAdhere

With  $R^2$ , all of predictors can account for 62.1% of all variables in multiple regression involved.

## Product Knowledge and Consumer Adherence

### Descriptive Statistics

	Mean	Std. Deviation	N
LongTermUseAdhere	1.6626	.47085	1180
PerceiveKnowledgeEncourage	4.6364	.49513	1180
MoreAdhereKnowProduction	4.6492	.47921	1180
UnderstandBenefits	4.6390	.50796	1180
KnownStandardizedQuality	4.6297	.51538	1180

### Correlations

	LongTermUseAdhere	PerceiveKnowledgeEncourage	MoreAdhereKnowProduction	UnderstandBenefits	KnownStandardizedQuality
Pearson Correlation	1.000	.755	.761	.693	.759
		1.000	.931	.803	.895
			1.000	.803	.895
				1.000	.895
					1.000



	MoreAdhereKnowProduction	.761	.931	1.000	.789	.892
	UnderstandBenefits	.693	.803	.789	1.000	.869
	KnownStandardizedQuality	.759	.895	.892	.869	1.000
Sig. (1-tailed)	LongTermUseAdhere		.000	.000	.000	.000
	PerceiveKnowledgeEncourage	.000		.000	.000	.000
	MoreAdhereKnowProduction	.000	.000		.000	.000
	UnderstandBenefits	.000	.000	.000		.000
	KnownStandardizedQuality	.000	.000	.000	.000	
N	LongTermUseAdhere	1180	1180	1180	1180	1180
	PerceiveKnowledgeEncourage	1180	1180	1180	1180	1180
	MoreAdhereKnowProduction	1180	1180	1180	1180	1180
	UnderstandBenefits	1180	1180	1180	1180	1180
	KnownStandardizedQuality	1180	1180	1180	1180	1180

**ANOVA<sup>a</sup>**

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	161.301	4	40.325	473.420	.000 <sup>b</sup>
	Residual	100.085	1175	.085		
	Total	261.386	1179			

a. Dependent Variable: LongTermUseAdhere

b. Predictors: (Constant, KnownStandardizedQuality, UnderstandBenefits, MoreAdhereKnowProduction, PerceiveKnowledgeEncourage)

**Coefficients<sup>a</sup>**

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	99.0% Confidence Interval for B	
	B	Std. Error	Beta			Lower Bound	Upper Bound
1 (Constant)	-1.950	.086		-22.739	.000	-2.172	-1.729
PerceiveKnowledgeEncourage	.166	.051	.174	3.227	.001	.033	.298
MoreAdhereKnowProduction	.286	.052	.291	5.475	.000	.151	.420
UnderstandBenefits	.092	.034	.100	2.712	.007	.005	.180
KnownStandardizedQuality	.235	.047	.257	4.989	.000	.113	.357

a. Dependent Variable: LongTermUseAdhere

#### Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.786 <sup>a</sup>	.617	.616	.29185

a. Predictors: (Constant), KnownStandardizedQuality, UnderstandBenefits, MoreAdhereKnowProduction, PerceiveKnowledgeEncourage

With  $R^2$ , all of predictors can account for 61.7% of all variables in multiple regression involved.

### Consumer Adherence and Retail Sales Performance

#### Descriptive Statistics

	Mean	Std. Deviation	N
RefillAbilityForAdherence	1.6606	.47120	1180
SupplyChainInfo	4.6517	.47841	1180
SalePerformance	4.6347	.49559	1180
LongTermAdherence	4.6441	.47900	1180
EfficientConsumerAdherence	4.6288	.51559	1180

**Correlations**

	RefillAbilityForAdherence	SupplyChainInfo	SalePerformance	LongTermAdherence	EfficientConsumerAdherence
Pearson Correlation	1.000	.758	.759	.769	.761
RefillAbilityForAdherence					
SupplyChainInfo	.758	1.000	.930	.909	.899
SalePerformance	.759	.930	1.000	.924	.896
LongTermAdherence	.769	.909	.924	1.000	.931
EfficientConsumerAdherence	.761	.899	.896	.931	1.000
Sig. (1-tailed)					
RefillAbilityForAdherence		.000	.000	.000	.000
SupplyChainInfo	.000		.000	.000	.000
SalePerformance	.000	.000		.000	.000
LongTermAdherence	.000	.000	.000		.000
EfficientConsumerAdherence	.000	.000	.000	.000	
N					
RefillAbilityForAdherence	1180	1180	1180	1180	1180
SupplyChainInfo	1180	1180	1180	1180	1180
SalePerformance	1180	1180	1180	1180	1180
LongTermAdherence	1180	1180	1180	1180	1180
EfficientConsumerAdherence	1180	1180	1180	1180	1180

**ANOVA<sup>a</sup>**

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	162.302	4	40.576	479.327	.000 <sup>b</sup>
	Residual	99.465	1175	.085		
	Total	261.768	1179			

a. Dependent Variable: RefillAbilityForAdherence

b. Predictors: (Constant), EfficientConsumerAdherence, SalePerformance, SupplyChainInfo, LongTermAdherence

**Coefficients<sup>a</sup>**

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	99.0% Confidence Interval for B	
	B	Std. Error	Beta			Lower Bound	Upper Bound
1 (Constant)	-1.958	.085		23.037	.000	-2.178	-1.739
SupplyChainInfo	.190	.053	.193	3.572	.000	.053	.327
SalePerformance	.150	.054	.158	2.764	.006	.010	.290
LongTermAdherence	.239	.059	.243	4.062	.000	.087	.391
EfficientConsumerAdherence	.201	.048	.220	4.171	.000	.077	.325

a. Dependent Variable: RefillAbilityForAdherence

**Model Summary**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.787 <sup>a</sup>	.620	.619	.29095

a. Predictors: (Constant), EfficientConsumerAdherence, SalePerformance, SupplyChainInfo, LongTermAdherence

With  $R^2$ , all of predictors can account for 62% of all variables in multiple regression involved.

**Retail Stocking Efficiency Affecting Retail Sales Performance****Descriptive Statistics**

	Mean	Std. Deviation	N
SalePerformance	1.6558	.47314	1180
SupplyChainInformationSharing	4.6576	.48004	1180



	RetailOperationEfficiency	.000	.000	.000	.000	.000	.000
	StockingForecastRefill	.000	.000	.000	.000	.000	.000
	SupplyChainEfficiency	.000	.000	.000	.000	.000	.000
	WarehouseSupplyChainForecast	.000	.000	.000	.000	.000	.000
N	SalePerformance	1180	1180	1180	1180	1180	1180
	SupplyChainInformationSharing	1180	1180	1180	1180	1180	1180
	RefillEfficiencyForAdherence	1180	1180	1180	1180	1180	1180
	RetailOperationEfficiency	1180	1180	1180	1180	1180	1180
	StockingForecastRefill	1180	1180	1180	1180	1180	1180
	SupplyChainEfficiency	1180	1180	1180	1180	1180	1180
	WarehouseSupplyChainForecast	1180	1180	1180	1180	1180	1180

**Model Summary**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.811 <sup>a</sup>	.658	.656	.27751

a. Predictors: (Constant), WarehouseSupplyChainForecast, StockingForecastRefill, SupplyChainInformationSharing, SupplyChainEfficiency, RefillEfficiencyForAdherence, RetailOperationEfficiency

**ANOVA<sup>a</sup>**



Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	173.595	6	28.933	375.679	.000 <sup>b</sup>
	Residual	90.337	1173	.077		
	Total	263.933	1179			

a. Dependent Variable: SalePerformance

b. Predictors: (Constant), WarehouseSupplyChainForecast, StockingForecastRefill, SupplyChainInformationSharing, SupplyChainEfficiency, RefillEfficiencyForAdherence, RetailOperationEfficiency

#### Coefficients<sup>a</sup>

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	99.0% Confidence Interval for B	
	B	Std. Error	Beta			Lower Bound	Upper Bound
1 (Constant)	-2.144	.084		-25.537	.000	-2.361	-1.928
SupplyChainInformationSharing	.215	.041	.218	5.218	.000	.109	.322
RefillEfficiencyForAdherence	.183	.043	.199	4.219	.000	.071	.295
RetailOperationEfficiency	-.245	.080	-.257	-3.066	.002	-.451	-.039
StockingForecastRefill	.098	.030	.104	3.257	.001	.020	.175
SupplyChainEfficiency	.210	.045	.214	4.650	.000	.093	.326
WarehouseSupplyChainForecast	.358	.086	.378	4.186	.000	.138	.579

a. Dependent Variable: SalePerformance

With  $R^2$ , all of predictors can account for 65.8% of all variables in multiple regression involved.

## Retail Sales Performance affecting Retail Profit Performance

#### Descriptive Statistics

	Mean	Std. Deviation	N

ProfitPerformance	1.6558	.47314	1180
SalePerformance	4.6517	.47664	1180
IncreaseProfitInTime	4.6593	.47592	1180
RegionalProfit	4.6407	.49394	1180
SustainProfit	4.6364	.51197	1180
SalePromotion	4.6492	.50338	1180

### Correlations

	ProfitPerfor mance	SalePerfor mance	IncreaseProfit InTime	Regional Profit	Sustain Profit	SaleProm otion
Pearso n Correla tion	ProfitPerform ance	.800	.783	.785	.795	.721
	SalePerforma nce	1.000	.897	.916	.927	.819
	IncreaseProfit InTime	.783	1.000	.926	.887	.779
	RegionalProfit	.785	.926	1.000	.888	.792
	SustainProfit	.795	.887	.888	1.000	.867
	SalePromotio n	.721	.779	.792	.867	1.000
Sig. (1- tailed)	ProfitPerform ance	.000	.000	.000	.000	.000
	SalePerforma nce	.000	.000	.000	.000	.000
	IncreaseProfit InTime	.000	.000	.000	.000	.000
	RegionalProfit	.000	.000	.000	.000	.000
	SustainProfit	.000	.000	.000	.000	.000
	SalePromotio n	.000	.000	.000	.000	.000
N	ProfitPerform ance	1180	1180	1180	1180	1180
	SalePerforma nce	1180	1180	1180	1180	1180
	IncreaseProfit InTime	1180	1180	1180	1180	1180
	RegionalProfit	1180	1180	1180	1180	1180
	SustainProfit	1180	1180	1180	1180	1180

SalePromotion	1180	1180	1180	1180	1180	1180
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**ANOVA<sup>a</sup>**

Model	Sum of Squares	df	Mean Square	F	Sig.
1 Regression	178.306	5	35.661	488.943	.000 <sup>b</sup>
Residual	85.626	1174	.073		
Total	263.933	1179			

a. Dependent Variable: ProfitPerformance

b. Predictors: (Constant), SalePromotion, IncreaseProfitInTime, SalePerformance, RegionalProfit, SustainProfit

**Coefficients<sup>a</sup>**

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	99.0% Confidence Interval for B	
	B	Std. Error	Beta			Lower Bound	Upper Bound
1 (Constant)	-.2214	.082		-27.011	.000	-2.425	-2.002
SalePerformance	.251	.053	.252	4.763	.000	.115	.386
IncreaseProfitInTime	.183	.048	.184	3.859	.000	.061	.306
RegionalProfit	.129	.049	.135	2.615	.009	.002	.256
SustainProfit	.180	.049	.195	3.654	.000	.053	.308
SalePromotion	.089	.032	.095	2.827	.005	.008	.171

a. Dependent Variable: ProfitPerformance

**Model Summary**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.822 <sup>a</sup>	.676	.674	.27007

a. Predictors: (Constant), SalePromotion, IncreaseProfitInTime, SalePerformance, RegionalProfit, SustainProfit

With R<sup>2</sup>, all of predictors can account for 67.6% of all variables in multiple regression involved.

## Retail Sales Efficiency and Retail Profit Performance

### Descriptive Statistics

	Mean	Std. Deviation	N
ProfitPerformance	1.6542	.47354	1180
EfficientSaleContinuousProfit Performance	4.6331	.51451	1180
LongTermAdherencePriceP erformance	4.6415	.50558	1180
EfficientConsumerAdherenc e	4.6458	.48552	1180
EfficientSaleIncreaseAdhere nce	4.6339	.51429	1180
EfficientSalePricePerforman ce	4.6373	.49831	1180
StockRefillEfficiency	4.6551	.48086	1180
ContinuousSalePromotion	4.6347	.51407	1180

### Correlations

	Profi tPerf orm ance	EfficientSale ContinuousPr ofitPerforma nce	LongTermA dherencePr icePerform ance	Efficient Consum erAdher ence	EfficientS aleIncrea seAdhere nce	Efficient SalePric ePerfor mance	Stock Refill Effici ency	Contin uousSa leProm otion
Pe ar so n C orr el ati on	1.00 0	.776	.697	.773	.774	.752	.761	.772
ProfitPerfor mance								
EfficientSale ContinuousPr ofitPerforma nce	.776	1.000	.837	.895	.995	.850	.856	.997
LongTermA dherencePri cePerforma nce	.697	.837	1.000	.792	.839	.756	.747	.840
EfficientCon sumerAdher ence	.773	.895	.792	1.000	.897	.874	.864	.898



EfficientSale ContinuousPr ofitPerforma nce	1180	1180	1180	1180	1180	1180	1180	1180
LongTermA dherencePri cePerforma nce	1180	1180	1180	1180	1180	1180	1180	1180
EfficientCon sumerAdher ence	1180	1180	1180	1180	1180	1180	1180	1180
EfficientSale IncreaseAd herence	1180	1180	1180	1180	1180	1180	1180	1180
EfficientSale PricePerfor mance	1180	1180	1180	1180	1180	1180	1180	1180
StockRefillE fficiency	1180	1180	1180	1180	1180	1180	1180	1180
Continuous SalePromoti on	1180	1180	1180	1180	1180	1180	1180	1180

**Model Summary**

Model	R	R Square	Adjusted Square	R	Std. Error of the Estimate
1	.813 <sup>a</sup>	.661	.659		.27651

a. Predictors: (Constant), ContinuousSalePromotion, LongTermAdherencePricePerformance, EfficientSalePricePerformance, StockRefillEfficiency, EfficientConsumerAdherence, EfficientSaleContinuousProfitPerformance, EfficientSaleIncreaseAdherence

**ANOVA<sup>a</sup>**

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	174.770	7	24.967	326.549	.000 <sup>b</sup>
	Residual	89.608	1172	.076		



Total	264.379	1179			
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a. Dependent Variable: ProfitPerformance

b. Predictors: (Constant), ContinuousSalePromotion, LongTermAdherencePricePerformance, EfficientSalePricePerformance, StockRefillEfficiency, EfficientConsumerAdherence, EfficientSaleContinousProfitPerformance, EfficientSaleIncreaseAdherence

**Coefficients<sup>a</sup>**

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	99.0% Confidence Interval for B	
	B	Std. Error	Beta			Lower Bound	Upper Bound
1 (Constant)	2.179	.083		26.234	.000	-2.393	-1.965
EfficientSaleContinousProfitPerformance	.951	.196	1.033	4.855	.000	.445	1.456
LongTermAdherencePricePerformance	.098	.030	.104	3.278	.001	.021	.175
EfficientConsumerAdherence	.217	.044	.223	4.967	.000	.104	.330
EfficientSaleIncreaseAdherence	.951	.277	1.032	3.436	.001	.237	1.665
EfficientSalePricePerformance	.112	.040	.117	2.761	.006	.007	.216
StockRefillEfficiency	.215	.041	.218	5.220	.000	.109	.321
ContinuousSalePromotion	-1.717	.342	-1.864	-5.019	.000	-2.599	-.834

a. Dependent Variable: ProfitPerformance

With R<sup>2</sup>, all of predictors can account for 66.1% of all variables in multiple regression involved.

**HYPOTHESIS GROUP 2**

**Retailer Stocking Efficiency affects Efficient Production Strategy**

**Descriptive Statistics**

	Mean	Std. Deviation	N
ProductionStrategy	1.6396	.47522	1180
RetailRestockStrategy	4.6339	.49239	1180
RetailSynchronizeStock	4.6229	.52840	1180
SynchronizeDisruptionMinimize	4.6280	.50918	1180
RetailSynchronizeStrategicProduction	4.6551	.48613	1180
WarehouseSustainable	4.6415	.49025	1180
EfficientRetailWareHouse	4.6364	.51197	1180
StrategicWarehouseSynchronize	4.6568	.49424	1180
DeliveryStrategicForecast	4.6559	.47526	1180
ManufactureForecastStock	4.6415	.48503	1180

**Correlations**

	ProductionStrategy	RetailRestockStrategy	RetailSynchronizeStock	SynchronizeDisruptionMinimize	RetailSynchronizeStrategicProduction	WarehouseSustainable	EfficientRetailWareHouse	StrategicWarehouseSynchronize	DeliveryStrategicForecast	ManufactureForecastStock
ProductionStrategy	1.000	.745	.747	.734	.728	.748	.674	.699	.765	.742
RetailRestockStrategy	.745	1.000	.809	.931	.858	.854	.740	.863	.864	.974
RetailSynchronizeStock	.747	.809	1.000	.790	.804	.859	.797	.745	.922	.826





Strategic WarehouseSynchronizeDeliveryStrategicForecastManufactureForecastStock	1180	1180	1180	1180	1180	1180	1180	1180	1180	1180
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**Model Summary**

Model	R	R Square	Adjusted Square	R	Std. Error of the Estimate
1	.802 <sup>a</sup>	.643	.641		.28493

a. Predictors: (Constant), ManufactureForecastStock, EfficientRetailWareHouse, RetailSynchronizeStock, StrategicWarehouseSynchronize, ReteilSynchronizeStrategicProduction, WarehouseSustainable, SynchronizeDisruptionMinimize, DeliveryStrategicForecast, RetailRestockStrategy

**ANOVA<sup>a</sup>**

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	171.276	9	19.031	234.415	.000 <sup>b</sup>
	Residual	94.985	1170	.081		
	Total	266.260	1179			

a. Dependent Variable: ProductionStrategy

b. Predictors: (Constant), ManufactureForecastStock, EfficientRetailWareHouse, RetailSynchronizeStock, StrategicWarehouseSynchronize, ReteilSynchronizeStrategicProduction, WarehouseSustainable, SynchronizeDisruptionMinimize, DeliveryStrategicForecast, RetailRestockStrategy

**Coefficients<sup>a</sup>**

Model	Unstandardized Coefficients	Standardized Coefficients	t	Sig.
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		B	Std. Error	Beta		
1	(Constant)	-2.213	.088		-25.078	.000
	RetailRestockStrategy	.280	.075	.290	3.721	.000
	RetailSynchronizeStock	.147	.043	.163	3.396	.001
	SynchronizeDisruptionMinimize	.157	.051	.168	3.100	.002
	RetailSynchronizeStrategicProduction	.139	.038	.142	3.673	.000
	WarehouseSustainable	.132	.042	.136	3.119	.002
	EfficientRetailWareHouse	.091	.028	.099	3.226	.001
	StrategicWarehouseSynchronize	.114	.036	.118	3.141	.002
	DeliveryStrategicForecast	.149	.057	.149	2.604	.009
	ManufactureForecastStock	-.378	.091	-.386	-4.164	.000

a. Dependent Variable: ProductionStrategy

With  $R^2$ , all of predictors can account for 64.3% of all variables in multiple regression involved.

### Retail Order Fulfillment affect Efficient Production Operation

#### Descriptive Statistics

	Mean	Std. Deviation	N
ManufacturerFullfillDemand OnTime	1.6413	.47553	1180
SynchronizeOperationMeet Demand	4.6551	.48613	1180
SynchronizeOrderEfficientO peration	4.6364	.49169	1180
OrderRestockDemandMet	4.6492	.49830	1180
SupplyChainOperationEffici ent	4.6415	.49025	1180
SynchronizeOrderEfficientSt orage	4.6390	.51129	1180



EfficientManufacturingOnTime	4.6602	.48970	1180
EfficientSustainWhileDemandOnRise	4.6559	.47526	1180
EffectiveRefillOrderOperation	4.6432	.48453	1180

**Correlations**

	ManufacturerFullfillDemandOnTime	SynchronizeOperationMeetDemand	SynchronizeOrderEfficientOperation	OrderRestockDemandMet	SupplyChainOperationEfficient	SynchronizeOrderEfficientStorage	EfficientManufacturingOnTime	EfficientSustainWhileDemandOnRise	EffectiveRefillOrderOperation
ManufacturerFullfillDemandOnTime	1.000	.727	.741	.663	.750	.674	.700	.767	.740
SynchronizeOperationMeetDemand	.727	1.000	.852	.799	.826	.696	.790	.852	.874
SynchronizeOrderEfficientOperation	.741	.852	1.000	.888	.849	.739	.871	.858	.965
OrderRestockDemandMet	.663	.799	.888	1.000	.787	.674	.846	.801	.890
SupplyChainOperationEfficient	.750	.826	.849	.787	1.000	.759	.799	.894	.868
SynchronizeOrderEfficientStorage	.674	.696	.739	.674	.759	1.000	.699	.776	.757

Efficient Manufacturing On Time	.700	.790	.871	.846	.799	.699	1.000	.802	.890
Efficient Sustain While Demand On Rise	.767	.852	.858	.801	.894	.776	.802	1.000	.885
Effective Refill Order Operation	.740	.874	.965	.890	.868	.757	.890	.885	1.000
Single (1) Demand On Time		.000	.000	.000	.000	.000	.000	.000	.000
Statistical Synchronize Operation Meeting Demand	.000		.000	.000	.000	.000	.000	.000	.000
Synchronize Order Efficient Operation	.000	.000		.000	.000	.000	.000	.000	.000
Order Re-stock Demand Met	.000	.000	.000		.000	.000	.000	.000	.000
Supply Chain Operation Efficient	.000	.000	.000	.000		.000	.000	.000	.000
Synchronize Order Efficient Storage	.000	.000	.000	.000	.000		.000	.000	.000



Efficient Manufacturing On Time	1180	1180	1180	1180	1180	1180	1180	1180	1180
Efficient Sustain While Demand On Rise	1180	1180	1180	1180	1180	1180	1180	1180	1180
Effective Refill Order Operation	1180	1180	1180	1180	1180	1180	1180	1180	1180

**ANOVA<sup>a</sup>**

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	170.649	8	21.331	260.312	.000 <sup>b</sup>
	Residual	95.957	1171	.082		
	Total	266.605	1179			

a. Dependent Variable: ManufacturerFullfillDemandOnTime

b. Predictors: (Constant), EffectiveRefillOrderOperation, SynchronizeOrderEfficientStorage, SynchronizeOperationMeetDemand, SupplyChainOperationEfficient, OrderRestockDemandMet, EfficientManufacturingOnTime, EfficientSustainWhileDemandOnRise, SynchronizeOrderEfficientOperation

**Coefficients<sup>a</sup>**

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	99.0% Confidence Interval for B	
	B	Std. Error	Beta			Lower Bound	Upper Bound
1 (Constant)	-2.262	.088		-25.680	.000	-2.489	-2.034

SynchronizeOperationMeetDemand	.165	.038	.168	4.330	.00	.067	.263
SynchronizeOrderEfficientOperation	.315	.067	.326	4.728	.00	.143	.487
OrderRestockDemandMet	-.105	.039	-.110	-2.671	.00	-.206	-.004
SupplyChainOperationEfficient	.165	.042	.170	3.936	.00	.057	.272
SynchronizeOrderEfficientStorage	.117	.027	.125	4.312	.00	.047	.187
EfficientManufacturingOnTime	.139	.039	.143	3.564	.00	.038	.239
EfficientSustainWhileDemandOnRise	.287	.047	.287	6.049	.00	.165	.409
EffectiveRefillOrderOperation	-.243	.079	-.247	-3.068	.00	-.447	-.039

a. Dependent Variable: ManufacturerFullfillDemandOnTime

**Model Summary**

Model	R	R Square	Adjusted Square	Std. Error of the Estimate
1	.800 <sup>a</sup>	.640	.638	.28626

a. Predictors: (Constant), EffectiveRefillOrderOperation, SynchronizeOrderEfficientStorage, SynchronizeOperationMeetDemand, SupplyChainOperationEfficient, OrderRestockDemandMet, EfficientManufacturingOnTime, EfficientSustainWhileDemandOnRise, SynchronizeOrderEfficientOperation

With R<sup>2</sup>, all of predictors can account for 64% of all variables in multiple regression involved.

**Retailer Stocking Efficiency affect Efficient Manufacturer Warehouse Strategy**

**Descriptive Statistics**

	Mean	Std. Deviation	N
WarehouseStrategyEfficient	1.6413	.47553	1180
RetailStockingEfficiency	4.6661	.49290	1180
StrategicEfficientDelivery	4.6585	.47976	1180
SupplyChainEfficient	4.6381	.49122	1180
RetailLogisticStrategy	4.6475	.50890	1180
EfficientLogisticStrategy	4.6602	.48970	1180

**Correlations**

	WarehouseStrategyEfficient	RetailStockingEfficiency	StrategicEfficientDelivery	SupplyChainEfficient	RetailLogisticStrategy	EfficientLogisticStrategy
Pearson Correlation	1.000	.635	.730	.737	.665	.700
WarehouseStrategyEfficient						
RetailStockingEfficiency	.635	1.000	.844	.856	.677	.837
StrategicEfficientDelivery	.730	.844	1.000	.936	.722	.892
SupplyChainEfficient	.737	.856	.936	1.000	.728	.874
RetailLogisticStrategy	.665	.677	.722	.728	1.000	.693
EfficientLogisticStrategy	.700	.837	.892	.874	.693	1.000
Sig. (1-tailed)						
WarehouseStrategyEfficient		.000	.000	.000	.000	.000
RetailStockingEfficiency	.000		.000	.000	.000	.000
StrategicEfficientDelivery	.000	.000		.000	.000	.000
SupplyChainEfficient	.000	.000	.000		.000	.000
RetailLogisticStrategy	.000	.000	.000	.000		.000



	EfficientLogisticStrategy	.000	.000	.000	.000	.000	.
N	WarehouseStrategyEfficient	1180	1180	1180	1180	1180	1180
	RetailStockingEfficiency	1180	1180	1180	1180	1180	1180
	StrategicEfficientDelivery	1180	1180	1180	1180	1180	1180
	SupplyChainEfficient	1180	1180	1180	1180	1180	1180
	RetailLogisticStrategy	1180	1180	1180	1180	1180	1180
	EfficientLogisticStrategy	1180	1180	1180	1180	1180	1180

**Model Summary**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.769 <sup>a</sup>	.592	.590	.30449

a. Predictors: (Constant), EfficientLogisticStrategy, RetailLogisticStrategy, RetailStockingEfficiency, SupplyChainEfficient, StrategicEfficientDelivery

**ANOVA<sup>a</sup>**

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	157.758	5	31.552	340.306	.000 <sup>b</sup>
	Residual	108.847	1174	.093		
	Total	266.605	1179			

a. Dependent Variable: WarehouseStrategyEfficient

b. Predictors: (Constant), EfficientLogisticStrategy, RetailLogisticStrategy, RetailStockingEfficiency, SupplyChainEfficient, StrategicEfficientDelivery

**Coefficients<sup>a</sup>**

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	99.0% Confidence Interval for B	
	B	Std. Error	Beta			Lower Bound	Upper Bound
1 (Constant)	-2.034	.093		-21.976	.000	-2.273	-1.796
RetailStockingEfficiency	-.117	.038	-.121	-3.113	.002	-.214	-.020
StrategicEfficientDelivery	.186	.059	.188	3.162	.002	.034	.338
SupplyChainEfficient	.327	.056	.338	5.836	.000	.183	.472
RetailLogisticStrategy	.235	.026	.252	9.028	.000	.168	.302
EfficientLogisticStrategy	.159	.043	.164	3.686	.000	.048	.271

a. Dependent Variable: WarehouseStrategyEfficient

With R<sup>2</sup>, all of predictors can account for 59.2% of all variables in multiple regression involved.

### Retailer Stocking Efficiency affects Efficient Manufacturer Warehouse Operation

#### Descriptive Statistics

	Mean	Std. Deviation	N
EfficientWarehouseOperationStrategy	4.6390	.51129	1180
RetailStockingEfficiency	1.6413	.47553	1180
EfficientDelivery	4.6627	.48362	1180
WarehouseEfficiencyPerforms	4.6475	.48850	1180
StockingMeetUrgentMarket	4.6678	.49233	1180
WarehouseDeliveryOnTime	4.6390	.49098	1180

#### Correlations



**ANOVA<sup>a</sup>**

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	191.950	5	38.390	387.677	.000 <sup>b</sup>
	Residual	116.256	1174	.099		
	Total	308.207	1179			

a. Dependent Variable: EfficientWarehouseOperationStrategy

b. Predictors: (Constant), WarehouseDeliveryOnTime, RetailStockingEfficiency, StockingMeetUrgentMarket, EfficientDelivery, WarehouseEfficiencyPerforms

**Coefficients<sup>a</sup>**

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	99.0% Confidence Interval for B	
	B	Std. Error	Beta			Lower Bound	Upper Bound
1 (Constant)	.913	.117		7.826	.000	.612	1.213
RetailStockingEfficiency	.171	.031	.159	5.472	.000	.090	.251
EfficientDelivery	.118	.037	.112	3.164	.002	.022	.214
WarehouseEfficiencyPerforms	.362	.038	.346	9.527	.000	.264	.460
StockingMeetUrgentMarket	.107	.035	.103	3.053	.002	.017	.198
WarehouseDeliveryOnTime	.154	.047	.148	3.259	.001	.032	.276

a. Dependent Variable: EfficientWarehouseOperationStrategy

**Model Summary**

Model	R	R Square	Adjusted Square	R	Std. Error of the Estimate
1	.789 <sup>a</sup>	.623	.621		.31468

a. Predictors: (Constant), WarehouseDeliveryOnTime, RetailStockingEfficiency, StockingMeetUrgentMarket, EfficientDelivery, WarehouseEfficiencyPerforms

With  $R^2$ , all of predictors can account for 62.3% of all variables in multiple regression involved.

### Retailer Order Fulfillment affect Efficient Logistic Strategy

#### Descriptive Statistics

	Mean	Std. Deviation	N
EfficientLogisticStrategy	1.6413	.47553	1180
OrderCreatesStrategy	4.6424	.48478	1180
EffectiveLogisticStrategy	4.6364	.49169	1180
VisibilityReStockingOrder	4.6551	.48613	1180
WarehouseReorder	4.6415	.49025	1180
ReorderEffective	4.6602	.48970	1180
HighDemandReorder	4.6559	.47526	1180
ForecastRetailReOrder	4.6492	.49830	1180

#### Correlations

	EfficientL ogisticStr ategy	OrderCr eatesStr ategy	Effectivel ogisticStr ategy	VisibilityR eStocking Order	Wareh ouseRe order	Reord erEffe ctive	HighDe mandRe order	Forecast RetailRe Order
Pea rso n Cor rela tion	EfficientL ogisticStr ategy	OrderCr eatesStr ategy	Effectivel ogisticStr ategy	VisibilityR eStocking Order	Wareh ouseRe order	Reord erEffe ctive	HighDe mandRe order	Forecast RetailRe Order
	1.000	.738	.741	.727	.750	.700	.767	.663
	.738	1.000	.963	.873	.866	.888	.883	.888





N	EfficientL ogisticStr ategy	1180	1180	1180	1180	1180	1180	1180	1180
	OrderCre atesStrate gy	1180	1180	1180	1180	1180	1180	1180	1180
	EffectiveL ogisticStr ategy	1180	1180	1180	1180	1180	1180	1180	1180
	VisibilityR eStocking Order	1180	1180	1180	1180	1180	1180	1180	1180
	Warehous eReorder	1180	1180	1180	1180	1180	1180	1180	1180
	ReorderEf fective	1180	1180	1180	1180	1180	1180	1180	1180
	HighDem andReord er	1180	1180	1180	1180	1180	1180	1180	1180
	ForecastR etailReOr der	1180	1180	1180	1180	1180	1180	1180	1180

**ANOVA<sup>a</sup>**

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	169.108	7	24.158	290.403	.000 <sup>b</sup>
	Residual	97.497	1172	.083		
	Total	266.605	1179			

a. Dependent Variable: EfficientLogisticStrategy

b. Predictors: (Constant), ForecastRetailReOrder, WarehouseReorder, VisibilityReStockingOrder, ReorderEffective, HighDemandReorder, EffectiveLogisticStrategy, OrderCreatesStrategy

**Coefficients<sup>a</sup>**

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-2.196	.087		-25.114	.000
	OrderCreatesStrategy	-.211	.077	-.215	-2.756	.006

EffectiveLogisticStrategy	.320	.066	.331	4.847	.000
VisibilityReStockingOrder	.158	.038	.162	4.143	.000
WarehouseReorder	.192	.042	.198	4.604	.000
ReorderEffective	.147	.039	.151	3.763	.000
HighDemandReorder	.332	.046	.332	7.157	.000
ForecastRetailReOrder	-.113	.039	-.118	2.870	.004

a. Dependent Variable: EfficientLogisticStrategy

**Model Summary**

Model	R	R Square	Adjusted Square	R	Std. Error of the Estimate
1	.796 <sup>a</sup>	.634	.632		.28842

a. Predictors: (Constant), ForecastRetailReOrder, WarehouseReorder, VisibilityReStockingOrder, ReorderEffective, HighDemandReorder, EffectiveLogisticStrategy, OrderCreatesStrategy

With R<sup>2</sup>, all of predictors can account for 63.4% of all variables in multiple regression involved.

**Retail Order Fulfillment affect Efficient Logistic Operation**

**Descriptive Statistics**

	Mean	Std. Deviation	N
EfficientLogisticOperation	4.6559	.47526	1180
EffectiveLogisticStrategy	1.6413	.47553	1180
EffectiveSynchronizeLogistic	4.6695	.48129	1180
OrderCreatesEffectiveOperation	4.6525	.49727	1180

VisibilityReStockingOrder	4.6390	.51129	1180
WarehouseReorder	4.6415	.49025	1180
ReOrderEffective	4.6686	.48684	1180
HighDemandReOrder	4.6432	.48453	1180
ForecastRetailReOrder	4.6441	.48951	1180

### Correlations

	Efficient Logistic Operati on	Effectiv eLogisti cStrate gy	Effective Synchro nizeLogi stic	OrderCrea tesEffectiv eOperatio n	Visibility ReStoc kingOrd er	Ware house Reord er	ReO rder Effec tive	HighD emand ReOrd er	Foreca stRetai lReOrd er	
Pe ars on Co rre lati on	EfficientLo gisticOper ation	1.000	.767	.819	.800	.776	.894	.783	.885	.840
	EffectiveL ogisticStra tegy	.767	1.000	.709	.666	.674	.750	.685	.740	.730
	EffectiveS ynchroniz eLogistic	.819	.709	1.000	.778	.673	.799	.799	.843	.818
	OrderCrea tesEffectiv eOperatio n	.800	.666	.778	1.000	.667	.779	.820	.883	.861
	VisibilityR eStocking Order	.776	.674	.673	.667	1.000	.759	.681	.757	.737
	Warehous eReorder	.894	.750	.799	.779	.759	1.000	.785	.868	.832
	ReOrderE ffective	.783	.685	.799	.820	.681	.785	1.00 0	.872	.846
	HighDema ndReOrde r	.885	.740	.843	.883	.757	.868	.872	1.000	.948
	ForecastR etailReOr der	.840	.730	.818	.861	.737	.832	.846	.948	1.000



VisibilityReStockingOrder	1180	1180	1180	1180	1180	1180	1180	1180	1180
WarehouseReorder	1180	1180	1180	1180	1180	1180	1180	1180	1180
ReOrderEffective	1180	1180	1180	1180	1180	1180	1180	1180	1180
HighDemandReOrder	1180	1180	1180	1180	1180	1180	1180	1180	1180
ForecastRetailReOrder	1180	1180	1180	1180	1180	1180	1180	1180	1180

**ANOVA<sup>a</sup>**

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	230.704	8	28.838	948.461	.000 <sup>b</sup>
	Residual	35.604	1171	.030		
	Total	266.308	1179			

a. Dependent Variable: EfficientLogisticOperation

b. Predictors: (Constant), ForecastRetailReOrder, EffectiveLogisticStrategy, VisibilityReStockingOrder, EffectiveSynchronizeLogistic, ReOrderEffective, OrderCreatesEffectiveOperation, WarehouseReorder, HighDemandReOrder

**Coefficients<sup>a</sup>**

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	99.0% Confidence Interval for B	
	B	Std. Error	Beta			Lower Bound	Upper Bound
1 (Constant)	.433	.067		6.495	.000	.261	.605
EffectiveLogisticStrategy	.112	.017	.112	6.426	.000	.067	.156
EffectiveSynchronizeLogistic	.128	.021	.130	6.065	.000	.074	.183
OrderCreatesEffectiveOperation	.062	.023	.065	2.765	.006	.004	.121
VisibilityReStockingOrder	.118	.016	.127	7.241	.000	.076	.160
WarehouseReorder	.370	.023	.381	15.922	.000	.310	.429
ReOrderEffective	-.066	.023	-.067	-2.912	.004	-.124	-.007

HighDemandReOrder	.355	.042	.362	8.541	.000	.248	.462
ForecastRetailReOrder	-.097	.034	-.100	-2.903	.004	-.184	-.011

a. Dependent Variable: EfficientLogisticOperation

**Model Summary**

Model	R	R Square	Adjusted Square	R	Std. Error of the Estimate
1	.931 <sup>a</sup>	.866	.865		.17437

a. Predictors: (Constant), ForecastRetailReOrder, EffectiveLogisticStrategy, VisibilityReStockingOrder, EffectiveSynchronizelogistic, ReOrderEffective, OrderCreatesEffectiveOperation, WarehouseReorder, HighDemandReOrder

With R<sup>2</sup>, all of predictors can account for 86.6% of all variables in multiple regression involved.

**Retailer Order Fulfillment affect Operation Efficient Budget Expense**

**Descriptive Statistics**

	Mean	Std. Deviation	N
OperationEfficientlySaveExpense	16387	.47628	1180



RetailSynchronizeManufacturingOperation	4.6364	.49169	1180
SaveCostOperation	4.6534	.49701	1180
VisibilityReStockingOrder	4.6390	.51129	1180
WarehouseReorder	4.6415	.49025	1180
EffectiveOrderfulfillmentTiming	4.6432	.48453	1180
HighDemandReorder	4.6576	.48531	1180
ForecastRetailOrder	4.6559	.47526	1180
ForecastOperationOnDemand	4.6602	.48970	1180

**Correlations**

	Operation Efficiently Save Expenditure	RetailSynchronizeManufacturingOperation	Save Cost Operation	VisibilityReStockingOrder	WarehouseReorder	EffectiveOrderfulfillmentTiming	High DemandReorder	ForecastRetailOrder	ForecastOperationOnDemand
Operation Efficiently Save Expenditure	1.000	.736	.648	.669	.745	.735	.716	.762	.695
RetailSynchronizeManufacturingOperation	.736	1.000	.879	.739	.849	.965	.850	.858	.871
SaveCostOperation	.648	.879	1.000	.669	.778	.881	.788	.791	.854
VisibilityReStockingOrder	.669	.739	.669	1.000	.759	.757	.701	.776	.699
WarehouseReorder	.745	.849	.778	.759	1.000	.868	.821	.894	.799
EffectiveOrderfulfillmentTiming	.735	.965	.881	.757	.868	1.000	.876	.885	.890
HighDemandReorder	.716	.850	.788	.701	.821	.876	1.000	.846	.795



VisibilityRe									
StockingOrder	1180	1180	1180	1180	1180	1180	1180	1180	1180
Warehouse									
Reorder	1180	1180	1180	1180	1180	1180	1180	1180	1180
EffectiveOrder									
fulfillment	1180	1180	1180	1180	1180	1180	1180	1180	1180
Timing									
HighDemand									
Reorder	1180	1180	1180	1180	1180	1180	1180	1180	1180
ForecastRetail									
Order	1180	1180	1180	1180	1180	1180	1180	1180	1180
ForecastOperation									
OnDemand	1180	1180	1180	1180	1180	1180	1180	1180	1180

**ANOVA<sup>a</sup>**

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	168.801	8	21.100	250.480	.000 <sup>b</sup>
	Residual	98.644	1171	.084		
	Total	267.445	1179			

a. Dependent Variable: OperationEfficientlySaveExpenditure

b. Predictors: (Constant), ForecastOperationOnDemand, VisibilityReStockingOrder, HighDemandReorder, SaveCostOperation, WarehouseReorder, ForecastRetailOrder, RetailSynchronizeManufacturingOperation, EffectiveOrderfulfillmentTiming

**Coefficients<sup>a</sup>**

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	99.0% Confidence Interval for B	
	B	Std. Error	Beta			Lower Bound	Upper Bound
1 (Constant)	-2.232	.089		-24.944	.000	-2.463	-2.001

RetailSynchronizeManufacturingOperation	.326	.067	.337	4.844	.000	.153	.500
SaveCostOperation	-.119	.039	-.124	-3.059	.002	-.220	-.019
VisibilityReStockingOrder	.112	.027	.120	4.079	.000	.041	.183
WarehouseReorder	.168	.042	.173	3.964	.000	.059	.277
EffectiveOrderfulfillmentTiming	-.245	.080	-.249	-3.044	.002	-.452	-.037
HighDemandReorder	.145	.038	.148	3.789	.000	.046	.244
ForecastRetailOrder	.297	.048	.296	6.219	.000	.174	.420
ForecastOperationOnDemand	.149	.040	.153	3.685	.000	.045	.253

a. Dependent Variable: OperationEfficientlySaveExpenditure

**Model Summary**

Model	R	R Square	Adjusted Square	R	Std. Error of the Estimate
1	.794 <sup>a</sup>	.631	.629		.29024

a. Predictors: (Constant), ForecastOperationOnDemand, VisibilityReStockingOrder, HighDemandReorder, SaveCostOperation, WarehouseReorder, ForecastRetailOrder, RetailSynchronizeManufacturingOperation, EffectiveOrderfulfillmentTiming

With R<sup>2</sup>, all of predictors can account for 63.1% of all variables in multiple regression involved.

**Manufacturer Operation Strategy affects Efficient Retail Supply Chain Sustainability**

**Descriptive Statistics**

	Mean	Std. Deviation	N
EfficientRetailSupplyChainSustainable	1.6438	.47248	1180
PlanSynchronizeStrategy	4.6797	.49844	1180
ForecastMarketPlan	4.6517	.48720	1180
PurchaseRawMaterial	4.6398	.49074	1180
PurchaseEffectively	4.6559	.49622	1180
MarketGrowthSynchronize	4.6610	.48419	1180
DisruptionPrevention	4.6619	.47328	1180
StrategicProductionSynchronized	4.6627	.48886	1180
RawMaterialSustainable	4.6390	.51129	1180

**Correlations**

	EfficientRetailSupplyChainSustainable	PlanSynchronizeStrategy	ForecastMarketPlan	PurchaseRawMaterial	PurchaseEffectively	MarketGrowthSynchronize	DisruptionPrevention	StrategicProductionSynchronized	RawMaterialSustainable
EfficientRetailSupplyChainSustainable	1.000	.600	.739	.731	.648	.714	.754	.695	.672
PlanSynchronizeStrategy	.600	1.000	.693	.672	.596	.639	.691	.656	.920
ForecastMarketPlan	.739	.693	1.000	.834	.749	.826	.861	.788	.748
PurchaseRawMaterial	.731	.672	.834	1.000	.873	.856	.837	.858	.732
PurchaseEffectively	.648	.596	.749	.873	1.000	.796	.772	.836	.660
MarketGrowthSynchronize	.714	.639	.826	.856	.796	1.000	.824	.792	.694
DisruptionPrevention	.754	.691	.861	.837	.772	.824	1.000	.782	.767
StrategicProductionSynchronized	.695	.656	.788	.858	.836	.792	.782	1.000	.767
RawMaterialSustainable	.672	.920	.748	.732	.660	.694	.767	.767	1.000





PurchaseRawMaterial	1180	1180	1180	1180	1180	1180	1180	1180	1180
PurchaseEffectively	1180	1180	1180	1180	1180	1180	1180	1180	1180
MarketGrowthSynchronize	1180	1180	1180	1180	1180	1180	1180	1180	1180
DisruptionPrevention	1180	1180	1180	1180	1180	1180	1180	1180	1180
StrategicProductionSynchronized	1180	1180	1180	1180	1180	1180	1180	1180	1180
RawMaterialSustainable	1180	1180	1180	1180	1180	1180	1180	1180	1180

#### Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.794 <sup>a</sup>	.630	.628	.28824

a. Predictors: (Constant), RawMaterialSustainable, PurchaseEffectively, ForecastMarketPlan, MarketGrowthSynchronize, StrategicProductionSynchronized, DisruptionPrevention, PlanSynchronizeStrategy, PurchaseRawMaterial

#### ANOVA<sup>a</sup>

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	165.912	8	20.739	249.624	.000 <sup>b</sup>
	Residual	97.288	1171	.083		
	Total	263.200	1179			

a. Dependent Variable: EfficientRetailSupplyChainSustainable

b. Predictors: (Constant), RawMaterialSustainable, PurchaseEffectively, ForecastMarketPlan, MarketGrowthSynchronize, StrategicProductionSynchronized, DisruptionPrevention, PlanSynchronizeStrategy, PurchaseRawMaterial

#### Coefficients<sup>a</sup>

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	99.0% Confidence Interval for B	
	B	Std. Error	Beta			Lower Bound	Upper Bound
1 (Constant)	-2.176	.092		-23.582	.000	-2.414	-1.938
PlanSynchronizeStrategy	-.115	.044	-.122	-2.639	.008	-.228	-.003
ForecastMarketPlan	.159	.039	.164	4.043	.000	.057	.260
PurchaseRawMaterial	.153	.047	.159	3.217	.001	.030	.275
PurchaseEffectively	-.103	.038	-.108	-2.726	.007	-.200	-.005
MarketGrowthSynchronize	.114	.038	.117	3.003	.003	.016	.212
DisruptionPrevention	.258	.041	.259	6.237	.000	.152	.365
StrategicProductionSynchronized	.134	.037	.138	3.582	.000	.037	.230
RawMaterialSustainable	.222	.048	.240	4.643	.000	.099	.346

a. Dependent Variable: EfficientRetailSupplyChainSustainable

With R<sup>2</sup>, all of predictors can account for 59.1% of all variables in multiple regression involved.

**Synchronized Manufacturing Performance affects Retail Profit Performance**

**Descriptive Statistics**

	Mean	Std. Deviation	N
RetailProfitPerformance	1.6396	.47603	1180
SynchronizeProductionMeetRetailPerformance	4.6695	.49175	1180
ConsumerExpansionPerformance	4.6415	.51059	1180
ManufacturingMeetMarketGrowth	4.6432	.48453	1180

SynchronizeLogisticDisruptionPrevention	4.6644	.48305	1180
ManufacturingMeetProfitPerformance	4.6593	.47414	1180
ManufacturingMeetPromotionOrder	4.6602	.48970	1180
ManufacturingMeetMarketDemand	4.6390	.51129	1180
SynchronizeWarehouseEfficiencyMeetRetailPerformance	4.6364	.49169	1180

**Correlations**

	RetailProfitPerformance	SynchronizeProductionMeetRetailPerformance	ConsumerExpansionPerformance	ManufacturingMeetMarketGrowth	SynchronizeLogisticDisruptionPrevention	ManufacturingMeetProfitPerformance	ManufacturingMeetPromotionOrder	ManufacturingMeetMarketDemand	SynchronizeWarehouseEfficiencyMeetRetailPerformance
RetailProfitPerformance	1.000	.616	.665	.736	.710	.763	.697	.671	.737
SynchronizeProductionMeetRetailPerformance	.616	1.000	.649	.847	.750	.757	.801	.648	.846
ConsumerExpansionPerformance	.665	.649	1.000	.751	.702	.774	.693	.995	.734
ManufacturingMeetMarketGrowth	.736	.847	.751	1.000	.869	.877	.890	.757	.965
SynchronizeLogisticDisruptionPrevention	.710	.750	.702	.869	1.000	.822	.787	.697	.839
ManufacturingMeetProfitPerformance	.763	.757	.774	.877	.822	1.000	.822	.787	.839
ManufacturingMeetPromotionOrder	.697	.801	.693	.890	.787	.822	1.000	.822	.839
ManufacturingMeetMarketDemand	.671	.648	.995	.757	.697	.787	.822	1.000	.839
SynchronizeWarehouseEfficiencyMeetRetailPerformance	.737	.846	.734	.965	.839	.839	.839	.839	1.000

ManufacturingMeetProfitPerformance	.763	.757	.774	.877	.822	1.000	.794	.773	.851
ManufacturingMeetPromotionOrder	.697	.801	.693	.890	.787	.794	1.000	.699	.871
ManufacturingMeetMarketDemand	.671	.648	.995	.757	.697	.773	.699	1.000	.739
SynchronizeWarehouseEfficiency	.737	.846	.734	.965	.839	.851	.871	.739	1.000
MeetRetailPerformance									
S RetailProfit Performance		.000	.000	.000	.000	.000	.000	.000	.000
( SynchronizeProduction	.000		.000	.000	.000	.000	.000	.000	.000
- MeetRetailPerformance									
a ConsumerExpansionPerformance	.000	.000		.000	.000	.000	.000	.000	.000
d ManufacturingMarketGrowth	.000	.000	.000		.000	.000	.000	.000	.000
) SynchronizeLogisticDisruptionPrevention	.000	.000	.000	.000		.000	.000	.000	.000
ManufacturingMeetProfitPerformance	.000	.000	.000	.000	.000		.000	.000	.000



SynchronizeWarehouseEfficiencyMeetRetailPerformance	1180	1180	1180	1180	1180	1180	1180	1180	1180
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**ANOVA<sup>a</sup>**

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	169.536	8	21.192	254.179	.000 <sup>b</sup>
	Residual	97.631	1171	.083		
	Total	267.167	1179			

a. Dependent Variable: RetailProfitPerformance

b. Predictors: (Constant), SynchronizeWarehouseEfficiencyMeetRetailPerformance, ConsumerExpansionPerformance, SynchronizeProductionMeetRetailPerformance, SynchronizeLogisticDisruptionPrevention, ManufacturingMeetPromotionOrder, ManufacturingMeetProfitPerformance, ManufacturingMeetMarketGrowth, ManufacturingMeetMarketDemand

**Coefficients<sup>a</sup>**

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	99.0% Confidence Interval for B	
	B	Std. Error	Beta			Lower Bound	Upper Bound
1 (Constant)	2.231	.091		24.617	.000	2.465	1.997
SynchronizeProductionMeetRetailPerformance	-.107	.034	-.111	-3.190	.001	-.194	-.021



ConsumerExpansionPerformance	.474	.172	-.508	2.749	.006	-.919	-.029
ManufacturingMeetMarketGrowth	.255	.081	-.260	3.172	.002	-.463	-.048
SynchronizeLogisticDisruptionPrevention	.177	.037	.179	4.784	.000	.081	.272
ManufacturingMeetProfitPerformance	.406	.041	.404	9.978	.000	.301	.511
ManufacturingMeetPromotionOrder	.144	.039	.148	3.726	.000	.044	.244
ManufacturingMeetMarketDemand	.594	.173	.639	3.444	.001	.149	1.040
SynchronizeWarehouseEfficiencyMeetRetailPerformance	.348	.067	.360	5.230	.000	.176	.520

a. Dependent Variable: RetailProfitPerformance

**Model Summary**

Model	R	R Square	Adjusted Square	R	Std. Error of the Estimate
1	.797 <sup>a</sup>	.635	.632		.28875

a. Predictors: (Constant), SynchronizeWarehouseEfficiencyMeetRetailPerformance, ConsumerExpansionPerformance, SynchronizeProductionMeetRetailPerformance, SynchronizeLogisticDisruptionPrevention, ManufacturingMeetPromotionOrder, ManufacturingMeetProfitPerformance, ManufacturingMeetMarketGrowth, ManufacturingMeetMarketDemand

With  $R^2$ , all of predictors can account for 63.5% of all variables in multiple regression involved.









MachineEfficiencyMeetConsumerExpansionSynchronizeForecastMeetRetailDemographicGrowthProductionMeetsRetailOrderEfficiently	1180	1180	1180	1180	1180	1180	1180	1180	1180	1180
---	------	------	------	------	------	------	------	------	------	------

**ANOVA<sup>a</sup>**

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	141.663	9	15.740	137.748	.000 <sup>b</sup>
	Residual	133.694	1170	.114		
	Total	275.357	1179			

a. Dependent Variable: RetailProfitPerformance

b. Predictors: (Constant), ProductionMeetsRetailOrderEfficiently, EfficientWebSynchronizeProduction, SynchronizationBetweenWarehousesStocks, SynchronizeForecastMeetRetailDemographicGrowth, ManufacturingMeetMarketDemand, ManufacturingMeetPromotionOrder, MachineEfficiencyMeetConsumerExpansion, ManufacturingMeetMarketGrowth, ManufacturingOperationOnTime

**Coefficients<sup>a</sup>**

Model	Unstandardized Coefficients	Standardized Coefficients	t	Sig.	99.0% Confidence Interval for B



	B	Std. Error	Beta			Lower Bound	Upper Bound
1 (Constant)	-			-	.00	-	-
	1.990	.111		17.888	.00	2.277	1.703
ManufacturingMeetPromotionOrder	-.133	.049	-.129	-	.00	-.259	-.007
EfficientWebSynchronizeProduction	.251	.051	.259	4.945	.00	.120	.382
ManufacturingOperationOnTime	-.155	.056	-.160	-	.00	-.299	-.011
ManufacturingMeetMarketDemand	.133	.044	.132	3.043	.00	.020	.246
SynchronizationBetweenWarehousesStocks	.165	.045	.165	3.621	.00	.047	.282
ManufacturingMeetMarketGrowth	.158	.055	.160	2.892	.00	.017	.300
MachineEfficiencyMeetConsumerExpansion	.295	.052	.286	5.672	.00	.161	.429
SynchronizeForecastMeetRetailDemographicGrowth	.141	.043	.142	3.294	.00	.030	.251
ProductionMeetsRetailOrderEfficiently	-.084	.032	-.087	-	.00	-.167	-.001
				2.606	9		

a. Dependent Variable: RetailProfitPerformance

#### Model Summary

Model	R	R Square	Adjusted Square	R	Std. Error of the Estimate
1	.717 <sup>a</sup>	.514	.511		.33804

a. Predictors: (Constant), ProductionMeetsRetailOrderEfficiently, EfficientWebSynchronizeProduction, SynchronizationBetweenWarehousesStocks, SynchronizeForecastMeetRetailDemographicGrowth, ManufacturingMeetMarketDemand, ManufacturingMeetPromotionOrder, MachineEfficiencyMeetConsumerExpansion, ManufacturingMeetMarketGrowth, ManufacturingOperationOnTime

With  $R^2$ , all of predictors can account for 51.4% of all variables in multiple regression involved.

## APPENDIX B

### Correlation Tables and Statistics

#### COST-ADHERENCE MULTIPLE CORRELATION

##### Descriptive Statistics

	Mean	Std. Deviation	N
BottlePrice	1.6528	.47225	1268
SupplementAloneCostEffective	4.6427	.50347	1268
TravelExpenseAffectBasePurchase	4.6388	.51233	1268
TravelCostAffectPromotionBuy	4.6404	.51036	1268
BottlePriceAndContinuity	4.6577	.47962	1268
PricePerPillEconomical	4.6159	.54182	1268
CostEffectivePill	4.6459	.49465	1268
BottlePriceFitLifestyle	4.6498	.48214	1268

EconomicalWhenEffectiveIn Combination	4.6396	.50903	1268
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### Correlations

	Bottle Price	Supplement Alone CostEffective	TravelExpense Affect BasePurchase	TravelCost AffectP romotion Buy	BottleP riceAn dConti nuity	PriceP erPillE cono mical	Cos tEff ecti vePill	Bottle Price FitLife style	Economical WhenEffecti veInCombina tion
BottlePrice	Person Correlation Sig. (1-tailed)	.660**	.717**	.724**	.712**	.656**	.706**	.723**	.721**
		.000	.000	.000	.000	.000	.000	.000	.000







Sum of Squares and Cross-products Covariance Matrix N = 1268		269.377	332.571	307.293	266.240	281.096	270.822	280.628	308.932
TravelCostAffectPromotionBuy Pearson Correlation Significance (1-tailed)		.213	.262	.243	.210	.222	.214	.221	.244
		1268	1268	1268	1268	1268	1268	1268	1268
		.842**	.928**	1	.864**	.824**	.849**	.902**	.944**
		.000	.000		.000	.000	.000	.000	.000







Sum of Squares and Cross-products Covariance Matrix	21								
	254	262.017	281.096	288.864	254.314	371.958	243.553	255.473	284.480
N	12								
	68	1268	1268	1268	1268	1268	1268	1268	1268
CostEffectiveness Pill	Person								
Covariance Matrix	706								
	.756**	.843**	.849**	.889**	.717**	1	.873**	.903**	
Significance (1-tailed)	.000	.000	.000	.000	.000		.000	.000	





Sum of Squares	219.711	273.734	308.932	310.653	282.582	284.480	288.176	283.978	328.293
Cross-products	.173	.216	.244	.245	.223	.225	.227	.224	.259
N	1268	1268	1268	1268	1268	1268	1268	1268	1268

\*\* Correlation is significant at the 0.01 level (1-tailed).

## ADHERENCE-SATISFACTION CORRELATION

### Descriptive Statistics

	Mean	Std. Deviation	N
SatisfactoryPriceEffectiveness	1.6514	.47247	1268
ContinuousSatisfactoryPricing	4.6427	.49557	1268
BottlePriceEconomicalYear Round	4.6569	.47988	1268
PriceShiftStillEconomical	4.6514	.48165	1268
PricePerPillEconomical	4.6506	.50587	1268

MultipleBottlePricePurchase dEconomical	4.6199	.54097	1268
QualityWorthPurchasePrice	4.6388	.51079	1268



**Correlations**

	Satisfacto ryPriceEff ectivenes s	Continuo usSatisfa ctoryPrici ng	BottlePrice Economica lYearRoun d	PriceSh iftStillEc onomic al	PriceP erPillE conomi cal	MultipleBottle PricePurchas edEconomica l	QualityW orthPurc hasePric e
SatisfactoryPr iceEffectivene ss	1	.706**	.720**	.722**	.703**	.647**	.725**
Corre lati on Sig. (1- tail ed)		.000	.000	.000	.000	.000	.000
Su m of Sq ua res an d Cr os s- pr od uct s	282.827	209.493	206.868	208.277	212.82 9	209.634	221.600

	Co var ian ce N	.223 1268	.165 1268	.163 1268	.164 1268	.168 1268	.165 1268	.175 1268
ContinuousSa Pe tisfactoryPrici ars ng on Co rre lati on Si g. (1- tail ed) Su m of Sq ua res an d Cr os s- pr od uct s Co var ian ce N		.706** .000 209.493 .165 1268	1 311.163 246 1268	.885** .000 266.594 .210 1268	.863** .000 261.093 .206 1268	.884** .000 280.73 6 222 1268	.703** .000 238.803 .188 1268	.846** .000 271.377 .214 1268



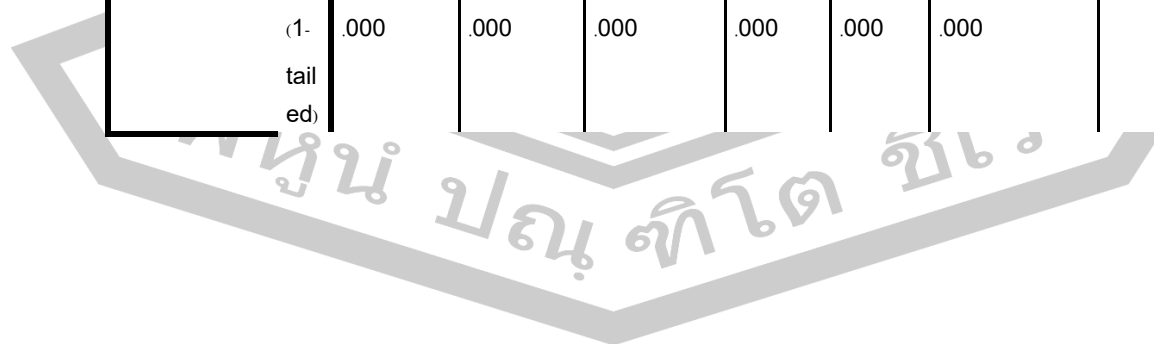
BottlePriceEc onomicalYear Round	Pe ars on Co rre lati on Si g. (1- tail ed) Su m of Sq ua res an d Cr os s- pr od uct s Co var ian ce N	.720**	.885**	1	.862**	.884**	.756**	.859**
		.000	.000		.000	.000	.000	.000
		206.868	266.594	291.769	252.368	272.024	248.645	266.879
		.163	.210	.230	.199	.215	.196	.211
		1268	1268	1268	1268	1268	1268	1268
PriceShiftStill Economical	Pe ars on Co rre lati on	.722**	.863**	.862**	1	.883**	.751**	.890**

	Si g. (1- tail ed)	.000	.000	.000		.000	.000	.000
	Su m of Sq ua res an d	208.277	261.093	252.368	293.927	272.57 9	247.984	277.350
	Cr os s- pr od uct s Co var ian ce	.164	.206	.199	.232	.215	.196	.219
	N	1268	1268	1268	1268	1268	1268	1268
PricePerPillE conomical	Pe ars on Co rre lati on Si g. (1- tail ed)	.703**	.884**	.884**	.883**	1	.804**	.925**
	Si g. (1- tail ed)	.000	.000	.000	.000		.000	.000

Sum of Squares and Cross-products Covariance	212.829	280.736	272.024	272.579	324.229	278.604	302.989
N	1268	1268	1268	1268	1268	1268	1268
Multiple Bottles Price Purchased Economical	.647**	.703**	.756**	.751**	.804**	.1	.814**
Correlation							
Significance (1-tailed)	.000	.000	.000	.000	.000		.000

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Sum of Squares and Cross-products Covariance	209.634	238.803	248.645	247.984	278.604	370.779	284.902
N	1268	1268	1268	1268	1268	1268	1268
QualityWorth PurchasePrice	.725**	.846**	.859**	.890**	.925**	.814**	1
Person Correlation							
Sign. (1-tailed)	.000	.000	.000	.000	.000	.000	



Sum of Squares and Cross-products Covariance	221.600	271.377	266.879	277.350	302.989	284.902	330.571
Correlation	.175	.214	.211	.219	.239	.225	.261
N	1268	1268	1268	1268	1268	1268	1268

\*\* Correlation is significant at the 0.01 level (1-tailed).

## ADHERENCE-KNOWLEDGE

### Descriptive Statistics

	Mean	Std. Deviation	N
HealthCareProvideEnoughKnowledge	1.6343	.47573	1268
IncreaseSeverityIncreaseAdherence	4.6404	.50414	1268
HealthConditionRemindPurchase	4.6396	.51212	1268
HealthCareProvideEnoughIndicationUse	4.6412	.49602	1268
HealthCareProvideUsageKnowledge	4.6388	.51079	1268











HealthCo P nditionR emindPu a rchase r s o n C o rr el a ti o n S ig . (1 - t ai le d)	.671"	.821"	1	.879"	.923"	.821"	.885"	.892"	.795"
	.000	.000		.000	.000	.000	.000	.000	.000



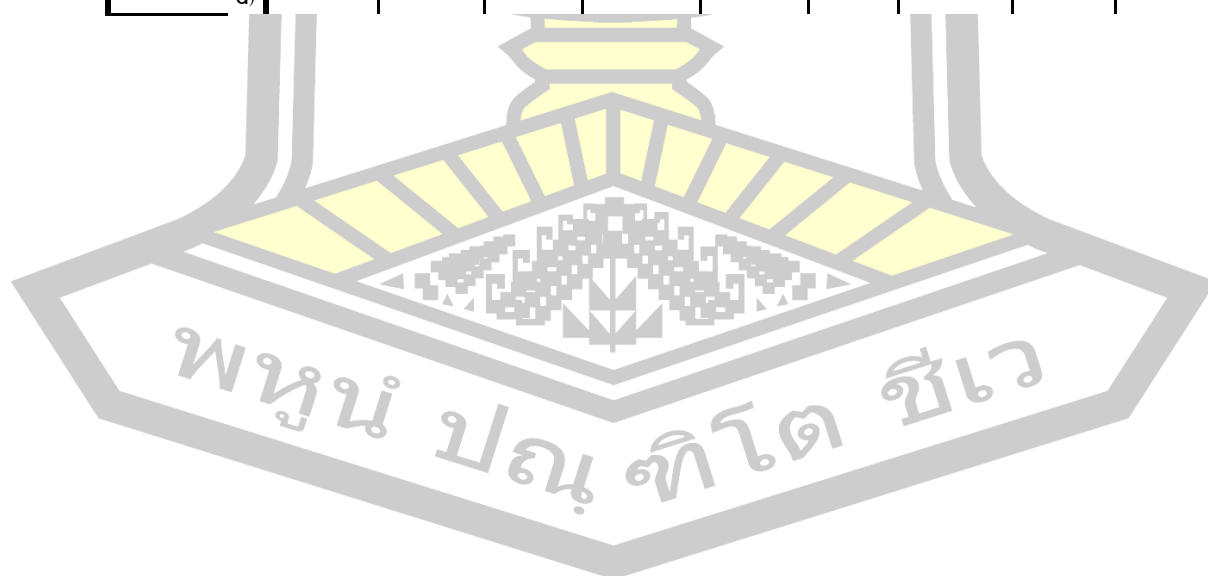


HealthCa P reProvid e eEnough a Indicatio r nUse s o n C .678** o .749** rr .879** el 1 a .846** ti .749** o .994** n .880** S ig . (1 - .000 t .000 ai .000 le .000 d) .000									
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HealthCare Providers Usage Knowledge	P									
	e									
	a									
	r									
	s									
	o									
	n									
	C	.694**	.841**	.923**	.846**	1	.841**	.852**	.867**	.814**
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LongTerm Knowledge Provided	P							
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	n							
	C	.636"	1.000"	.821"	.749"	.841"	1	.755"
	o							.754"
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MoreAdh P erenceAf e terLongT a ermClarif r ied s o n C .672" .755" .885" .994" .852" .755" 1 .886" .700" o rr el a ti o n S ig . (1 - t ai le d)									
	.000	.000	.000	.000	.000	.000		.000	.000





Improve mentHel psMoreA dherence	P e a r s o n C o rr el a ti o n S ig . (1 - t ai le d)	.685"	.754"	.892"	.880"	.867"	.754"	.886"	1	.754"
		.000	.000	.000	.000	.000	.000	.000		.000







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C	.631"	.754"	.795"	.694"	.814"	.754"	.700"	.754"	1
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a	205.667	260.382	279.003	235.760	284.625	260.382	237.274	247.710	370.297
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ri	.162	.206	.220	.186	.225	.206	.187	.196	.292
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N	1268	1268	1268	1268	1268	1268	1268	1268	1268

\*\* Correlation is significant at the 0.01 level (1-tailed).

## ADHERENCE-PROMOTION CORRELATION

### Descriptive Statistics

	Mean	Std. Deviation	N
PromotePriceAdhereLongTerm	1.6174	.47999	1268
PriceAdhereLongTerm	4.6285	.52261	1268
QualityPriceAdhereLongTerm	4.6388	.51233	1268
FeelingsReachMadePurchased	4.6412	.49602	1268
PromotionMakesFrequentVisitAtRetail	4.6530	.47951	1268
RepurchaseFrequentlyBeforePromotionEnds	4.6293	.50708	1268
FrequentPromotionFrequentPurchases	4.6443	.49511	1268
PromotionAffectContinuePurchaseForLongTerm	4.6215	.54061	1268

### Correlations

	PromotePriceAdhereLongTerm	PriceAdhereLongTerm	QualityPriceAdhereLongTerm	FeelingsReachMadePurchased	PromotionMakesFrequentVisitAtRetail	RepurchaseFrequentlyBeforePromotionEnds	FrequentPromotionFrequentPurchases	PromotionAffectContinuePurchaseForLongTerm
PromotePriceAdhereLongTerm	1.000							
PriceAdhereLongTerm		1.000						
QualityPriceAdhereLongTerm			1.000					
FeelingsReachMadePurchased				1.000				
PromotionMakesFrequentVisitAtRetail					1.000			
RepurchaseFrequentlyBeforePromotionEnds						1.000		
FrequentPromotionFrequentPurchases							1.000	
PromotionAffectContinuePurchaseForLongTerm								1.000

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PromotePric eAdhereLon gTerm	P e ar s o n C or re la ti o n Si g. (1 - ta il e d)	1	.661"	.641"	.666"	.673"	.626"	.661"	.613"
			.000	.000	.000	.000	.000	.000	.000



S u m o f S q u a r e s a n d C r o s s- p r o d u c t s C o v a r i a n c e N	291.90 8	210. 022	199.84 6	200.99 4	196.284	193.105	198.975	201.528
	.230	.166	.158	.159	.155	.152	.157	.159
	1268	1268	1268	1268	1268	1268	1268	1268



PriceAdhere LongTerm	P e a r s o n C o r r e l a t i o n S i g. ( t a i l e d)								
		.661"	1	.881"	.813"	.840"	.814"	.819"	.804"
		.000		.000	.000	.000	.000	.000	.000



S u m o f S q u a r e s a n d C r o s s- p r o d u c t s C o v a r i a n c e N	210.02 2	346. 047	298.87 5	266.99 0	266.562	273.418	268.476	287.703
	.166	.273	.236	.211	.210	.216	.212	.227
	1268	1268	1268	1268	1268	1268	1268	1268

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Quality Adhere Term	Price Long	P e ar s o n C or re la ti o n Si g. (1 - ta il e d)						
	.641"	.881"	1	.884"	.884"	.803"	.890"	.794"
	.000	.000		.000	.000	.000	.000	.000



S u m o f S q u a r e s a n d C r o s s- p r o d u c t s C o v a r i a n c e N	199.84 6	298. 875	332.57 1	284.65 5	275.073	264.237	286.099	278.625
	.158	.236	.262	.225	.217	.209	.226	.220
	1268	1268	1268	1268	1268	1268	1268	1268

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FeelingsRe achMadePu rchased	P e ar s o n C or re la ti o n Si g. (1 - ta il e d)	.666**	.813**	.884**	1	.880**	.739**	.994**	.694**
		.000	.000	.000		.000	.000	.000	.000



S u m o f S q u a r e s a n d C r o s s- p r o d u c t s C o v a r i a n c e N	200.99 4	266. 990	284.65 5	311.73 1	265.114	235.349	309.166	235.760
	.159	.211	.225	.246	.209	.186	.244	.186
	1268	1268	1268	1268	1268	1268	1268	1268

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PromotionM akesFreque ntVisitAtRet ail	P e ar s o n C or re la ti o n Si g. (1 - ta il e d)	.673"	.840"	.884"	.880"	1	.733"	.886"	.747"
		.000	.000	.000	.000		.000	.000	.000



S u m o f S q u a r e s a n d C r o s s- p r o d u c t s C o v a r i a n c e N	196.28 4	266. 562	275.07 3	265.11 4	291.319	225.909	266.502	245.438
	.155	.210	.217	.209	.230	.178	.210	.194
	1268	1268	1268	1268	1268	1268	1268	1268



Repurchase Frequently before Promot ion Ends	P e ar s o n C or re la ti o n Si g. (1 - ta il e d)								
		.626"	.814"	.803"	.739"	.733"	1	.745"	.743"
		.000	.000	.000	.000	.000		.000	.000





S u m o f S q u a r e s a n d C r o s s- p r o d u c t s C o v a r i a n c e N	193.10 5	273. 418	264.23 7	235.34 9	225.909	325.789	236.831	258.082
	.152	.216	.209	.186	.178	.257	.187	.204
	1268	1268	1268	1268	1268	1268	1268	1268

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FrequentPro motionFreq uentPurcha ses	P e ar s o n C or re la ti o n Si g. (1 - ta il e d)	.661**	.819**	.890**	.994**	.886**	.745**	1	.700**
		.000	.000	.000	.000	.000	.000		.000



S u m o f S q u a r e s a n d C r o s s- p r o d u c t s C o v a r i a n c e N	198.97 5	268. 476	286.09 9	309.16 6	266.502	236.831	310.589	237.274
	.157	.212	.226	.244	.210	.187	.245	.187
	1268	1268	1268	1268	1268	1268	1268	1268

ศูนย์ ประถมศึกษา

PromotionAffectContinu ePurchaseForLongTerm	P e ar s o n C or re la ti o n Si g. (1 - ta il e d)	.613**	.804**	.794**	.694**	.747**	.743**	.700**	1
		.000	.000	.000	.000	.000	.000	.000	



S u m o f S q u a r e s a 	201.528	287.703	278.625	235.760	245.438	258.082	237.274	370.297
	.159	.227	.220	.186	.194	.204	.187	.292
	1268	1268	1268	1268	1268	1268	1268	1268

\*\* Correlation is significant at the 0.01 level (1-tailed).

### ADHERENCE-EDUCATION CORRELATION

**Descriptive Statistics**

	Mean	Std. Deviation	N
--	------	----------------	---

ProductEducationMeetExpectation	1.6553	.47143	1268
HealthcareProvideAnswerForAdherence	4.6136	.54233	1268
ItemizedDiscussionImproveAdherence	4.6593	.49049	1268
FurtherSelfEducatedImproveAdherence	4.6388	.51079	1268
EducationLanguageWereNoBarrier	4.6420	.50369	1268
ReCounselingIsNotNeedForUse	4.6443	.49511	1268
FeltMorePositiveForUseAfterEducated	4.6577	.47962	1268
InformationEasilyUnderstood	4.6625	.50219	1268

**Correlations**

	Product Education Meet Expectation	Healthcare Provide Answer For Adherence	Itemized Discussion Improve Adherence	Further Self Educated Improve Adherence	Education Language Were No Barrier	ReCounseling Is Not Need For Use	Felt More Positive For Use After Educated	Information Easily Understood
Product Education Meet Expectation	1	.661**	.672**	.729**	.664**	.708**	.720**	.697**





Healthcar eProvideA nswerFor Adherenc e	P e ar s o n C or re la ti o n Si g. (1 - ta il e d)	.661**	1	.692**	.826**	.762**	.719**	.775**	.819**
		.000		.000	.000	.000	.000	.000	.000



S u m o f S q u a r e s a n d C r o s s- p r o d u c t s C o v a r i a n c e N	214.239	372.647	233.060	290.013	263.558	244.718	255.287	282.606
	.169	.294	.184	.229	.208	.193	.201	.223
	1268	1268	1268	1268	1268	1268	1268	1268

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S u m o f S q u a r e s a n d C r o s s- p r o d u c t s C o v a r i a n c e N	196.933	233.060	304.820	261.962	235.325	297.347	254.139	258.18 3
	.155	.184	.241	.207	.186	.235	.201	.204
	1268	1268	1268	1268	1268	1268	1268	1268

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FurtherSel P fEducated e ImproveA ar dherence s o n C .729** or re la ti o n Si g. (1 - ta il e d)	.826**	.825**	1	.844**	.852**	.867**	.918**
	.000	.000		.000	.000	.000	.000



S u m o f S q u a r e s a n d C r o s s- p r o d u c t s C o v a r i a n c e N	222.520	290.013	261.962	330.571	275.016	273.099	269.240	298.40 7
	.176	.229	.207	.261	.217	.216	.213	.236
	1268	1268	1268	1268	1268	1268	1268	1268

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Education P Language e WereNoB ar arrier s o n C or re la ti o n Si g. (1 - ta il e d)	.664**	.762**	.752**	.844**	1	.758**	.757**	.814**
	.000	.000	.000	.000		.000	.000	.000





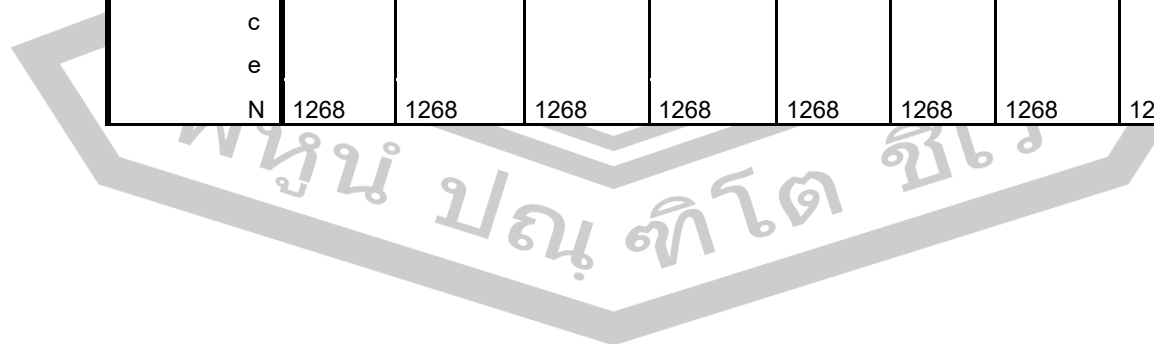
S u m o f S q u a r e s a n d C r o s s- p r o d u c t s C o v a r i a n c e N	199.749	263.558	235.325	275.016	321.448	239.522	231.609	260.757
	.158	.208	.186	.217	.254	.189	.183	.206
	1268	1268	1268	1268	1268	1268	1268	1268

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ReCouns elingsNot NeedForU se	P e ar s o n C or re la ti o n Si g. (1 - ta il e d)	.708"	.719"	.966"	.852"	.758"	1	.886"	.860"
		.000	.000	.000	.000	.000		.000	.000



S u m o f S q u a r e s a n d C r o s s- p r o d u c t s C o v a r i a n c e N	209.383	244.718	297.347	273.099	239.522	310.589	266.636	270.77 0
	.165	.193	.235	.216	.189	.245	.210	.214
	1268	1268	1268	1268	1268	1268	1268	1268



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S u m o f S q u a r e s a n d C r o s s- p r o d u c t s C o v a r i a n c e N	206.343	255.287	254.139	269.240	231.609	266.636	291.454	275.508
	.163	.201	.201	.213	.183	.210	.230	.217
	1268	1268	1268	1268	1268	1268	1268	1268

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S u m o f S q u a r e s a n d C r o s s- p r o d u c t s C o v a r i a n c e N	209.012	282.606	258.183	298.407	260.757	270.770	275.508	319.533
	.165	.223	.204	.236	.206	.214	.217	.252
	1268	1268	1268	1268	1268	1268	1268	1268

\*\* Correlation is significant at the 0.01 level (1-tailed).

### ADHERENCE-BENEFITS CORRELATION

Descriptive Statistics



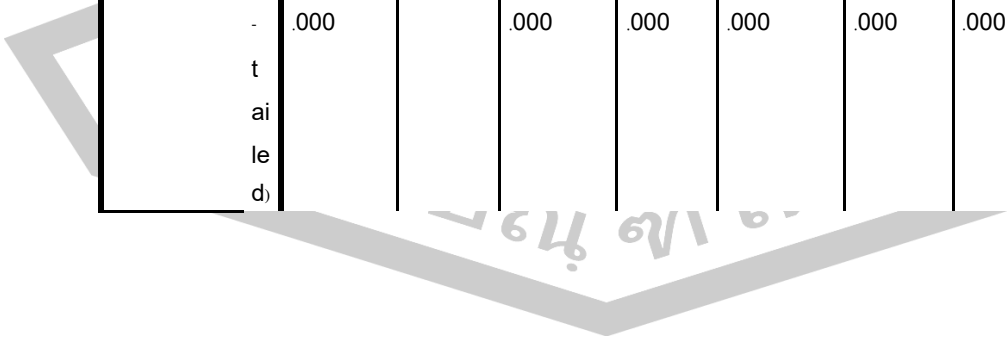
	Mean	Std. Deviation	N
FeelSafeLongTermFromStandardization	1.6406	.47770	1268
EverdayEfficacyImproveAdherence	4.6380	.51409	1268
PerceiveBenefitEncourageLongTermUse	4.6514	.51491	1268
MoreAdhereFromBenefitEducation	4.6625	.50219	1268
LongTermAdherenceFromEducationBenefits	4.6743	.46882	1268
EverydayUseMakesAdhereLongTerm	4.6625	.47472	1268
LongTermSafetyCombinationWithDrugs	4.6388	.50924	1268
MoreAdhereWhenUnderstoodManufactureBenefit	4.6932	.46644	1268

**Correlations**

	FeelSafeLongTermFromStandardization	EverdayEfficacyImproveAdherence	PerceiveBenefitEncourageLongTermUse	MoreAdhereFromBenefitEducation	LongTermAdherenceFromEducationBenefits	EverydayUseMakesAdhereLongTerm	LongTermSafetyCombinationWithDrugs	MoreAdhereWhenUnderstoodManufactureBenefit
FeelSafeLongTermFromStandardization	1	.796**	.766**	.760**	.810**	.799**	.805**	.784**

S ig - (1 - t ai le d) S u m o f S q u a r e s a n d C r o s s- p r o d u c t s								
	.000	.000	.000	.000	.000	.000	.000	
	289.123	247.74 2	238.702	230.93 3	229.724	229.483	248.152	221.349

Covariance	.228	.196	.188	.182	.181	.181	.196	.175
N	1268	1268	1268	1268	1268	1268	1268	1268
EverdayEffi cacyImprov eAdherenc e	.796**	1	.892**	.868**	.853**	.860**	.911**	.820**
Correlati on Signi ficance (1-tailed)	.000		.000	.000	.000	.000	.000	.000









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	C	.760"	.868"	.814"	1	.880"	.846"	.955"	.835"
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LongTerm Adherence FromEduc ationBenefi ts	P e a r s o n C o r r e l a t i o n S ig n i f ic a n c e p - v a l u e	.810**	.853**	.817**	.880**	1	.896**	.875**	.889**
	(1-tailed)	.000	.000	.000	.000		.000	.000	.000





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C	.799"	.860"	.813"	.846"	.896"	1	.886"
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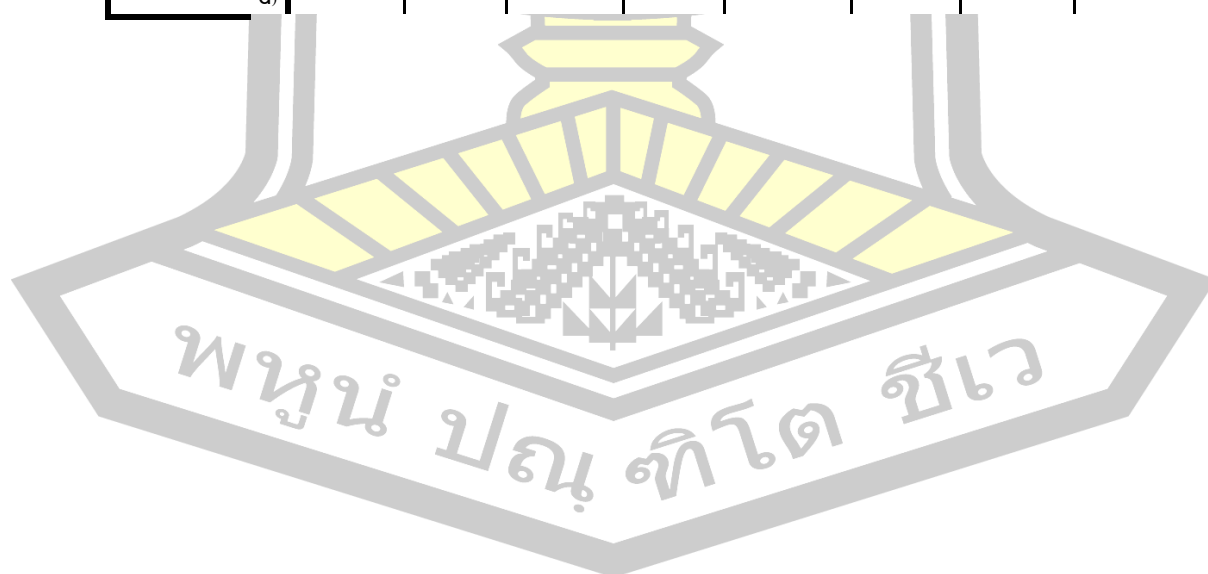
LongTerm SafetyCom binationWit hDrugs	P e a r s o n C o r r e l a t i o n S ig n i f i c a n c e	.805**	.911**	.859**	.955**	.875**	.886**	1	.836**
(1 - t ai le d)		.000	.000	.000	.000	.000	.000		.000







MoreAdher P eWhenUnd e erstoodMa a nufactureB r enefit s o n C .784" .820" .783" .835" .889" .837" .836" 1 o rr el a ti o n S ig . (1 - .000 .000 .000 .000 .000 .000 .000 t ai le d)
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a	.175	.197	.188	.195	.194	.185	.198	.218
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N	1268	1268	1268	1268	1268	1268	1268	1268

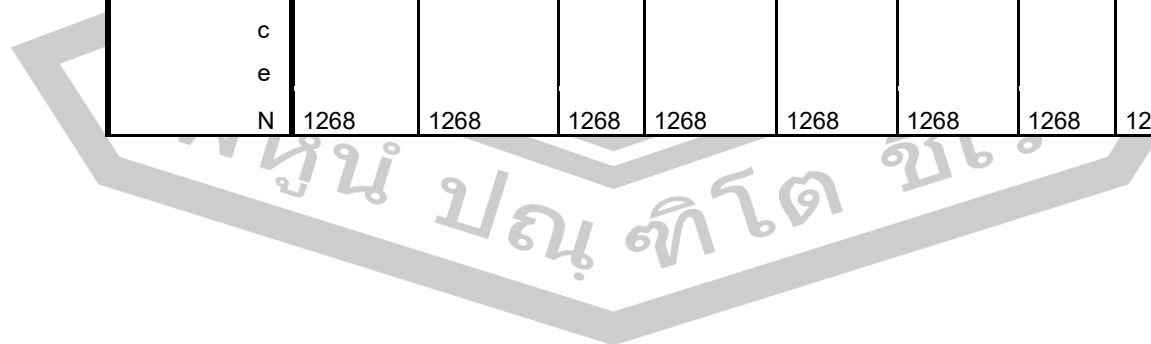
\*\* Correlation is significant at the 0.01 level (1-tailed).



HaveProblemWithAdherenceRegularly	Pearson's Correlation	1							
	Significance (1-tailed)		.699**	.702**	.714**	.712**	.718**	.725**	.660**
			.000	.000	.000	.000	.000	.000	.000



S u m o f S q u a r e s a n d C r o s s- p r o d u c t s C o v a r i a n c e N	282.253	206.719	207.4 16	216.769	206.900	205.377	221.48 5	198.72 7
	.223	.163	.164	.171	.163	.162	.175	.157
	1268	1268	1268	1268	1268	1268	1268	1268



MoreEnergy P eticWhenU e seTechnol ar ogyDevice s	699"	1	.994"	.897"	.869"	.881"	.854"	.760"
o n C or re la ti o n Si g. (1 - ta il e d)	.000		.000	.000	.000	.000	.000	.000



S u m o f S q u a r e s a n d C r o s s- p r o d u c t s C o v a r i a n c e N	206.719	310.300	308.0 09	285.300	264.849	264.107	273.46 1	239.88 0
	.163	.245	.243	.225	.209	.208	.216	.189
	1268	1268	1268	1268	1268	1268	1268	1268

ศูนย์ ประถมศึกษา



SystemIsM oreConven ient	P e ar s o n C or re la ti o n Si g. (1 - ta il e d)	.702"	.994"	1	.890"	.862"	.874"	.848"	.753"
		.000	.000		.000	.000	.000	.000	.000



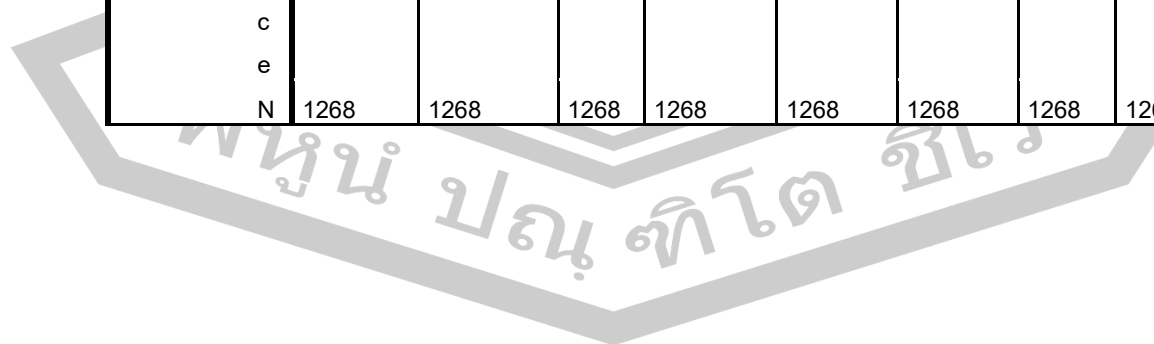
S u m o f S q u a r e s a n d C r o s s- p r o d u c t s C o v a r i a n c e N	207.416	308.009	309.7 16	283.009	262.543	261.782	271.18 3	237.59 6
	.164	.243	.244	.223	.207	.207	.214	.188
	1268	1268	1268	1268	1268	1268	1268	1268

ศูนย์ ประถมศึกษา

Technology Accessibility eHelp Forgiveness	P e ar s o n C or re la ti o n Si g. (1 - ta il e d)	.714"	.897"	.890"	1	.905"	.921"	.939"	.830"
		.000	.000	.000		.000	.000	.000	.000



S u m o f S q u a r e s a n d C r o s s- p r o d u c t s C o v a r i a n c e N	216.769	285.300	283.0 09	326.300	282.849	283.107	308.46 1	268.88 0
	.171	.225	.223	.258	.223	.223	.243	.212
	1268	1268	1268	1268	1268	1268	1268	1268



WebssystemHelpAdherenceRegularly	P e a r s o n C o r r e l a t i o n S i g n i f i c a n t e d	.712**	.869**	.862**	.905**	1	.943**	.849**	.740**
		.000	.000	.000	.000		.000	.000	.000



S u m o f S q u a r e s a n d C r o s s- p r o d u c t s C o v a r i a n c e N	206.900	264.849	262.5 43	282.849	299.319	277.483	267.07 3	229.46 1
	.163	.209	.207	.223	.236	.219	.211	.181
	1268	1268	1268	1268	1268	1268	1268	1268

พหุคูณ ประถมศึกษา

FeelMoreC onfidentInS upplement Use	P e ar s o n C or re la ti o n Si g. (1 - ta il e d)	.718**	.881**	.874**	.921**	.943**	1	.864**	.756**
		.000	.000	.000	.000	.000		.000	.000



S u m o f S q u a r e s a n d C r o s s- p r o d u c t s C o v a r i a n c e N	205.377	264.107	261.7 82	283.107	277.483	289.533	267.40 7	230.75 7
	.162	.208	.207	.223	.219	.229	.211	.182
	1268	1268	1268	1268	1268	1268	1268	1268

พหุคูณ ประถมศึกษา



MoreRobu stInTrackEf ficiency	P e a r s o n C o r r e l a t i o n S i g. (1 - t a i l e d)	.725"	.854"	.848"	.939"	.849"	.864"	1	.844"
		.000	.000	.000	.000	.000	.000		.000



S u m o f S q u a r e s a n d C r o s s- p r o d u c t s C o v a r i a n c e N	221.485	273.461	271.1 83	308.461	267.073	267.407	330.57 1	275.01 6
	.175	.216	.214	.243	.211	.211	.261	.217
	1268	1268	1268	1268	1268	1268	1268	1268

พหุคูณ ประถมศึกษา

WebTrackingSolveAdherence	Percentage							
		660"	760"	753"	830"	740"	756"	844"
		.000	.000	.000	.000	.000	.000	.000
								1



S u m o f S q u a r e s a n d C r o s s- p r o d u c t s C o v a r i a n c e N	198.727	239.880	237.5 96	268.880	229.461	230.757	275.01 6	321.44 8
	.157	.189	.188	.212	.181	.182	.217	.254
	1268	1268	1268	1268	1268	1268	1268	1268

\*\* Correlation is significant at the 0.01 level (1-tailed).

มหาวิทยาลัยเทคโนโลยี

## MULTIPLE CORRELATION OF HYPOTHESIS GROUP 1

### Descriptive Statistics

	Mean	Std. Deviation	N
ContinuablePrice	1.6567	.47286	1180
BottlePrice	4.6492	.50338	1180
EconomicPrice	4.6517	.47664	1180
PillCostEffective	4.6364	.51197	1180
SupplementEffective	4.6407	.49394	1180
PriceFitsLifeStyle	4.6593	.47592	1180

### Correlations

		ContinuablePrice	BottlePrice	EconomicPrice	PillCostEffective	SupplementEffective	PriceFitsLifeStyle
ContinuablePrice	Pearson Correlation Sig. (1-tailed)	1	.723**	.802**	.796**	.787**	.784**
	Sum of Squares and Cross-products	263.620	202.904	213.034	227.304	216.721	208.124
	Covariance	.224	.172	.181	.193	.184	.177
	N	1180	1180	1180	1180	1180	1180
BottlePrice	Pearson Correlation Sig. (1-tailed)	.723**	1	.819**	.867**	.792**	.779**
		.000		.000	.000	.000	.000



SupplementEffective	Pearson Correlation	.787**	.792**	.916**	.888**	1	.926**
	Sig. (1-tailed)	.000	.000	.000	.000		.000
	Sum of Squares and Cross-products	216.721	232.241	254.319	264.851	287.647	256.553
	Covariance	.184	.197	.216	.225	.244	.218
	N	1180	1180	1180	1180	1180	1180
PriceFitsLifestyle	Pearson Correlation	.784**	.779**	.897**	.887**	.926**	1
	Sig. (1-tailed)	.000	.000	.000	.000	.000	
	Sum of Squares and Cross-products	208.124	219.959	239.981	254.849	256.553	267.047
	Covariance	.177	.187	.204	.216	.218	.227
	N	1180	1180	1180	1180	1180	1180

\*\* Correlation is significant at the 0.01 level (1-tailed).

#### Descriptive Statistics

	Mean	Std. Deviation	N
SaleEfficiency	1.6424	.47591	1180
PriceFeelingReach	4.6415	.50558	1180
ContinualUseDecision	4.6466	.48352	1180
RepurchaseRegardlessPrice	4.5644	.56179	1180

## Correlations

		SaleEfficiency	PriceFeelingReach	ContinualUseDecision	RepurchaseRegardlessPrice
SaleEfficiency	Pearson Correlation	1	.653**	.723**	.592**
	Sig. (1-tailed)		.000	.000	.000
	Sum of Squares and Cross-products	267.031	185.124	196.219	186.530
	Covariance	.226	.157	.166	.158
	N	1180	1180	1180	1180
PriceFeelingReach	Pearson Correlation	.653**	1	.793**	.629**
	Sig. (1-tailed)	.000		.000	.000
	Sum of Squares and Cross-products	185.124	301.365	228.516	210.744
	Covariance	.157	.256	.194	.179
	N	1180	1180	1180	1180
ContinualUseDecision	Pearson Correlation	.723**	.793**	1	.757**
	Sig. (1-tailed)	.000	.000		.000



	Sum of Squares and Cross-products Covariance	196.219	228.516	275.636	242.358
	N	1180	1180	1180	1180
RepurchaseRegardlessPrice	Pearson Correlation	.592**	.629**	.757**	1
	Sig. (1-tailed)	.000	.000	.000	
	Sum of Squares and Cross-products Covariance	186.530	210.744	242.358	372.105
	N	1180	1180	1180	1180

\*\* Correlation is significant at the 0.01 level (1-tailed).

#### Descriptive Statistics

	Mean	Std. Deviation	N
AdhereLongTerm	1.6575	.47258	1180
FrequentStoreVisit	4.6347	.51407	1180
AtVisitRepurchase	4.6322	.51638	1180
ContinuePurchase	4.6356	.49877	1180
MultiplePurchase	4.6551	.48086	1180

#### Correlations

	AdhereLongTerm	FrequentStoreVisit	AtVisitRepurchase	ContinuePurchase	MultiplePurchase

AdhereLongTerm	Pearson Correlation	1	.779**	.782**	.763**	.768**
	Sig. (1-tailed)		.000	.000	.000	.000
	Sum of Squares and Cross-products	263.306	222.983	224.955	212.025	205.752
	Covariance	.223	.189	.191	.180	.175
	N	1180	1180	1180	1180	1180
FrequentStoreVisit	Pearson Correlation	.779**	1	.970**	.857**	.859**
	Sig. (1-tailed)	.000		.000	.000	.000
	Sum of Squares and Cross-products	222.983	311.575	303.480	258.941	250.342
	Covariance	.189	.264	.257	.220	.212
	N	1180	1180	1180	1180	1180
AtVisitPurchase	Pearson Correlation	.782**	.970**	1	.866**	.865**
	Sig. (1-tailed)	.000	.000		.000	.000
	Sum of Squares and Cross-products	224.955	303.480	314.376	262.847	253.307

	Covariance	.191	.257	.267	.223	.215
	N	1180	1180	1180	1180	1180
ContinuePurchase	Pearson Correlation	.763**	.857**	.866**	1	.894**
	Sig. (1-tailed)	.000	.000	.000		.000
	Sum of Squares and Cross-products	212.025	258.941	262.847	293.305	252.686
	Covariance	.180	.220	.223	.249	.214
	N	1180	1180	1180	1180	1180
MultiplePurchase	Pearson Correlation	.768**	.859**	.865**	.894**	1
	Sig. (1-tailed)	.000	.000	.000	.000	
	Sum of Squares and Cross-products	205.752	250.342	253.307	252.686	272.619
	Covariance	.175	.212	.215	.214	.231
	N	1180	1180	1180	1180	1180

\*\* Correlation is significant at the 0.01 level (1-tailed).

#### Descriptive Statistics

	Mean	Std. Deviation	N
SatisfactoryAfterEducate	1.6606	.47120	1180
AdhereToCounsel	4.6441	.47900	1180
SatisfactoryLanguage	4.6280	.51580	1180

UnderstoodCare	4.6347	.49559	1180
AnswerSatisfactory	4.6517	.47841	1180

### Correlations

		SatisfactoryAfter Educate	AdhereToC ounsel	SatisfactoryLa nguage	Understoo dCare	AnswerSatis factory
SatisfactoryAfter Educate	Pearson Correlation Sig. (1- tailed) Sum of Square s and Cross- produc ts Covari ance N	1    261.768   1180	.769**   204.599  1180	.763**   218.600  1180	.759**   208.866  1180	.758**   201.504  1180
AdhereToCouns el	Pearson Correlation Sig. (1- tailed) Sum of Square s and Cross- produc ts Covari ance N	.769**   204.599  1180	1   270.508  1180	.933**   271.746  1180	.924**   258.593  1180	.909**   245.712  1180

SatisfactoryLanguage	Pearson Correlation	.763**	.933**	1	.898**	.897**
	Sig. (1-tailed)	.000	.000		.000	.000
	Sum of Squares and Cross-products	218.600	271.746	313.677	270.653	261.094
	Covariance	.185	.230	.266	.230	.221
	N	1180	1180	1180	1180	1180
UnderstoodCare	Pearson Correlation	.759**	.924**	.898**	1	.930**
	Sig. (1-tailed)	.000	.000	.000		.000
	Sum of Squares and Cross-products	208.866	258.593	270.653	289.575	259.881
	Covariance	.177	.219	.230	.246	.220
	N	1180	1180	1180	1180	1180
AnswerSatisfactory	Pearson Correlation	.758**	.909**	.897**	.930**	1
	Sig. (1-tailed)	.000	.000	.000	.000	

Sum of Squares and Cross-products	201.504	245.712	261.094	259.881	269.847
Covariance	.171	.208	.221	.220	.229
N	1180	1180	1180	1180	1180

\*\* Correlation is significant at the 0.01 level (1-tailed).

#### Descriptive Statistics

	Mean	Std. Deviation	N
AdhereLongTerm	1.6606	.47120	1180
QualityPriceAdhere	4.6441	.47900	1180
PurchaseFromGoodPromotion	4.6280	.51580	1180
PriceAffectDecision	4.6347	.49559	1180
MultipleVisitFromPromotion	4.6517	.47841	1180

#### Correlations

	AdhereLongTerm	QualityPriceAdhere	PurchaseFromGoodPromotion	PriceAffectDecision	MultipleVisitFromPromotion
AdhereLongTerm	1	.769**	.763**	.759**	.758**
Pearson Correlation					
Sig. (1-tailed)		.000	.000	.000	.000

	Sum of Squar es and Cross - produ cts Covar iance N	261.768 .222 1180	204.599 .174 1180	218.600 .185 1180	208.866 .177 1180	201.504 .171 1180
QualityPriceAdhe re	Pears on Correl ation Sig. (1- tailed) Sum of Squar es and Cross - produ cts Covar iance N	.769** .000 204.599 .174 1180	1 .000 270.508 .229 1180	.933** .000 271.746 .230 1180	.924** .000 258.593 .219 1180	.909** .000 245.712 .208 1180
PurchaseFromGo odPromotion	Pears on Correl ation Sig. (1- tailed)	.763** .000	.933** .000	1	.898** .000	.897** .000

	Sum of Squares and Cross-products Covariance	.185	.230	.266	.230	.221
	N	1180	1180	1180	1180	1180
PriceAffectDecision	Pearson Correlation Sig. (1-tailed)	.759**	.924**	.898**	.1	.930**
	Sum of Squares and Cross-products Covariance	.000	.000	.000		.000
	Sum of Squares and Cross-products Covariance	208.866	258.593	270.653	289.575	259.881
	N	1180	1180	1180	1180	1180
MultipleVisitFromPromotion	Pearson Correlation Sig. (1-tailed)	.758**	.909**	.897**	.930**	.1
	Sum of Squares and Cross-products Covariance	.000	.000	.000	.000	



Sum of Squares and Cross-products Covariance	201.504	245.712	261.094	259.881	269.847
N	1180	1180	1180	1180	1180

\*\* Correlation is significant at the 0.01 level (1-tailed).

**Descriptive Statistics**

	Mean	Std. Deviation	N
LongTermUseAdhere	1.6626	.47085	1180
PerceiveKnowledgeEncourage	4.6364	.49513	1180
MoreAdhereKnowProduction	4.6492	.47921	1180
UnderstandBenefits	4.6390	.50796	1180
KnownStandardizedQuality	4.6297	.51538	1180

**Correlations**

	LongTerm UseAdhere	PerceiveKnowle dgeEncourage	MoreAdhereKn owProduction	Understan dBenefits	KnownStanda rdizedQuality
LongTermUseA dhere	1	.755**	.761**	.693**	.759**
Pearson Correlation Sig. (1-tailed)		.000	.000	.000	.000

	Sum of Squa res and Cros s- produ cts Cova rianc e N	261.386 .222 1180	207.549 .176 1180	202.460 .172 1180	195.311 .166 1180	217.150 .184 1180
PerceiveKnowle dgeEncourage	Pear son Corre lation Sig. (1- tailed ) Sum of Squa res and Cros s- produ cts Cova rianc e N	.755** .000 207.549 .176 1180	1 289.033 .245 1180	.931** .000 260.486 .221 1180	.803** .000 238.124 .202 1180	.895** .000 269.125 .228 1180
MoreAdhereKno wProduction	Pear son Corre lation	.761**	.931**	1	.789**	.892**

	Sig. (1- tailed )	.000	.000		.000	.000
	Sum of Squa res and Cros s- produ cts Cova rianc e N	202.460	260.486	270.749	226.539	259.680
		.172	.221	.230	.192	.220
		1180	1180	1180	1180	1180
UnderstandBen efits	Pear son Corre lation Sig. (1- tailed )	.693**	.803**	.789**	1	.869**
	Sum of Squa res and Cros s- produ cts Cova rianc e N	195.311	238.124	226.539	304.207	268.236
		.166	.202	.192	.258	.228
		1180	1180	1180	1180	1180

KnownStandardizedQuality	Pearson Correlation Sig. (1-tailed)	.759**	.895**	.892**	.869**	1
	Sum of Squares and Cross-products Covariance	.000	.000	.000	.000	
		217.150	269.125	259.680	268.236	313.162
		.184	.228	.220	.228	.266
	N	1180	1180	1180	1180	1180

\*\* Correlation is significant at the 0.01 level (1-tailed).

#### Descriptive Statistics

	Mean	Std. Deviation	N
RefillAbilityForAdherence	1.6606	.47120	1180
SupplyChainInfo	4.6517	.47841	1180
SalePerformance	4.6347	.49559	1180
LongTermAdherence	4.6441	.47900	1180
EfficientConsumerAdherence	4.6288	.51559	1180

#### Correlations

	RefillAbilityForAdherence	SupplyChainInfo	SalePerformance	LongTermAdherence	EfficientConsumerAdherence
--	---------------------------	-----------------	-----------------	-------------------	----------------------------

RefillAbilityForAdherence	Pears on Correlation Sig. (1-tailed)	1	.758**	.759**	.769**	.761**
	Sum of Squares and Cross-products	261.768	201.504	208.866	204.599	217.940
	Covariance	.222	.171	.177	.174	.185
	N	1180	1180	1180	1180	1180
SupplyChainInfo	Pears on Correlation Sig. (1-tailed)	.758**	1	.930**	.909**	.899**
	Sum of Squares and Cross-products	201.504	269.847	259.881	245.712	261.442
	Covariance	.171	.229	.220	.208	.222
	N	1180	1180	1180	1180	1180
SalePerformance	Pears on Correlation Sig. (1-tailed)	.759**	.930**	1	.924**	.896**
	Sum of Squares and Cross-products	201.504	269.847	259.881	245.712	261.442
	Covariance	.171	.229	.220	.208	.222
	N	1180	1180	1180	1180	1180

	Sum of Squares and Cross-products	208.866	259.881	289.575	258.593	270.019
	Covariance	.177	.220	.246	.219	.229
	N	1180	1180	1180	1180	1180
LongTermAdherence	Pearson Correlation	.769**	.909**	.924**	.931**	.931**
	Sig. (1-tailed)	.000	.000	.000	.000	.000
	Sum of Squares and Cross-products	204.599	245.712	258.593	270.508	271.102
	Covariance	.174	.208	.219	.229	.230
	N	1180	1180	1180	1180	1180
EfficientConsumerAdherence	Pearson Correlation	.761**	.899**	.896**	.931**	.931**
	Sig. (1-tailed)	.000	.000	.000	.000	.000



	Sig. (1- tail ed)	.000	.000	.000	.000	.000	.000	
	Su m of Sq uar es and Cro ss- pro duc ts Co vari anc e	263.9 33	202.771	203.095	222.252	197.456	209.471	211.296
	N	1180	1180	1180	1180	1180	1180	1180
RetailOperati onEfficiency	Pe ars on Cor rela tion Sig. (1- tail ed)	.733**	1	.885**	.835**	.743**	.859**	.978**
		.000		.000	.000	.000	.000	.000

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	Sum of Squares and Cross-products Co variance N	202.771	289.636	248.231	250.689	219.516	242.636	285.042
		.172	.246	.211	.213	.186	.206	.242
		1180	1180	1180	1180	1180	1180	1180
SupplyChain InformationSharing	Pearson Correlation Sig. (1-tailed)	.758**	.885**	1	.854**	.745**	.860**	.888**
	Sum of Squares and Cross-products	203.095	248.231	271.681	248.437	213.176	235.231	250.780

	Co vari anc e N	.172 1180	.211 1180	.230 1180	.211 1180	.181 1180	.200 1180	.213 1180
RefillEfficien cyForAdhere nce	Pe ars on Cor rela tion Sig. (1- tail ed) Su m of Sq uar es and Cro ss- pro duc ts Co vari anc e N	.775** .000 222.2 52 .189 1180	.835** .000 250.689 .213 1180	.854** .000 248.437 .211 1180	1 311.575 .264 1180	.840** .000 257.497 .218 1180	.900** .000 263.689 .224 1180	.857** .000 258.941 .220 1180
StockingFore castRefill	Pe ars on Cor rela tion	.700**	.743**	.745**	.840**	1	.793**	.760**

	Sig. (1- tail ed)	.000	.000	.000	.000	.000	.000
	Su m of Sq uar es and Cro ss- pro duc ts Co vari anc e N	197.4 56	219.516	213.176	257.497	301.365	228.516
		.167	.186	.181	.218	.256	.194
		1180	1180	1180	1180	1180	1180
SupplyChain Efficiency	Pe ars on Cor rela tion Sig. (1- tail ed)	.777**	.859**	.860**	.900**	.793**	.883**
		.000	.000	.000	.000	.000	.000

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	Sum of Sq uar es and Cro ss- pro duc ts Co vari anc e N	209.4 71	242.636	235.231	263.689	228.516	275.636	251.042
		.178	.206	.200	.224	.194	.234	.213
		1180	1180	1180	1180	1180	1180	1180
WarehouseS upplyChainF orecast	Pe ars on Cor rela tion Sig. (1- tail ed) Su m of Sq uar es and Cro ss- pro duc ts	.759**	.978**	.888**	.857**	.760**	.883**	1
		.000	.000	.000	.000	.000	.000	
		211.2 96	285.042	250.780	258.941	225.856	251.042	293.305



SalePerformance	Pearson Correlation	.800**	1	.897**	.916**	.927**	.819**
	Sig. (1-tailed)	.000		.000	.000	.000	.000
	Sum of Squares and Cross-products	212.686	267.847	239.981	254.319	266.577	231.802
	Covariance	.180	.227	.204	.216	.226	.197
	N	1180	1180	1180	1180	1180	1180
IncreaseProfitInTime	Pearson Correlation	.783**	.897**	1	.926**	.887**	.779**
	Sig. (1-tailed)	.000	.000		.000	.000	.000
	Sum of Squares and Cross-products	207.784	239.981	267.047	256.553	254.849	219.959
	Covariance	.176	.204	.227	.218	.216	.187
	N	1180	1180	1180	1180	1180	1180
RegionalProfit	Pearson Correlation	.785**	.916**	.926**	1	.888**	.792**
	Sig. (1-tailed)	.000	.000	.000		.000	.000

	Sum of Squares and Cross-products Covariance	216.361	254.319	256.553	287.647	264.851	232.241
	N	1180	1180	1180	1180	1180	1180
SustainProfit	Pearson Correlation	.795**	.927**	.887**	.888**	1	.867**
	Sig. (1-tailed)	.000	.000	.000	.000		.000
	Sum of Squares and Cross-products Covariance	226.940	266.577	254.849	264.851	309.033	263.486
	N	1180	1180	1180	1180	1180	1180
SalePromotion	Pearson Correlation	.721**	.819**	.779**	.792**	.867**	1
	Sig. (1-tailed)	.000	.000	.000	.000	.000	
	Sum of Squares and Cross-products Covariance	202.553	231.802	219.959	232.241	263.486	298.749
	N	1180	1180	1180	1180	1180	1180

\*\* Correlation is significant at the 0.01 level (1-tailed).





<p>Su m of Sq ua re s an d Cr os s- pr od uc ts C ov ari an ce N</p>	<p>264. 379</p>	<p>222.885</p>	<p>196.792</p>	<p>209.471</p>	<p>222.231</p>	<p>209.314</p>	<p>204.4 25</p>	<p>221.57 6</p>
<p>EfficientSale Pe ContinousPr ar ofitPerforma so nce n C orr el ati on Si g. (1- tai le d)</p>	<p>.224 1180</p>	<p>.189 1180</p>	<p>.167 1180</p>	<p>.178 1180</p>	<p>.188 1180</p>	<p>.178 1180</p>	<p>.173 1180</p>	<p>.188 1180</p>
	<p>.776</p>	<p>1</p>	<p>.837**</p>	<p>.895**</p>	<p>.995**</p>	<p>.850**</p>	<p>.856**</p>	<p>.997**</p>
	<p>.000</p>		<p>.000</p>	<p>.000</p>	<p>.000</p>	<p>.000</p>	<p>.000</p>	<p>.000</p>

	Sum of Sq ua re s an d Cr os s- pr od uc ts C ov ari an ce N	222. 885	312.111	256.781	263.615	310.478	256.946	249.6 52	310.84 5
		.189	.265	.218	.224	.263	.218	.212	.264
		1180	1180	1180	1180	1180	1180	1180	1180
LongTermA dherencePri cePerforma nce	Pe ar so n C orr el ati on Si g. (1- tai le d)	.697*	.837**	1	.792**	.839**	.756**	.747**	.840**
		.000	.000		.000	.000	.000	.000	.000

	Su m of Sq ua re s an d Cr os s- pr od uc ts C ov ari an ce N	196. 792	256.781	301.365	229.158	257.139	224.573	214.1 01	257.49 7
		.167	.218	.256	.194	.218	.190	.182	.218
		1180	1180	1180	1180	1180	1180	1180	1180
EfficientCon sumerAdher ence	Pe ar so n C orr el ati on Si g. (1- tai le d)	.773 <sup>*</sup>	.895 <sup>**</sup>	.792 <sup>**</sup>	.1	.897 <sup>**</sup>	.874 <sup>**</sup>	.864 <sup>**</sup>	.898 <sup>**</sup>
		.000	.000	.000		.000	.000	.000	.000

<p style="text-align: center;">Sum of Sq ua re s an d Cr os s- pr od uc ts C ov ari an ce N</p>	<p>209. 471</p>	<p>263.615</p>	<p>229.158</p>	<p>277.929</p>	<p>263.969</p>	<p>249.386</p>	<p>237.8 25</p>	<p>264.32 4</p>
<p>EfficientSale Pe IncreaseAdh ar erence so n C orr el ati on Si g. (1- tai le d)</p>	<p>.178</p>	<p>224</p>	<p>.194</p>	<p>236</p>	<p>224</p>	<p>.212</p>	<p>202</p>	<p>224</p>
	<p>1180</p>	<p>1180</p>	<p>1180</p>	<p>1180</p>	<p>1180</p>	<p>1180</p>	<p>1180</p>	<p>1180</p>
	<p>.774*</p>	<p>.995**</p>	<p>.839**</p>	<p>.897**</p>	<p>1</p>	<p>.852**</p>	<p>.857**</p>	<p>.998**</p>
	<p>.000</p>	<p>.000</p>	<p>.000</p>	<p>.000</p>		<p>.000</p>	<p>.000</p>	<p>.000</p>

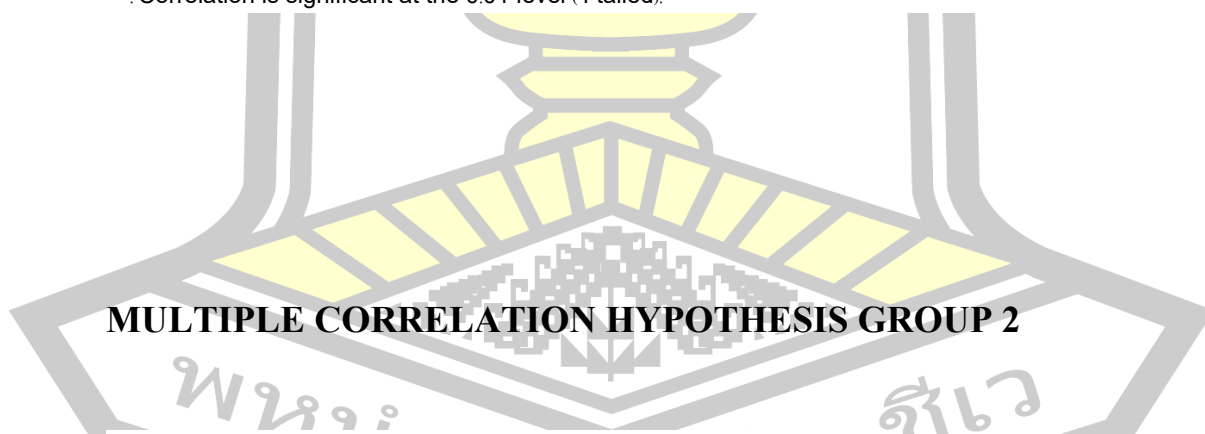




<p>Su m of Sq ua re s an d Cr os s- pr od uc ts C ov ari an ce N</p>	<p>204. 425</p>	<p>249.652</p>	<p>214.101</p>	<p>237.825</p>	<p>249.997</p>	<p>251.376</p>	<p>272.6 19</p>	<p>250.34 2</p>
<p>Continuous Pe SalePromoti ar on so n C orr el ati on Si g. (1- tai le d)</p>	<p>.173</p>	<p>.212</p>	<p>.182</p>	<p>.202</p>	<p>.212</p>	<p>.213</p>	<p>.231</p>	<p>.212</p>
	<p>1180</p>	<p>1180</p>	<p>1180</p>	<p>1180</p>	<p>1180</p>	<p>1180</p>	<p>1180</p>	<p>1180</p>
	<p>.772'</p>	<p>.997**</p>	<p>.840**</p>	<p>.898**</p>	<p>.998**</p>	<p>.853**</p>	<p>.859**</p>	<p>1</p>
	<p>.000</p>	<p>.000</p>	<p>.000</p>	<p>.000</p>	<p>.000</p>	<p>.000</p>	<p>.000</p>	

Sum of Squares	221.576	310.845	257.497	264.324	311.210	257.671	250.342	311.575
Cross-products	.188	.264	.218	.224	.264	.219	.212	.264
N	1180	1180	1180	1180	1180	1180	1180	1180

\*\* Correlation is significant at the 0.01 level (1-tailed).



**MULTIPLE CORRELATION HYPOTHESIS GROUP 2**

**Descriptive Statistics**

	Mean	Std. Deviation	N
ProductionStrategy	1.6396	.47522	1180
StrategicWarehouseSynchronize	4.6568	.49424	1180
SynchronizeDisruptionMinimize	4.6280	.50918	1180



RetailSynchronizeStock	4.6229	.52840	1180
RetailRestockStrategy	4.6339	.49239	1180
RetailSynchronizeStrategic Production	4.6551	.48613	1180
WarehouseSustainable	4.6415	.49025	1180
EfficientRetailWareHouse	4.6364	.51197	1180
DeliveryStrategicForecast	4.6559	.47526	1180
ManufactureForecastStock	4.6415	.48503	1180

**Correlations**

	Pro duct ionS trate gy	Strategi cWareh ouseSy nchroniz e	Synchro nizeDis ruptionM inimize	Retail Sync hroni zeSto ck	Retai lRest ockS trate gy	ReteailSy nchronize StrategicP roduction	Ware hous eSust ainab le	Efficie ntRet ailWar eHous e	Delive ryStra tegicF oreca st	Manuf acture Forec astSto ck
Product ionStrategy  P e a r s o n C o r r e l a t i o n S i g. (1- ta ile d)	1	.699**  .000	.734**  .000	.747**  .000	.745**  .000	.728**  .000	.748**  .000	.674**  .000	.765**  .000	.742**  .000



Strategic Warehouses eSynchronize	P e ar s o n C or re la ti o n Si g. (1- ta ile d)	.699 1	.857"	.745"	.863"	.785"	.787"	.693"	.790"	.880"
		.000	.000	.000	.000	.000	.000	.000	.000	.000





Synchroni zeDisrupti onMinimiz e	P e ar s o n C or re la ti o n Si g. (1- ta ile d)	.734'	.857"	1	.790"	.931"	.838"	.835"	.724"	.845"	.943"
		.000	.000		.000	.000	.000	.000	.000	.000	.000





RetailSyn P chronizeSt e ock	.747'	.745"	.790"	1	.809"	.804"	.859"	.797"	.922"	.826"
ar s o n C or re la ti o n Si g. (1- ta ile d)	.000	.000	.000		.000	.000	.000	.000	.000	.000







RetailRest P ockStrate e gy ar s o n C or re la ti o n Si g. (1- ta ile d)	.745°	.863°	.931°	.809°	1	.858°	.854°	.740°	.864°	.974°
	.000	.000	.000	.000		.000	.000	.000	.000	.000





ReteailSy nchronize StrategicP roduction	P e ar s o n C or re la ti o n Si g. (1- ta ile d)	.728°	.785°	.838°	.804°	.858°	1	.826°	.702°	.852°	.871°
		.000	.000	.000	.000	.000		.000	.000	.000	.000





Warehouse P eSustaina e ble ar s o n C or re la ti o n Si g. (1- ta ile d)	.748°	.787°	.835°	.859°	.854°	.826°	1	.764°	.894°	.868°
	.000	.000	.000	.000	.000	.000		.000	.000	.000



S u m o f S q u a r e s a n d C r o s s - p r o d u c t s C o v a r i a n c e N	205. 509	224.818	245.630	262.4 79	243.1 39	232.101	283.3 65	226.2 14	245.4 59	243.36 5
	.174	.191	.208	.223	.206	.197	.240	.192	.208	.206
	118 0	1180	1180	1180	1180	1180	1180	1180	1180	1180

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EfficientR etailWare House	P e ar s o n C or re la ti o n Si g. (1- ta ile d)	.674 <sup>*</sup>	.693 <sup>**</sup>	.724 <sup>**</sup>	.797 <sup>**</sup>	.740 <sup>**</sup>	.702 <sup>**</sup>	.764 <sup>**</sup>	1	.782 <sup>**</sup>	.759 <sup>**</sup>
		.000	.000	.000	.000	.000	.000	.000		.000	.000







DeliverySt rategicFor ecast	P e ar s o n C or re la ti o n Si g. (1- ta ile d)	.765°	.790"	.845"	.922"	.864"	.852"	.894"	.782"	1	.881"
		.000	.000	.000	.000	.000	.000	.000	.000		.000





Manufacture reForecas tStock	P e ar s o n C or re la ti o n Si g. (1- ta ile d)	.742'	.880"	.943"	.826"	.974"	.871"	.868"	.759"	.881"	1
		.000	.000	.000	.000	.000	.000	.000	.000	.000	



S u m o f S q u a r e s a n d C r o s s - p r o d u c t s C o v a r i a n c e N	201. 559	248.818	274.630	249.4 79	274.1 39	242.101	243.3 65	222.2 14	239.4 59	277.36 5
	.171	.211	.233	.212	.233	.205	.206	.188	.203	.235
	118 0	1180	1180	1180	1180	1180	1180	1180	1180	1180

\*\* Correlation is significant at the 0.01 level (1-tailed).

**Descriptive Statistics**

	Mean	Std. Deviation	N
ManufacturerFullfillDemand OnTime	1.6413	.47553	1180

EffectiveRefillOrderOperation	4.6432	.48453	1180
OrderRestockDemandMet	4.6492	.49830	1180
SynchronizeOrderEfficientOperation	4.6364	.49169	1180
SynchronizeOperationMeetDemand	4.6551	.48613	1180
SupplyChainOperationEfficient	4.6415	.49025	1180
SynchronizeOrderEfficientStorage	4.6390	.51129	1180
EfficientManufacturingOnTime	4.6602	.48970	1180
EfficientSustainWhileDemandOnRise	4.6559	.47526	1180

**Correlations**

	ManufacturerFullfillDemandOnTime	EffectiveRefillOrderOperation	OrderRestockDemandMet	SynchronizeOrderEfficientOperation	SynchronizeOperationMeetDemand	SupplyChainOperationEfficient	SynchronizeOrderEfficientStorage	EfficientManufacturingOnTime	EfficientSustainWhileDemandOnRise
ManufacturerFullfillDemandOnTime Correlation	1	.740**	.663**	.741**	.727**	.750**	.674**	.700**	.767**



Effective P RefillOrd e erOperati ar on s o n C or re la ti o n Si g. (1 - ta il e d)	.740"	1	.890"	.965"	.874"	.868"	.757"	.890"	.885"
	.000		.000	.000	.000	.000	.000	.000	.000







OrderRe P stockDe e mandMet ar s o n C or re la ti o n Si g. (1 - ta il e d)	663"	.890"	1	.888"	.799"	.787"	.674"	.846"	.801"
	.000	.000		.000	.000	.000	.000	.000	.000



S u m o f S q u a r e s a n d C r o s s- p r o d u c t s C o v a r i a n c e N	185.186	253.293	292.749	256.486	228.205	226.592	202.539	243.310	223.556
	.157	.215	.248	.218	.194	.192	.172	.206	.190
	1180	1180	1180	1180	1180	1180	1180	1180	1180



Synchro nizeOrde rEfficient Operatio n	P e ar s o n C or re la ti o n Si g. (1 - ta il e d)	.741"	.965"	.888"	1	.852"	.849"	.739"	.871"	.858"
		.000	.000	.000		.000	.000	.000	.000	.000



S u m o f S q u a r e s a n d C r o s s- p r o d u c t s C o v e r a r i a n c e N	204.205	270.94 2	256.4 86	285.033	240.031	241.21 4	219.124	247.21 3	236.395
	.173	.230	.218	.242	.204	.205	.186	.210	.201
	1180	1180	1180	1180	1180	1180	1180	1180	1180



Synchro nizeOper ationMee tDemand	P e ar s o n C or re la ti o n Si g. (1 - ta il e d)	.727**	.874**	.799**	.852**	1	.826**	.696**	.790**	.852**
		.000	.000	.000	.000		.000	.000	.000	.000



S u m o f S q u a r e s a n d C r o s s- p r o d u c t s C o v a r i a n c e N	198.097	242.79 1	228.2 05	240.031	278.619	232.10 1	204.066	221.68 9	231.964
	.168	.206	.194	.204	.236	.197	.173	.188	.197
	1180	1180	1180	1180	1180	1180	1180	1180	1180



Supply Chain Operation Efficient	P er for s o n C or re la ti o n Si g. (1 - ta il e d)	.750"	.868"	.787"	.849"	.826"	1	.759"	.799"	.894"
		.000	.000	.000	.000	.000		.000	.000	.000



S u m o f S q u a r e s a n d C r o s s- p r o d u c t s C o v a r i a n c e N	206.208	243.08 2	226.5 92	241.214	232.101	283.36 5	224.290	226.25 2	245.459
	.175	.206	.192	.205	.197	.240	.190	.192	.208
	1180	1180	1180	1180	1180	1180	1180	1180	1180





Synchro nizeOrde rEfficient Storage	P e ar s o n C or re la ti o n Si g. (1 - ta il e d)									
		674"	.757"	674"	.739"	.696"	.759"	1	.699"	.776"
		.000	.000	.000	.000	.000	.000		.000	.000



S u m o f S q u a r e s a n d C r o s s- p r o d u c t s C o v a r i a n c e N	193.182	221.01 2	202.5 39	219.124	204.066	224.29 0	308.207	206.23 2	222.427
	.164	.187	.172	.186	.173	.190	.261	.175	.189
	1180	1180	1180	1180	1180	1180	1180	1180	1180



Efficient Manufacturing OnTime	P e a r s o n C o r r e l a t i o n S i g n i f i c a n t	.700**	.890**	.846**	.871**	.790**	.799**	.699**	1	.802**
	(1-tailed)	.000	.000	.000	.000	.000	.000	.000		.000



S u m o f S q u a r e s a n d C r o s s- p r o d u c t s C o v a r i a n c e N	192.250	248.931	243.310	247.213	221.689	226.252	206.232	282.728	220.029
	.163	.211	.206	.210	.188	.192	.175	.240	.187
	1180	1180	1180	1180	1180	1180	1180	1180	1180



Efficient Sustain WhileDe mandOn Rise	P e ar s o n C or re la ti o n Si g. (1 - ta il e d)	.767**	.885**	.801**	.858**	.852**	.894**	.776**	.802**	1
		.000	.000	.000	.000	.000	.000	.000	.000	





RetailLogisticStrategy	4.6475	.50890	1180
SupplyChainEfficient	4.6381	.49122	1180
EfficientLogisticStrategy	4.6602	.48970	1180



### Correlations

		WarehouseStrategyEfficient	StrategicEfficientDelivery	RetailStockingEfficiency	RetailLogisticStrategy	SupplyChainEfficient	EfficientLogisticStrategy
WarehouseStrategyEfficient	Pearson Correlation Sig. (1-tailed)	1	.730**	.635**	.665**	.737**	.700**
	Sum of Squares and Cross-products Covariance	266.605	196.432	175.361	189.769	202.923	192.250
	N	1180	1180	1180	1180	1180	1180
StrategicEfficientDelivery	Pearson Correlation Sig. (1-tailed)	.730**	1	.844**	.722**	.936**	.892**
		.000		.000	.000	.000	.000

	Sum of Squares and Cross-products Covariance	.167	.230	.200	.176	.221	.210
	N	1180	1180	1180	1180	1180	1180
RetailStockingEfficiency	Pearson Correlation Sig. (1-tailed)	.635**	.844**	1	.677**	.856**	.837**
	Sum of Squares and Cross-products Covariance	.000	.000		.000	.000	.000
	N	1180	1180	1180	1180	1180	1180
	Sum of Squares and Cross-products Covariance	.149	.200	.243	.170	.207	.202
	N	1180	1180	1180	1180	1180	1180
RetailLogisticStrategy	Pearson Correlation	.665**	.722**	.677**	1	.728**	.693**





EfficientLogisticStrategy	Pearson Correlation Sig. (1-tailed)	.700**	.892**	.837**	.693**	.874**	1
	Sum of Squares and Cross-products Covariance	.000	.000	.000	.000	.000	
		192.250	247.048	238.107	203.631	247.892	282.728
		.163	.210	.202	.173	.210	.240
	N	1180	1180	1180	1180	1180	1180

\*\* Correlation is significant at the 0.01 level (1-tailed).

**Descriptive Statistics**

	Mean	Std. Deviation	N
RetailStockingEfficiency	1.6413	.47553	1180
StockingMeetUrgentMarket	4.6678	.49233	1180
EfficientDelivery	4.6627	.48362	1180
WarehouseEfficiencyPerforms	4.6475	.48850	1180
WarehouseDeliveryOnTime	4.6390	.49098	1180
EfficientWarehouseOperationStrategy	4.6390	.51129	1180

**Correlations**

	RetailStockingEfficiency	StockingMeetUrgentMarket	EfficientDelivery	WarehouseEfficiencyPerforms	WarehouseDeliveryOnTime	EfficientWarehouseOperationStrategy	
RetailStockingEfficiency	Person Correlation Sig. (1-tailed)	1	.634**	.713**	.755**	.738**	.674**
Sum of Squares and Cross-products Covariance	266.605	175.078	193.326	206.719	203.282	193.182	
N	1180	1180	1180	1180	1180	1180	
StockingMeetUrgentMarket	Person Correlation Sig. (1-tailed)	1	.634**	.747**	.733**	.844**	.665**
	.000		.000	.000	.000	.000	

	Sum of Squares and Cross-products Covariance	.148	.242	.178	.176	.204	.167
	N	1180	1180	1180	1180	1180	1180
EfficientDelivery	Pearson Correlation Sig. (1-tailed)	.713**	.747**	.1	.796**	.837**	.701**
	Sum of Squares and Cross-products	193.326	209.783	275.759	221.688	234.315	204.315

	Cov aria nce N	.164 1180	.178 1180	.234 1180	.188 1180	.199 1180	.173 1180
WarehouseEffici encyPerforms	Pea rso n Cor rela tion Sig. (1- taile d) Su m of Squ are s and Cro ss- pro duct s Cov aria nce N	.755** .000 206.719 .175 1180	.733** .000 207.803 .176 1180	.796** .000 221.6 88 .188 1180	1 281.342 .239 1180	.834** .000 235.817 .200 1180	.753** .000 221.817 .188 1180
WarehouseDeli veryOnTime	Pea rso n Cor rela tion Sig. (1- taile d)	.738** .000	.844** .000	.837** .000	.834** .000	1	.734** .000

	Sum of Squares and Cross-products Covariance	203.282	240.481	234.315	235.817	284.207	217.207
	N	1180	1180	1180	1180	1180	1180
Efficient Warehouse Operation Strategy	Pearson Correlation Sig. (1-tailed)	.674**	.665**	.701**	.753**	.734**	1
	Sum of Squares and Cross-products	193.182	197.481	204.315	221.817	217.207	308.207







	Covariance	.170	.235	.229	.206	.206	.211	.203	.215
	N	1180	1180	1180	1180	1180	1180	1180	1180
EffectiveL ogisticStra tegy	Pea rson Cor rela tion Sig. (1- taile d)	.741**	.963**	1	.852**	.849**	.871**	.858**	.888**
	Su m of Squ are s and Cro ss- pro duc ts Cov aria nce	204.205	270.578	285.033	240.031	241.214	247.213	236.395	256.486
	N	1180	1180	1180	1180	1180	1180	1180	1180
VisibilityR eStocking Order	Pea rson Cor rela tion Sig. (1- taile d)	.727**	.873**	.852**	1	.826**	.790**	.852**	.799**
		.000	.000	.000		.000	.000	.000	.000

	Sum of Squ are s and Cro ss- pro duc ts Cov aria nce N	198.097	242.446	240.031	278.619	232.10 1	221.6 89	231.964	228.205
		.168	.206	.204	.236	.197	.188	.197	.194
		1180	1180	1180	1180	1180	1180	1180	1180
Warehous eReorder	Pea rso n Cor rela tion Sig. (1- taile d) Su m of Squ are s and Cro ss- pro duc ts	.750**	.866**	.849**	.826**	1	.799**	.894**	.787**
		.000	.000	.000	.000		.000	.000	.000
		206.208	242.724	241.214	232.101	283.36 5	226.2 52	245.459	226.592



	Sum of Squares and Cross-products Covariance	.173	.203	.201	.197	.208	.187	.226	.190
	N	1180	1180	1180	1180	1180	1180	1180	1180
ForecastRetailOrder	Person Correlation Sig. (1-tailed)	.663**	.888**	.888**	.799**	.787**	.846**	.801**	.1
	Sum of Squares and Cross-products	185.186	252.942	256.486	228.205	226.592	243.310	223.556	292.749



Sum of Squares and Cross-products Covariance	266.605	200.434	186.837	185.621	191.196	204.356	193.182	206.208	200.975
N	1180	1180	1180	1180	1180	1180	1180	1180	1180
ForecastRetailOrder	.730**	.1	.846**	.861**	.818**	.840**	.737**	.832**	.948**
(1-tailed)	.000		.000	.000	.000	.000	.000	.000	.000
Pe ars on Co rre lati on Si g. (1- tail ed)									

ศูนย์ ประสิทธิภาพ

Su m of Sq ua res an d Cr os s- pr od uct s Co var ian ce N	200.434	282.508	237.831	247.068	227.186	230.492	217.373	235.441	265.153
ReOrderEf fective	.685**	.846**	.1	.820**	.799**	.783**	.681**	.785**	.872**
(1- tail ed)	.000	.000	.000	.000	.000	.000	.000	.000	.000

ศูนย์ ประสิทธิภาพ

Sum of Squares and Cross-products Covariance	186.837	237.831	279.440	234.144	220.771	213.469	199.842	220.836	242.499
N	1180	1180	1180	1180	1180	1180	1180	1180	1180
OrderCreation	.666**	.861**	.820**	.1	.778**	.800**	.667**	.779**	.883**
PeersEffectiveness	.000	.000	.000		.000	.000	.000	.000	.000
Correlation									
Significance (1-tailed)									

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Sum of Squares and Cross-products Covariance N	185.621	247.068	234.144	291.542	219.492	222.932	199.983	224.025	250.720
EffectiveSynchronizelogistic Pearson Correlation Sig. (1-tailed)	.157	.210	.199	.247	.186	.189	.170	.190	.213
	1180	1180	1180	1180	1180	1180	1180	1180	1180
EffectiveSynchronizelogistic Pearson Correlation Sig. (1-tailed)	.709**	.818**	.799**	.778**	.1	.819**	.673**	.799**	.843**
	.000	.000	.000	.000		.000	.000	.000	.000

กลุ่ม ปณ. ที. โตะ ช. ๖

Su m of Sq ua res an d Cr os s- pr od uct s Co var ian ce N	191.196	227.186	220.771	219.492	273.102	220.814	195.203	222.195	231.856
EfficientLo gisticOper ation	.767**	.840**	.783**	.800**	.819**	1	.776**	.894**	.885**
Pe ars on Co rre lati on Si g. (1- tail ed)	.000	.000	.000	.000	.000		.000	.000	.000

กลุ่ม ปณ. ที. โตะ ช. ๖

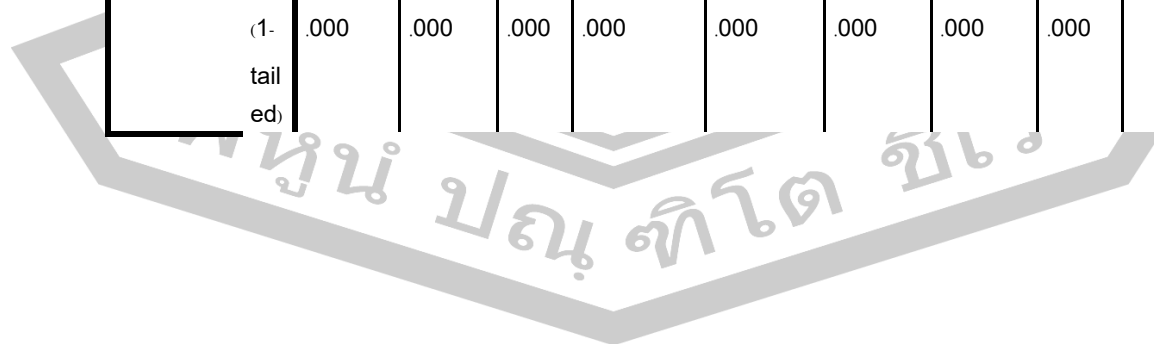
Sum of Squares and Cross-products Covariance	204.356	230.492	213.469	222.932	220.814	266.308	222.427	245.459	240.147
N	1180	1180	1180	1180	1180	1180	1180	1180	1180
VisibilityR eStocking Order	.674**	.737**	.681**	.667**	.673**	.776**	.1	.759**	.757**
(1-tailed)	.000	.000	.000	.000	.000	.000		.000	.000

กลุ่ม ปณ. ที. โตะ ช. ๖

Su m of Sq ua res an d Cr os s- pr od uct s Co var ian ce N	193.182	217.373	199.842	199.983	195.203	222.427	308.207	224.290	221.012
Warehous eReorder Pe ars on Co rre lati on Si g. (1- tail ed)	.164	.184	.170	.170	.166	.189	.261	.190	.187
	1180	1180	1180	1180	1180	1180	1180	1180	1180
	.750**	.832**	.785**	.779**	.799**	.894**	.759**	1	.868**
	.000	.000	.000	.000	.000	.000	.000		.000

กลุ่ม ปณ. ที. โตะ ช. ๖

Su m of Sq ua res and Cr os s- pr od uct s Co var ian ce N	206.208	235.44 1	220. 836	224.025	222.195	245.459	224.290	283.3 65	243.08 2
HighDema ndReOrde r	.740**	.948**	.872**	.883**	.843**	.885**	.757**	.868**	1
Si g. (1- tail ed)	.000	.000	.000	.000	.000	.000	.000	.000	



Sum of Squares and Cross-products Covariance	200.975	265.153	242.499	250.720	231.856	240.147	221.012	243.082	276.796
	.170	.225	.206	.213	.197	.204	.187	.206	.235
N	1180	1180	1180	1180	1180	1180	1180	1180	1180

\*\* Correlation is significant at the 0.01 level (1-tailed).

#### Descriptive Statistics

	Mean	Std. Deviation	N
OperationEfficientlySaveExpense	1.6387	.47628	1180
SaveCostOperation	4.6534	.49701	1180
HighDemandReorder	4.6576	.48531	1180
RetailSynchronizeManufacturingOperation	4.6364	.49169	1180
VisibilityReStockingOrder	4.6390	.51129	1180
WarehouseReorder	4.6415	.49025	1180
EffectiveOrderfulfillmentTiming	4.6432	.48453	1180
ForecastRetailOrder	4.6559	.47526	1180
ForecastOperationOnDemand	4.6602	.48970	1180

**Correlations**

	Operation Efficiently Save Expenditure	Save Cost Operation	High Demand and Reorder	Retail Synchronize Manufacturing Operation	Visibility ReStocking Order	Warehouse Reorder	Effective Orderfulfillment Timing	Forecast Retail Order	Forecast Operation On Demand
Operation Efficiently Save Expenditure	1	.648**	.716**	.736**	.669**	.745**	.735**	.762**	.695**
Partial Correlation Coefficient		.000	.000	.000	.000	.000	.000	.000	.000
Sum of Squares and Cross-products	267.445	180.940	195.146	203.115	192.098	205.132	199.905	203.324	191.230

	C ov ari an ce N	.227	.153	.166	.172	.163	.174	.170	.172	.162
		1180	1180	1180	1180	1180	1180	1180	1180	1180
SaveCostO peration	P ea rs on C or rel ati on Si g. (1- tai le d) S u m of S qu ar es an d Cr os s- pr od uc ts	.648**	1	.788**	.879**	.669**	.778**	.881**	.791**	.854**
		.000		.000	.000	.000	.000	.000	.000	.000
		180.940	291. 236	223.9 69	253.304	200.34 4	223. 384	250.077	220.2 76	245.009





	C ov ari an ce N	.166	.190	.236	.203	.174	.195	.206	.195	.189
		1180	1180	1180	1180	1180	1180	1180	1180	1180
RetailSynch ronizeManuf acturingOpe ration	P ea rs on C or rel ati on Si g. (1- tai le d) S u m of S qu ar es an d Cr os s- pr od uc ts	.736**	.879**	.850**	1	.739**	.849**	.965**	.858**	.871**
		.000	.000	.000		.000	.000	.000	.000	.000
		203.115	253.304	239.122	285.033	219.124	241.214	270.942	236.395	247.213

	C ov ari an ce N	.172	.215	.203	.242	.186	.205	.230	.201	.210
		1180	1180	1180	1180	1180	1180	1180	1180	1180
VisibilityRes tockingOrder	P ea rs on C or rel ati on Si g. (1- tai le d) S u m of S qu ar es an d Cr os s- pr od uc ts	.669"	.669"	.701"	.739"	1	.759"	.757"	.776"	.699"
		.000	.000	.000	.000		.000	.000	.000	.000
		192.098	200. 344	205.1 49	219.124	308.20 7	224. 290	221.012	222.4 27	206.232

	C ov ari an ce N	.163	.170	.174	.186	.261	.190	.187	.189	.175
		1180	1180	1180	1180	1180	1180	1180	1180	1180
Warehouse Reorder	P ea rs on C or rel ati on Si g. (1- tai le d) S u m of S qu ar es an d Cr os s- pr od uc ts	.745**	.778**	.821**	.849**	.759**	1	.868**	.894**	.799**
		.000	.000	.000	.000	.000		.000	.000	.000
		205.132	223. 384	230.1 76	241.214	224.29 0	283. 365	243.082	245.4 59	226.252



	Covariance	.170	.212	.206	.230	.187	.206	.235	.204	.211
	N	1180	1180	1180	1180	1180	1180	1180	1180	1180
ForecastRetailOrder	Pearson Correlation Coefficient (1-tailed)	.762**	.791**	.846**	.858**	.776**	.894**	.885**	1	.802**
	Sum of Squares and Cross-products	203.324	220.276	229.997	236.395	222.427	245.459	240.147	266.308	220.029

	Covariance	.172	.187	.195	.201	.189	.208	.204	.226	.187
	N	1180	1180	1180	1180	1180	1180	1180	1180	1180
ForecastOperationOnDemand	Percentage of Sales	.695**	.854**	.795**	.871**	.699**	.799**	.890**	.802**	1
	Standard Deviation	.000	.000	.000	.000	.000	.000	.000	.000	
	Sum of Squares and Cross-products	191.230	245.009	222.708	247.213	206.232	226.252	248.931	220.029	282.728







Si g. (1- tai le d)	.000		.000	.000	.000	.000	.000	.000	.000
Su m of Sq ua re s an d Cr os s- pr od uc ts C ov ari an ce N	166.512	292.91 2	181.864	198.3 41	193.8 56	173.9 42	192.1 85	188.505	276.53 6
	.141	.248	.154	.168	.164	.148	.163	.160	.235
	1180	1180	1180	1180	1180	1180	1180	1180	1180
MarketGro wthSynchro nize									
Pe ar so n C orr el ati on	.714**	.639**	1	.826**	.856**	.796**	.824**	.792**	.694**

Si g. (1- tai le d)	.000	.000		.000	.000	.000	.000	.000	.000
Su m of Sq ua re s an d	192.625	181.86 4	276.407	229.6 78	239.9 32	225.3 73	222.7 46	221.085	202.59 3
Cr os s- pr od uc ts									
C ov ari an ce	.163	.154	.234	.195	.204	.191	.189	.188	.172
N	1180	1180	1180	1180	1180	1180	1180	1180	1180
ForecastMa rketPlan									
Pe ar so n C orr el ati on	.739"	.693"	.826"	1	.834"	.749"	.861"	.788"	.748"

Si g. (1- tai le d)	.000	.000	.000		.000	.000	.000	.000	.000
Su m of Sq ua re s an d	200.557	198.34 1	229.678	279.8 47	234.9 70	213.5 88	234.0 26	221.375	219.62 2
Cr os s- pr od uc ts									
C ov ari an ce	.170	.168	.195	.237	.199	.181	.198	.188	.186
N	1180	1180	1180	1180	1180	1180	1180	1180	1180
PurchaseR awMaterial									
Pe ar so n C orr el ati on	.731"	.672"	.856"	.834"	1	.873"	.837"	.858"	.732"

Sign- (1-tai- le- d) Su- m- of Sq- ua- re- s- an- d Cr- os- s- pr- od- uc- ts C- ov- ari- an- ce N	.000	.000	.000	.000	.000	.000	.000	.000	.000
	199.721	193.856	239.932	234.970	283.928	250.771	229.292	242.653	216.568
	.169	.164	.204	.199	.241	.213	.194	.206	.184
	1180	1180	1180	1180	1180	1180	1180	1180	1180
PurchaseEf- fectively Pe- ar- so- n- C- orr- el- ati- on	.648"	.596"	.796"	.749"	.873"	1	.772"	.836"	.660"



Si g. (1- tai le d)	.000	.000	.000	.000	.000	.000	.000	.000	.000
Su m of Sq ua re s an d Cr os s- pr od uc ts C ov ari an ce N	198.882	192.185	222.746	234.026	229.292	213.717	264.084	213.422	218.954
	.169	.163	.189	.198	.194	.181	.224	.181	.186
	1180	1180	1180	1180	1180	1180	1180	1180	1180
StrategicPr oductionSy nchronized C orr el ati on	.695**	.656**	.792**	.788**	.858**	.836**	.782**	1	.693**





Sig. (1-tailed)	.000	.000	.000	.000	.000	.000	.000	.000	
Sum of Squares	191.265	276.536	202.593	219622	216568	197427	218954	204.315	308.207
Cross-products	.162	.235	.172	.186	.184	.167	.186	.173	.261
N	1180	1180	1180	1180	1180	1180	1180	1180	1180

\*\* Correlation is significant at the 0.01 level (1-tailed).

#### Descriptive Statistics

	Mean	Std. Deviation	N
RetailProfitPerformance	1.6396	.47603	1180
SynchronizeProductionMeet RetailPerformance	4.6695	.49175	1180
SynchronizeLogisticDisrupti onPrevention	4.6644	.48305	1180
ConsumerExpansionPerform ance	4.6415	.51059	1180

ManufacturingMeetMarketGrowth	4.6432	.48453	1180
ManufacturingMeetProfitPerformance	4.6593	.47414	1180
ManufacturingMeetPromotionOrder	4.6602	.48970	1180
ManufacturingMeetMarketDemand	4.6390	.51129	1180
SynchronizeWarehouseEfficiencyMeetRetailPerformance	4.6364	.49169	1180

**Correlations**

	RetailProfitPerformance	SynchronizeProductionMeetRetailPerformance	SynchronizeLogisticDistribution	ConsumerExpansionPerformance	ManufacturingMeetMarketGrowth	ManufacturingMeetProfitPerformance	ManufacturingMeetPromotionOrder	ManufacturingMeetMarketDemand	SynchronizeWarehouseEfficiencyMeetRetailPerformance
RetailProfitPerformance	1								
		.616**	.710**	.665**	.736**	.763**	.697**	.671**	.737**

S i g n i f i c a n c e	.000	.000	.000	.000	.000	.000	.000	.000
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S u m  o f S q u a r e s a n d C r o s s - p r o d u c t s C o v a r i a n c e	267.			190.5	200.26	203.11	191.57	192.45	
	167	170.135	192.372	41	2	0	0	9	203.478
	.227	.144	.163	.162	.170	.172	.162	.163	.173

	N	1180	1180	1180	1180	1180	1180	1180	1180
Synchronize Production MeetRetailPerformance	P								
	C	.616	.750"	.649"	.847"	.757"	.801"	.648"	.846"
	S	.000	.000	.000	.000	.000	.000	.000	.000





Synchronize LogisticDis ruptionPreve ntion	P								
	e								
	a								
	r								
	s								
	o								
	n								
	C	.710							
	o	..	.750"	1	.702"	.869"	.822"	.787"	.697"
	r								.839"
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Consumer Expansion Performance	E	P							
	.665	.649	.702	1	.751	.774	.693	.995	.734
	.000	.000	.000		.000	.000	.000	.000	.000





Manufacturing Market Growth	P								
MeetMarketGrowth	e								
a	r								
s	o								
n	C	.736							
o	r	..	.847"	.869"	.751"	1	.877"	.890"	.757"
r	e								.965"
l	a								
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Manufacturing Performance	Profit	Share	Return	Value	Added	Per	Share	Dividend	Yield
	.763	.757	.822	.774	.877	1	.794	.773	.851
	.000	.000	.000	.000	.000		.000	.000	.000















Synchronize Warehouse EfficiencyM eetRetailPer formance	P								
	e								
	a								
	r								
	s								
	o								
	n								
	C	.737							
	o	..	.846"	.839"	.734"	.965"	.851"	.871"	.739"
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N	1180	1180	1180	1180	1180	1180	1180	1180	1180
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\*\* Correlation is significant at the 0.01 level (1-tailed).

**Descriptive Statistics**

	Mean	Std. Deviation	N
RetailProfitPerformance	1.6110	.48327	1180
ProductionMeetsRetailOrder Efficiently	4.6347	.50239	1180
SynchronizeForecastMeetRetailDemographicGrowth	4.6695	.48829	1180
ManufacturingMeetMarketGrowth	4.6508	.48746	1180
ManufacturingOperationOnTime	4.6763	.49965	1180
ManufacturingMeetPromotionOrder	4.6881	.46891	1180
EfficientWebSynchronizeProduction	4.6780	.49905	1180
ManufacturingMeetMarketDemand	4.6695	.48129	1180
SynchronizationBetweenWarehousesStocks	4.6610	.48419	1180
MachineEfficiencyMeetConsumerExpansion	4.6737	.46905	1180

**Correlations**

	RetailProfitPerformance	ProductionMeetsRetailOrder Efficiently	SynchronizeForecastMeetRetailDemographicGrowth	ManufacturingMeetMarketGrowth	ManufacturingOperationOnTime	ManufacturingMeetPromotionOrder	EfficientWebSynchronizeProduction	ManufacturingMeetMarketDemand	SynchronizationBetweenWarehousesStocks	MachineEfficiencyMeetConsumerExpansion
--	-------------------------	--	--	-------------------------------	------------------------------	---------------------------------	-----------------------------------	-------------------------------	--	--

Retail Profit Performance	P									
erson										
son										
Con										
or	1	.500"	.620"	.643"	.567"	.587"	.564"	.640"	.657"	.678"
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Single										
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tail		.000	.000	.000	.000	.000	.000	.000	.000	.000
ed										
)										

พหุ ประถมศึกษา

S u m  o f S q u a r e s a n d C r o s s - p r o d u c t s C o v a r i a n c e	275 .35 7	143.04 8	172.547	178.6 89	161.5 58	156.8 54	160.33 6	175.3 97	181.357	181.242
	.23 4	.121	.146	.152	.137	.133	.136	.149	.154	.154

	N	1180	1180	1180	1180	1180	1180	1180	1180	1180
Production Meets Retail Order Efficiently	P e a r s o n C o r r e l a t i o n S i g n i f i c a n t a t a i l e d	1	.721**	.781**	.563**	.719**	.539**	.703**	.680**	.689**
		.000	.000	.000	.000	.000	.000	.000	.000	.000

กลุ่ม ปณ ทิโต ชะ





Synchroni zeForecas tMeetReta ilDemogra phicGrowt h	P e a r s o n C o r r e l a t i o n S i g n i f i c a n c e	.62 0"	.721"	1	.844"	.642"	.835"	.600"	.802"	.789"	.784"
	( 1 - t a i l e d )	.00 0	.000		.000	.000	.000	.000	.000	.000	.000





Manufacturing Meeting Market Growth	P								
	e								
	a								
	r								
	s								
	o								
	n								
	C	.64							
	o	3"	.781"	.844"	1	.692"	.878"	.660"	.831"
	r								
	r								
	e								
	l								
	a								
	t								
	i								
	o								
	n								
	S								
	i								
	g								
	.								
	(								
	1	.00							
	-	0	.000	.000		.000	.000	.000	.000
	t								
	a								
	i								
	e								
	d								
	)								





Manufacturing Operation OnTime	P								
	e								
	a								
	r								
	s								
	o								
	n								
	C								
	o	.56							
	r	7"	.563"	.642"	.692"	1	.658"	.918"	.676"
	r								
	e								
	l								
	a								
	t								
	i								
	o								
	n								
	S								
	i								
	g								
	.								
	(								
	1	.00							
	-	0	.000	.000	.000		.000	.000	.000
	t								
	a								
	i								
	e								
	d								
	)								





Manufacturing Promotion Order	P										
ringMeetP	e										
romotionO	a										
rder	r										
	s										
	o										
	n										
	C										
	o	.58									
	r	7"	.719"	.835"	.878"	.658"	1	.611"	.809"	.800"	.794"
	r										
	e										
	l										
	a										
	t										
	i										
	o										
	n										
	S										
	i										
	g										
	.										
	(										
	1	.00									
	-	0	.000	.000	.000	.000		.000	.000	.000	.000
	t										
	a										
	i										
	e										
	d										
	)										







EfficientW P ebSynchr e onizeProd a uction r s o n C o r r e l a t i o n S i g n i f i c a n t a t t e r e d	.56 4"	.539"	.600"	.660"	.918"	.611"	1	.626"	.657"	.681"
	.00 0	.000	.000	.000	.000	.000		.000	.000	.000









Synchroni zationBet weenWar ehousesS tocks	P e a r s o n C o r r e l a t i o n S i g n i f i c a n c e	.65 7"	.680"	.789"	.810"	.703"	.800"	.657"	.815"	1	.865"
	( 1 - t a i l e d )	.00 0	.000	.000	.000	.000	.000	.000	.000	.000	.000





Machine Efficiency	67.8%	.689	.784	.841	.754	.794	.681	.829	.865	1
Power Consumption	.000	.000	.000	.000	.000	.000	.000	.000	.000	
Expansion										

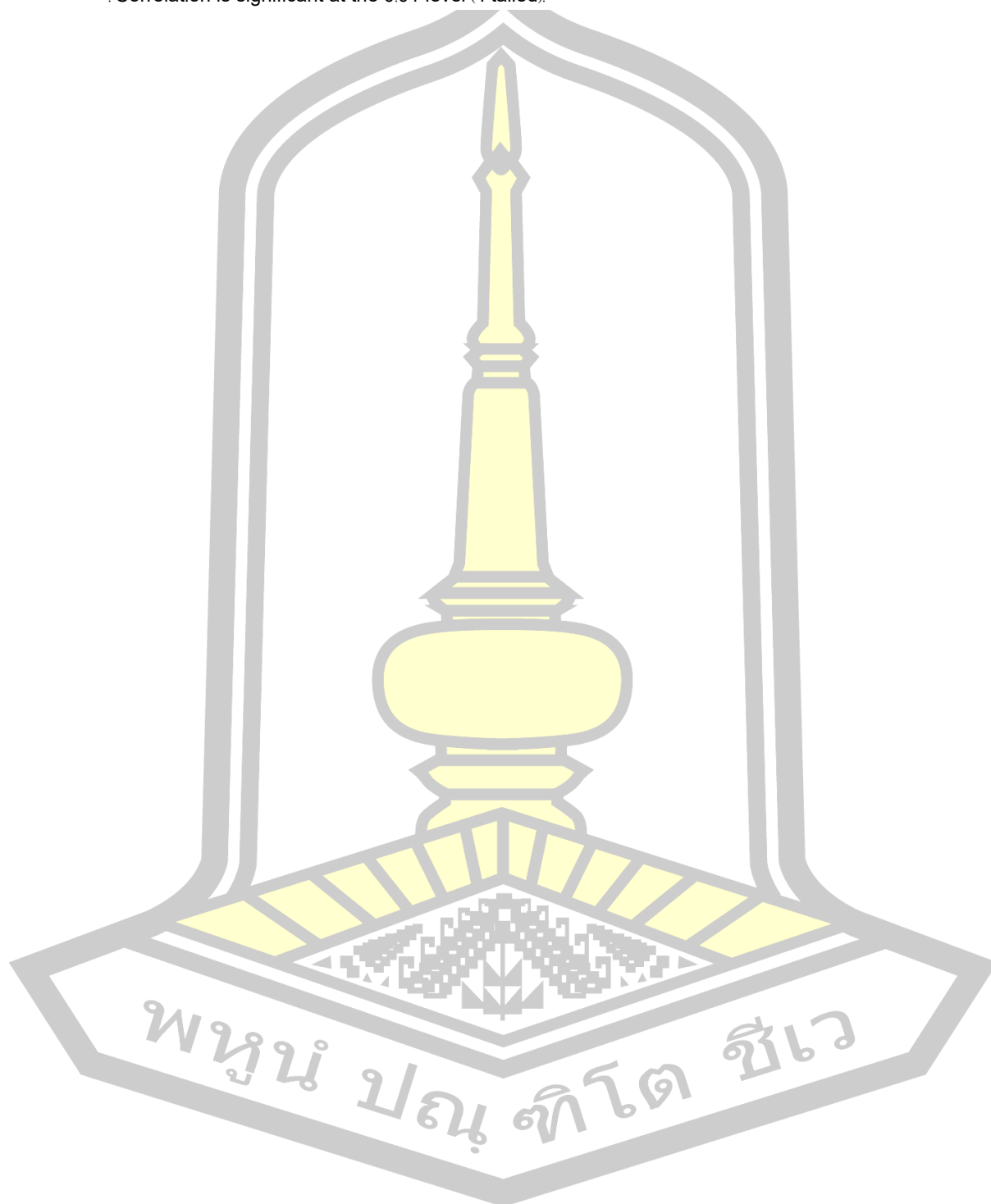






N	118	1180	1180	1180	1180	1180	1180	1180	1180	1180
	0									

\*\* Correlation is significant at the 0.01 level (1-tailed).



## APPENDIX C

### Questionnaires

เรื่อง การประยุกต์ใช้เทคโนโลยีสารสนเทศในการบริหารลูกค้าเพื่อศึกษาผลกำไรที่น่าจะได้รับในภาคธุรกิจค้าปลีกและการผลิตที่มีการบริหารห่วงโซ่อุปทานแบบพร้อมเพรียง

แบบสอบถามชุดนี้แบ่งออกเป็น 8 ตอน ประกอบด้วย

ข้อ	ตอนที่ 1 ข้อมูลทั่วไปของผู้ตอบแบบสอบถาม	21
ข้อ	ตอนที่ 2 แบบสอบถามลูกค้าและการใช้ผลิตภัณฑ์อย่างต่อเนื่อง	51
ข้อ	ตอนที่ 3 แบบสอบถามลูกค้าก่อนใช้การใช้เทคโนโลยีสารสนเทศ เข้าบริหารกิจกรรมชีวิตประจำวัน	8
ข้อ	ตอนที่ 4 แบบสอบถามลูกค้าหลังใช้การใช้เทคโนโลยีสารสนเทศ เข้าบริหารกิจกรรมชีวิตประจำวัน	8
ข้อ	ตอนที่ 5 แบบสอบถามภาคค้าปลีก-ส่งที่ใช้การบริหารร้านค้าแบบเดิม	48
ข้อ	ตอนที่ 6 แบบสอบถามภาคค้าปลีก-ส่งหลังใช้การบริหารแบบพร้อมเพรียง โดยใช้เทคโนโลยีสารสนเทศเข้าเสริมการบริหาร	48
ข้อ	ตอนที่ 7 แบบสอบถามภาคอุตสาหกรรมและการบริหารการผลิตแบบเดิม	49
ข้อ	ตอนที่ 8 แบบสอบถามภาคอุตสาหกรรมหลังใช้การบริหารแบบพร้อมเพรียง โดยใช้เทคโนโลยีสารสนเทศเข้าเสริมการบริหาร	49

การตอบแบบสอบถามการวิจัยฉบับนี้คำตอบของท่านมีความสำคัญอย่างยิ่งต่อการนำไปวิเคราะห์ข้อมูลเพื่อให้ได้งานวิจัยที่สามารถวิเคราะห์ปัญหาอันจะเกิดผลดีต่อการบริหารธุรกิจภายในประเทศได้ในอนาคต ดังนั้นกรุณาตอบทุกประเด็นคำถามให้ครบถ้วนทุกข้อ เพื่อทำให้เกิดความเที่ยงตรงในข้อมูลการวิจัยและจะเกิดประโยชน์ที่แท้จริงตามมา

อนึ่งข้อมูลที่ได้รับจากท่านจะเป็นประโยชน์ต่อการศึกษาการบริหารองค์กรทั้งภาครัฐและเอกชนในอนาคตในส่วนของการบริหารภาคค้าปลีกและภาคอุตสาหกรรมการผลิต ข้อมูลที่ได้จากการตอบแบบสอบถามและการสัมภาษณ์จะถูกเก็บไว้เป็นความลับ และผลที่ได้จากการศึกษาจะนำมาใช้ประมวลผลเพื่อวิเคราะห์และสรุปผลการวิจัยเท่านั้น เพื่อให้เกิดความประจักษ์แก่ผู้อ่านผลงานวิจัย และเพื่อนำไปศึกษาวิจัยต่อในส่วนของข้อมูลการศึกษาที่ยังขาดการพัฒนา

ข้าพเจ้าขอขอบพระคุณที่ท่านได้เสียสละเวลาเพื่อตอบแบบสอบถามทุกข้อตามความจริงที่ปรากฏ อย่างครบถ้วน หากท่านมีความสนใจที่จะขอรับสรุปรายงานเกี่ยวกับงานวิจัยนี้ โปรดแนบชื่อ เบอร์โทร พร้อมระบุหน่วยงานที่เกี่ยวข้องหรือนามบัตรของท่านมาพร้อมกับแบบสอบถามชุดนี้ หากมี ปัญหาหรือข้อสงสัยประการใดที่เกี่ยวข้องกับแบบสอบถาม กรุณาติดต่อข้าพเจ้าที่ เบอร์โทรศัพท์ 0923288885 หรือ อีเมล 63010960004@msu.ac.th

จิริฐิติ ศรีขาว

นิสิตคุศุภบัณฑิต สาขาบริหารธุรกิจและนวัตกรรมดิจิทัล  
คณะบัญชีและการจัดการ มหาวิทยาลัยมหาสารคาม

ลงชื่อ ..... (อาจารย์ที่ปรึกษา

วิทยานิพนธ์)

(ผศ. ดร. กิตติพล...วิแสง) วันที่ ..... เดือน .....

พ.ศ. ....

พณฺณํ ปณฺ ทิโต ชีเว

คำชี้แจง: กรุณาทำเครื่องหมาย ✓ ลงใน ( ) หน้าข้อความที่ตรงกับข้อมูลของผู้ตอบแบบสอบถาม

**ตอนที่ 1: ข้อมูลทั่วไปของผู้ตอบแบบสอบถาม**

1. เพศ

- ( ) 1. ชาย ( ) 2. หญิง  
( ) 3. อื่นๆโปรดระบุ .....

2. อายุ

- ( ) 1. อายุมากกว่า 40 ปี ( ) 2. อายุ 50-60 ปี  
( ) 3. อายุ 60-70 ปี ( ) 4. อายุ 80-90 ปี  
( ) 5. อายุมากกว่า 90 ปี

3. ระดับการศึกษา

- ( ) 1. ไม่ได้รับการศึกษา ( ) 2. ได้รับการศึกษาประถมวัยบางระดับ  
( ) 3. ได้รับการศึกษาจนจบประถมศึกษา ( ) 4. ได้รับการศึกษาถึงชั้นมัธยมบางระดับ  
( ) 5. ได้รับการศึกษาจนจบมัธยมศึกษา ( ) 6. ได้รับการศึกษาจนจบปริญญาตรี  
( ) 7. ได้รับการศึกษาจนจบปริญญาโท ( ) 8. ได้รับการศึกษาจนจบปริญญาเอก

4. รายได้ต่อเดือน

- ( ) 1. ต่ำกว่า 5000 บาท ต่อเดือน ( ) 2. อยู่ในช่วง 5000 – 10000 บาท  
( ) 3. อยู่ในช่วง 10000 – 15000 บาท ( ) 4. อยู่ในช่วง 15000 – 20000 บาท  
( ) 5. อยู่ในช่วง 20000 – 25000 บาท ( ) 6. อยู่ในช่วง 25000 – 30000 บาท  
( ) 7. อยู่ในช่วง 30000 – 35000 บาท ( ) 8. มากกว่า 35000 บาท ต่อเดือน

5. ตำแหน่งงาน

- ( ) 1. พนักงานลูกจ้าง ( ) 2. หัวหน้า  
( ) 3. ผู้บริหาร ( ) 4. อาชีพส่วนตัว  
( ) 5. รับราชการ ( ) 6. อื่นๆโปรดระบุ .....

6. สถานภาพการสมรส

- ( ) 1. โสด ( ) 2. สมรส  
( ) 3. ออย่าร้าง ( ) 4. คู่สมรสถึงแก่กรรม
7. ผู้กรอกแบบฟอร์ม  
( ) 1. กรอกด้วยตนเอง ( ) 2. มีผู้อื่นกรอกให้
8. ผู้กรอกข้อมูลการใช้ผลิตภัณฑ์บนเว็บไซต์  
( ) 1. กรอกด้วยตนเอง ( ) 2. มีผู้อื่นกรอกให้
9. การรับประทานอาหารเสริม  
( ) 1. รับประทานด้วยตนเอง ( ) 2. มีผู้อื่นจัดเตรียมให้
10. การซื้ออาหารเสริม  
( ) 1. ซื้อด้วยตนเองเป็นประจำ ( ) 2. มีผู้อื่นซื้อให้เป็นประจำ  
( ) 3. มีคนซื้อมาให้ทดลองใช้
11. ช่องทางการซื้ออาหารเสริม  
( ) 1. ซื้อที่ร้านเสริมความงาม/เสริมสุขภาพ ( ) 2. ซื้อจากร้านยา  
( ) 3. ซื้อจากร้านยี่ปี่ว ( ) 3. ซื้อจากอินเทอร์เน็ต
12. อาหารเสริมที่ซื้อใช้กรณีใด  
( ) 1. เพื่อบำรุงร่างกายเป็นประจำ ( ) 2. เพื่อรักษาสุขภาพไม่ให้ทรุดโทรม  
( ) 3. เพื่อบำรุงร่างกายเมื่อไม่สบาย
13. อุบนิสัยในการรับประทาน  
( ) 1. เป็นประจำ ( ) 2. 2-3 วันครั้ง  
( ) 3. สัปดาห์ละครั้ง ( ) เดือนละครั้ง
14. หากรับประทานเพื่อป้องกันการเสื่อม  
( ) 1. เพื่อไม่ให้เสื่อมมากกว่าเดิม ( ) 2. อาการเสื่อมทุเลาลง  
( ) 3. บำรุงเพื่อป้องกันการเสื่อม
15. เหตุผลที่รับประทาน  
( ) 1. รับประทานเป็นประจำเพราะได้ผลดี  
( ) 2. รับประทานเป็นประจำเพราะเกรงว่าสุขภาพไม่ดี  
( ) 3. รับประทานเป็นประจำเพราะมีคนทานด้วย  
( ) 4. รับประทานบ้างไม่ทานบ้างเพราะไม่ได้ผล  
( ) 5. รับประทานเป็นประจำเพราะผู้เชี่ยวชาญทางสุขภาพแนะนำ
16. การซื้ออาหารเสริมที่ใช้อยู่ปัจจุบัน  
( ) 1. มักซื้อก่อนหมดทุกครั้ง ( ) 2. หมดก่อนแล้วค่อยซื้อ  
( ) 3. นึกขึ้นได้แล้วค่อยซื้อ
17. อุบนิสัยการลืรับประทาน  
( ) 1. หลงลืมบ้างเป็นครั้งคราว ( ) 2. ทำงานมากแล้วลื

( ) 3. ลืมที่เก็บไว้แล้วหาย

( )

( ) 4. ลืมเพราะมีโรคประจำตัว

5.

อื่นๆโปรด

ระบุ .....

18. ส่วนใหญ่ใช้เวลาทำบ่ออุปกรณ์ชนิดใด

( ) 1. คอมพิวเตอร์/โน้ตบุ๊ก

( )

( ) 2. โทรศัพท์มือถือ

3.

อื่นๆโปรด

ระบุ .....

19. คุณใช้เวลาทำมือถือหรือคอมพิวเตอร์เฉลี่ยวันละกี่ชั่วโมง

( ) 1. 1-2 ชั่วโมง

( ) 2. 2-3 ชั่วโมง

( ) 3. 4-5 ชั่วโมง

( ) 4. มากกว่า 5 ชั่วโมง

20. คุณเข้าร้านยาหรือร้านเสริมสุขภาพร่างกายบ่อยเพียงใด

( ) 1. สัปดาห์ละครั้ง

( ) 2. เดือนละครั้ง

( ) 3. สองเดือนต่อครั้ง

( )

อื่นๆโปรด

ระบุ .....

.....

21. คุณเลือกซื้ออาหารเสริมเพราะเหตุใดเป็นหลัก

( ) 1. มีประโยชน์บำรุง

( ) 2. รสชาติอร่อย

( ) 3. ซื้อตามแฟชั่นหรือความนิยมทางสุขภาพ

( ) 4. มีงานวิจัยรองรับจากสถาบันที่น่าเชื่อถือ

( ) 5. ปริมาณคุ้มค่าเงิน

22. อาหารเสริมที่คุณรับประทานคุณมักบอกคนรู้จักหรือไม่

( ) 1. บอก

( ) 2. ไม่บอก

( ) 3. บอกเมื่อจำได้

( ) 4. คุณบอกต่อเพราะเหตุผลใด

( ) 5. รับประทานแล้วได้ผล

( ) 6. รับประทานแล้วรู้สึกว่าคุณดี

23. อาหารเสริมที่คุณรับประทานเคยใช้นอกข้อบ่งใช้หรือไม่

( ) 1. ไม่เคย

( ) 2. เคยเพราะทราบข้อบ่งใช้

( )

3.

อื่นๆโปรดระบุ

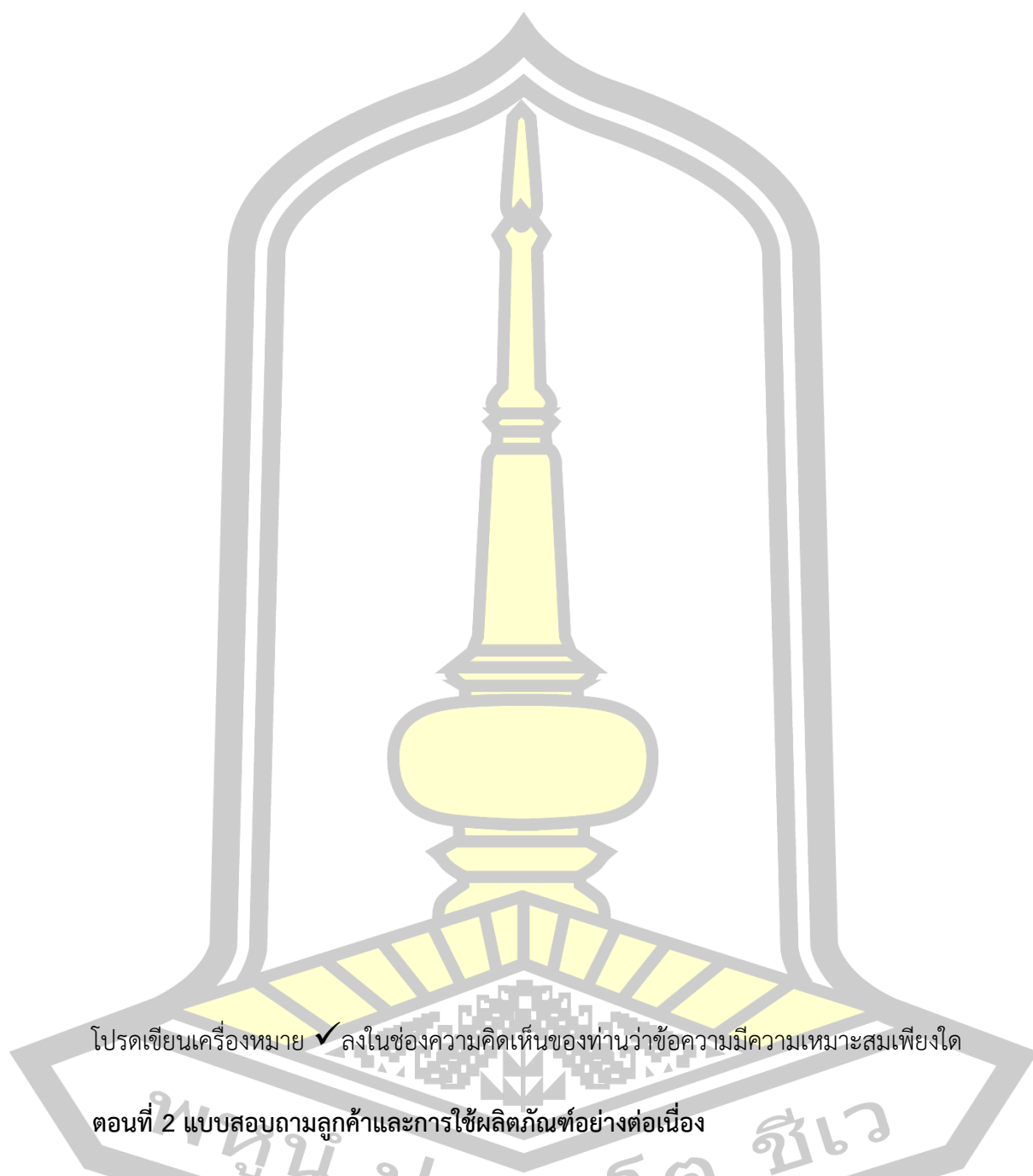
พูน ปลูก ปลูก โท ชั่ว

โปรดเขียนเครื่องหมาย ✓ ลงในช่องความคิดเห็นของท่านว่าข้อความมีความเหมาะสมเพียงใด

ตอนที่ 2 แบบสอบถามลูกค้าและการใช้ผลิตภัณฑ์อย่างต่อเนื่อง

รายการข้อความ	ระดับความคิดเห็น				
	5	4	3	2	1
	มากที่สุด	มาก	ปานกลาง	น้อย	น้อยที่สุด
<b>1<sup>st</sup> Key Factor: Cost-Adherence and Socioeconomic factor ราคาและการใช้ผลิตภัณฑ์อย่างต่อเนื่อง</b>					
1. Bottled-price is continuously affordable.					
2. Price per pill is economical.					
3. Cost-effectiveness per pill is affordable.					
4. Continuation of purchasing product sold at based price is likely.					
5. Food supplement pill is cost-effective alone.					
6. Bottled supplement product fitted well with your lifestyle expenditure monthly.					
7. Travel expenditure affects your power to purchase at higher promotional price.					
8. Food supplement pill is effective in combination with another regimen.					
9. Travel expenditure affects your power to purchase continually at based price.					





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ตอนที่ 2 แบบสอบถามลูกค้าและการใช้ผลิตภัณฑ์อย่างต่อเนื่อง

รายการข้อความ	ระดับความคิดเห็น				
	5	4	3	2	1
	มากที่สุด	มาก	ปานกลาง	น้อย	น้อยที่สุด
2 <sup>nd</sup> Key Factor: Adherence and Satisfaction on base price of products					

purchased. ราคาและความพึงพอใจที่มีผลต่อการใช้อย่างต่อเนื่อง					
10. Price per pill is worth the purchase before considering buying the product.					
11. Price labeled on the bottle was satisfactory at first glance.					
12. Overall product quality was worth the price purchased.					
13. Supplementary pill cost-effectiveness was satisfactory when price-per-unit purchased, when purchased from different store.					
14. Continuation of product usage brings were still satisfactory when it comes to pricing.					
15. Based price on the bottle is economical year-round.					
16. Based price of the product is affordable in multiple bottle purchased for long term usage.					
17. Based price shifts 5-10% gradually from currency inflation is still affordable.					

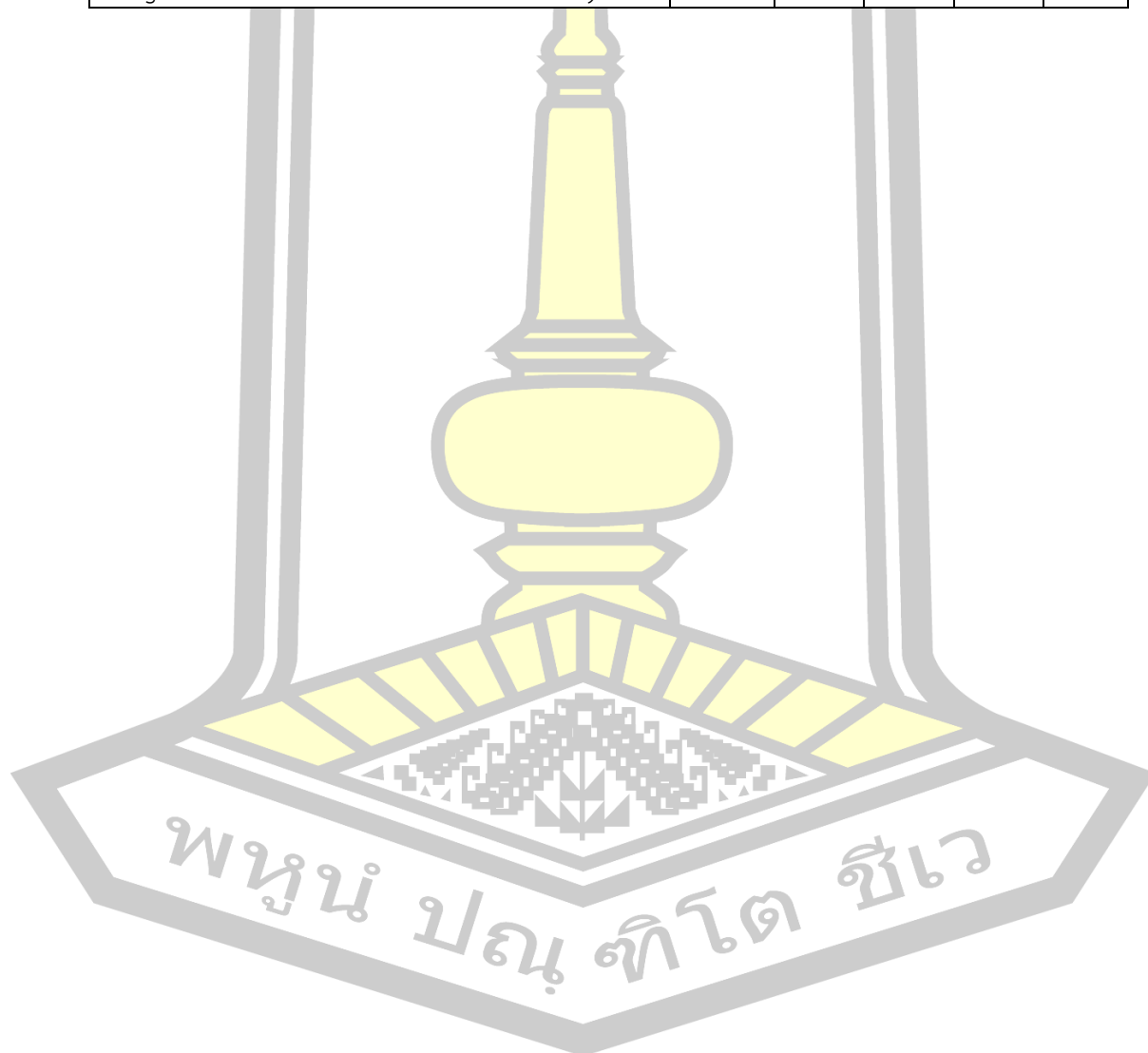


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ตอนที่ 2 แบบสอบถามลูกค้าและการใช้ผลิตภัณฑ์อย่างต่อเนื่อง

รายการข้อความ	ระดับความคิดเห็น				
	5	4	3	2	1
	มากที่สุด	มาก	ปานกลาง	น้อย	น้อยที่สุด
3 <sup>rd</sup> Key Factor: Adherence and Knowledge and perception of consumer ความรู้ของลูกค้าและเข้าใจในผลิตภัณฑ์ที่ทำให้ใช้ผลิตภัณฑ์อย่างต่อเนื่อง					
18. Increasing health severity makes you adhere to product usage.					
19. Product label information provide same level of information as healthcare provider.					
20. Health condition concern you to remind you to repurchase.					
21. Health severity lessens by the product efficacy leverage usage adherence.					
22. Healthcare practitioner provide enough					

information regarding indication.					
23. Healthcare provide you enough knowledge on how to use supplements effectively.					
24. Healthcare provider helps you to understand product correctly.					
25. Enough information was provided regarding your fear of long-term usage.					
26. More adherence is assured in long term usage when discussion clarified its safety.					



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ตอนที่ 2 แบบสอบถามลูกค้าและการใช้ผลิตภัณฑ์อย่างต่อเนื่อง

รายการข้อความ	ระดับความคิดเห็น				
	5	4	3	2	1
	มากที่สุด	มาก	ปานกลาง	น้อย	น้อยที่สุด
<b>4<sup>th</sup> Key Factor: Adherence and Promotion of product sales การโปรโมตสินค้าที่มีผลต่อการใช้ผลิตภัณฑ์ของลูกค้าอย่างต่อเนื่อง</b>					
27. Retailer's promotion affect your decision to continue product usage.					
28. Frequency of promotion remind you to repurchase the product continually.					
39. Product repurchased frequently before promotion ends, with regards to price per pill.					
30. Product promotion urges you to come back to check at store frequently for pricing.					
31. Feelings reached in communication by the retailers on the promotion offered.					
32. Promoted price per bottle make you feel adhere to usage in long term.					
33. Promoted quality per bottled-price stated by health provider makes you feel adhere.					

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ตอนที่ 2 แบบสอบถามลูกค้าและการใช้ผลิตภัณฑ์อย่างต่อเนื่อง

รายการข้อความ	ระดับความคิดเห็น				
	5	4	3	2	1
	มากที่สุด	มาก	ปานกลาง	น้อย	น้อยที่สุด
5 <sup>th</sup> Key Factor: Adherence and Product Education การให้ความรู้ลูกค้าเกี่ยวกับผลิตภัณฑ์ที่มีผลต่อการใช้ผลิตภัณฑ์อย่างต่อเนื่องของลูกค้า					
35. Information from healthcare provider when was easily understood while					

counseling?					
35. Felt more positive on using the product correctly after educated.					
36. Re-counseling isn't needed on how to use the product.					
37. Language level used by healthcare provider wasn't obstacle to your understanding.					
38. Self-educate on product information, its indication, and usage improves adherence.					
39. Further informative itemized discussion with healthcare provider improves adherence.					
40. Healthcare provider answer all your question needed to adhere correctly.					
41. Product education provided suffice your intuition on product information.					



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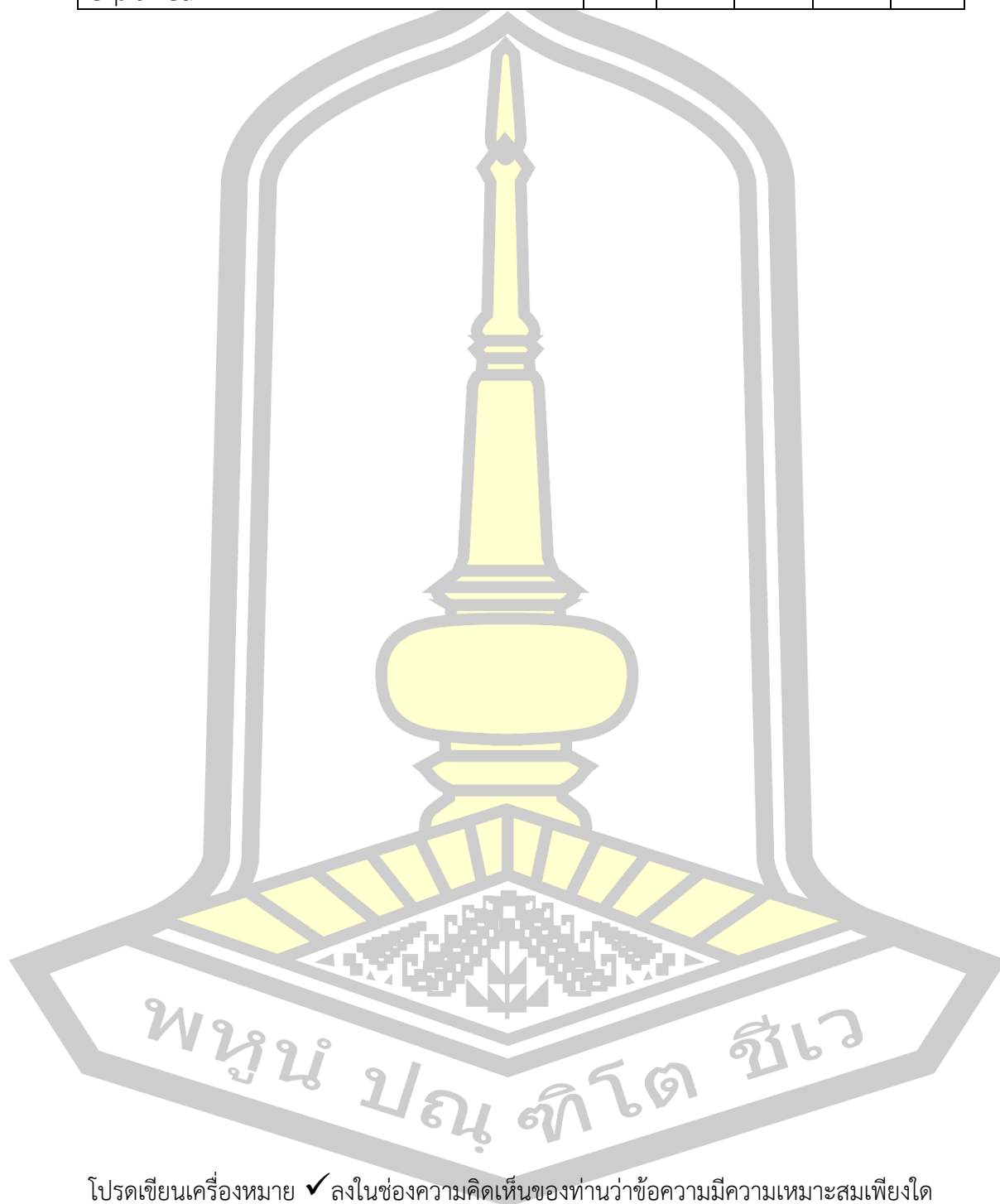
ตอนที่ 2 แบบสอบถามลูกค้าและการใช้ผลิตภัณฑ์อย่างต่อเนื่อง

รายการข้อความ	ระดับความคิดเห็น				
	5	4	3	2	1
	มากที่สุด	มาก	ปานกลาง	น้อย	น้อยที่สุด
<b>6<sup>th</sup> Key Factor: Adherence and Benefits of product</b> ประโยชน์จากผลิตภัณฑ์ที่ลูกค้าได้รับซึ่งมีผลต่อการใช้ผลิตภัณฑ์อย่างต่อเนื่อง					
42. Feel safe using product in long term from its quality assurance.					
43. More adhere from understanding the product benefits stated by healthcare provider.					
44. Positivity to long term adherence use after hearing about its benefits.					
45. Every day usage benefits make you feel adhere long term.					
46. Everyday efficacy seen feel its benefits working improves adherence.					
47. Perceived benefits encourages positivity using the product in long term.					
48. Happy using the product long term with its safety along with modern medications.					



49. More adhere when understood the benefits from processes of manufacturing explained.

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ตอนที่ 3 แบบสอบถามลูกค้าก่อนใช้การใช้เทคโนโลยีสารสนเทศเข้าบริหารกิจกรรมชีวิตประจำวัน

รายการข้อความ	ระดับความคิดเห็น				
	5	4	3	2	1
	มากที่สุด	มาก	ปานกลาง	น้อย	น้อยที่สุด
Daily routine prior IT usage ก่อนใช้เทคโนโลยีสารสนเทศเข้าบริหาร กิจกรรมชีวิตประจำวัน สำหรับลูกค้า					
1. Normally have problems with taking supplements or medication regularly on time.					
2. Use external means such as calendar and/or agenda to keep track of medication.					
3. Forgetful of taking medication or food supplement on a daily basis.					
4. Severity of forgetfulness require you to use calendars or agendas to keep track.					
5. Have conditions that leads to taking multiple medications at the same time.					
6. Current health condition have medicines that may cause forgetfulness.					
7. Have conditions that causes sudden or long-term forgetfulness.					

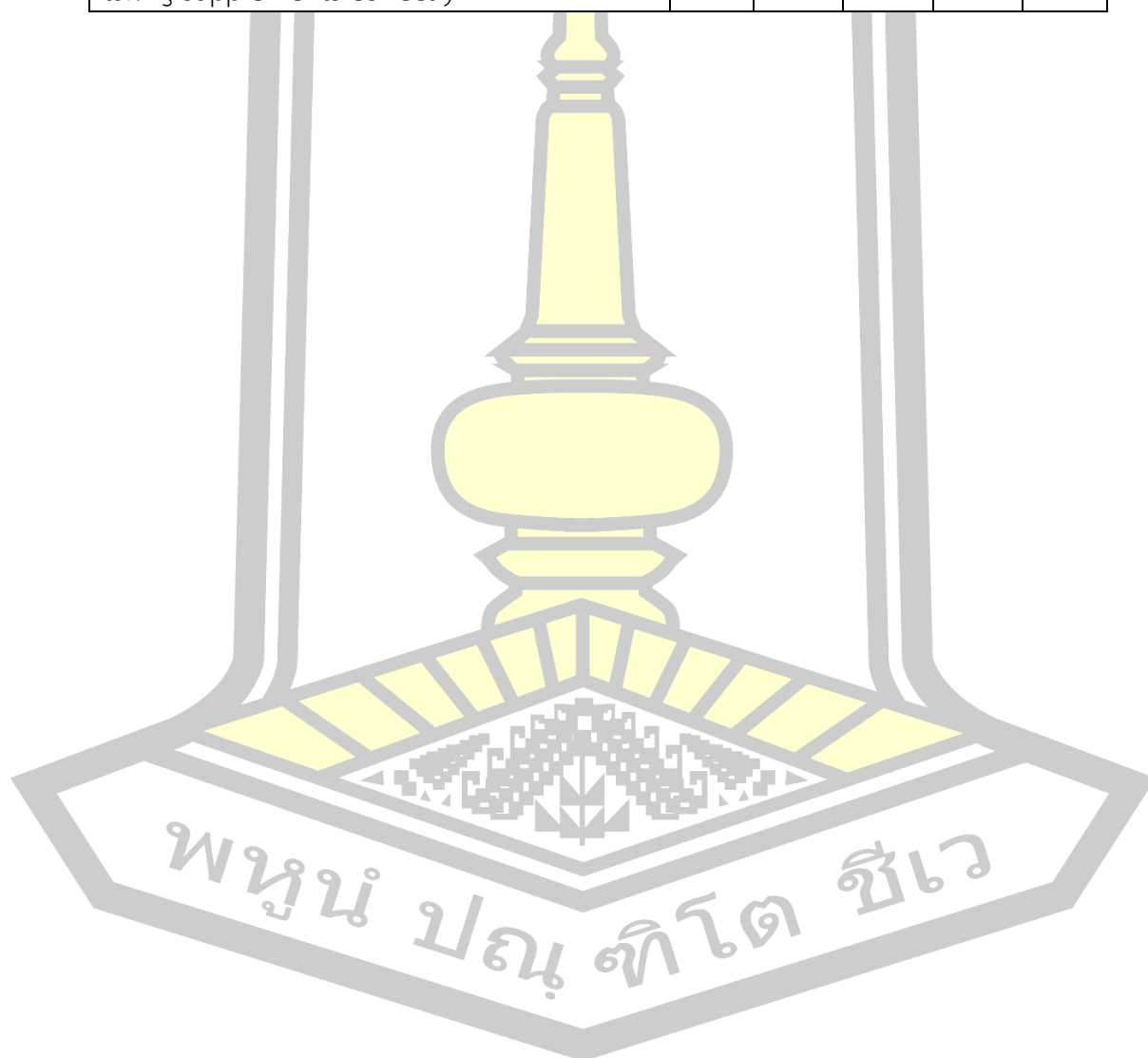


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ตอนที่ 4 แบบสอบถามลูกค้าหลังใช้การใช้เทคโนโลยีสารสนเทศเข้าบริหารกิจกรรมชีวิตประจำวัน

รายการข้อความ	ระดับความคิดเห็น				
	5	4	3	2	1
	มากที่สุด	มาก	ปานกลาง	น้อย	น้อยที่สุด
Daily routine after IT usage หลังใช้การใช้เทคโนโลยีสารสนเทศเข้าบริหาร กิจกรรมชีวิตประจำวัน สำหรับลูกค้า					
1. Feel more convenient keeping track of food supplements taken.					
2. Feel more robust using calendars to web tracking conveniency.					
3. Web tracking helps you to maintain taking supplement regularly.					
4. Web tracking is much convenient for you than calendar and agendas.					

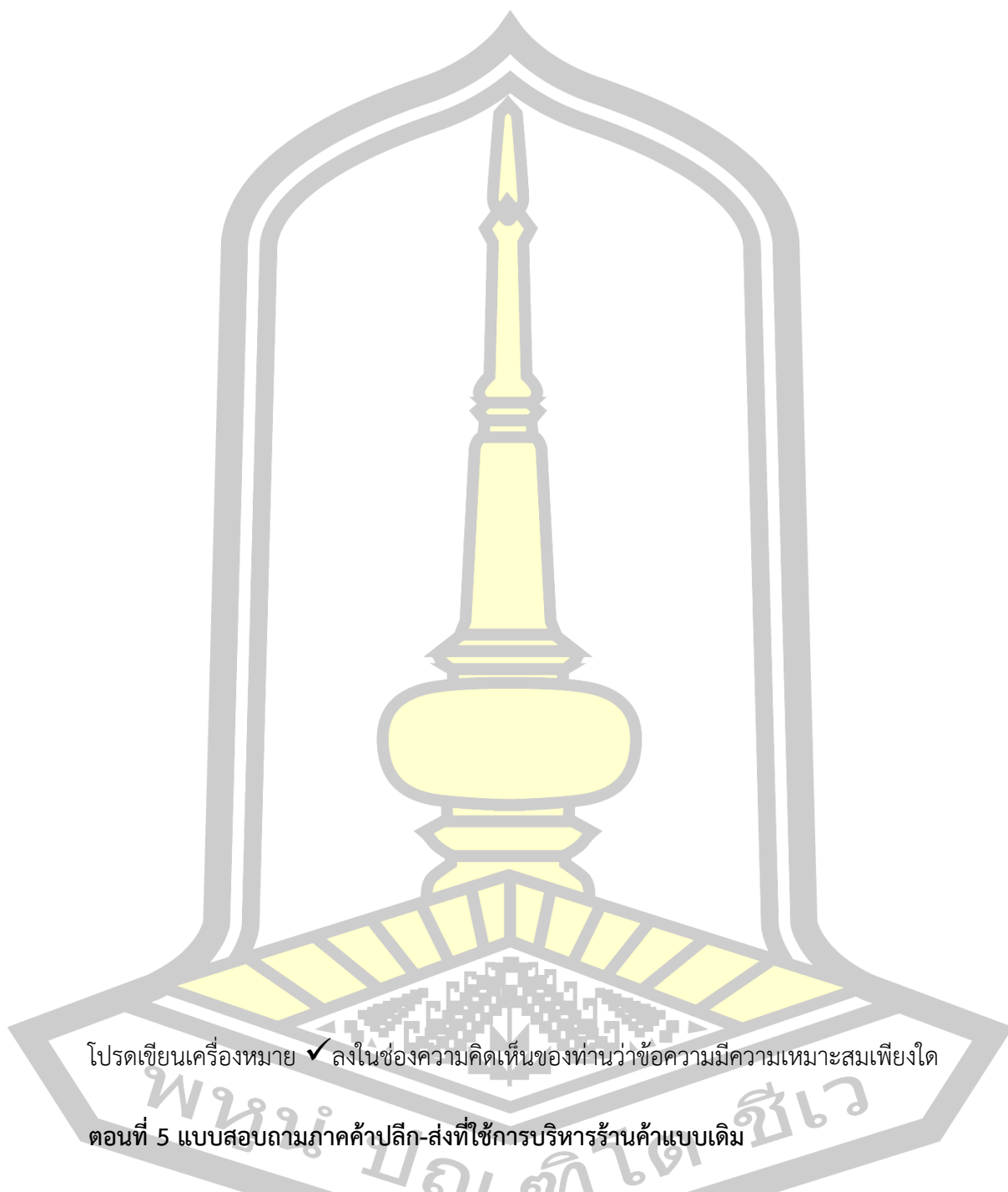
5. Feel more energetic and more cooperative using technological means of adherence devices.					
6. Web tracking can solve your forgetfulness from daily family activities and work.					
7. Technology accessible in one place were able to solve everyday forgetfulness daily intake.					
8. Web tracking allow you to remember taking supplements correctly.					



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ตอนที่ 5 แบบสอบถามภาคค้าปลีก-ส่งที่ใช้การบริหารร้านค้าแบบเดิม

รายการข้อความ	ระดับความคิดเห็น				
	5	4	3	2	1
	มากที่สุด	มาก	ปานกลาง	น้อย	น้อยที่สุด
<b>Retail and Current Retail Management ร้านค้า และการบริหารร้านค้าแบบเดิม</b>					
1. Store manages very well in terms of stocking, re-order, and warehousing on-time.					
2. Current management suffice the operation needed to maintain profitability quarterly.					
3. Store clerk efficiently manage daily routine set by managers, on a daily basis that customer variation throughout the week and month doesn't affect tasks complete.					
4. Store manager can predict and forecast customer demand accurately using current management scheme.					
5. Store network/chain have store promotion that meets customer expectation.					
6. Store clerk provide product information effectively to customers.					
7. Store management meet profit performance after determining regional economy.					
8. Store management meet profitable margin to sustain business on a quarterly basis.					



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ตอนที่ 5 แบบสอบถามภาคคำปลีก-ส่งที่ใช้การบริหารร้านค้าแบบเดิม

รายการข้อความ	ระดับความคิดเห็น				
	5	4	3	2	1
	มากที่สุด	มาก	ปานกลาง	น้อย	น้อยที่สุด
9. Store management able to achieve profit					

performance after determining regional economy and visiting customer power to purchase.					
10. Store met expectations of successful supply chain management.					
11. Store pricing performance makes customer adhere to usage in long term.					
12. Store clerk make sales efficiently so it produces consumer adherence.					
13. Retail stocking/restocking of your store enables product availability to meet customer demand and create consumer adherence.					
14. Store clerk able to promote customer satisfaction that makes customer adhere to product usage.					
15. Store exhibit sales promotion that creates consumer adherence in long term usage.					
16. Store clerk provide enough knowledge viable to create consumer adherence to product usage?					



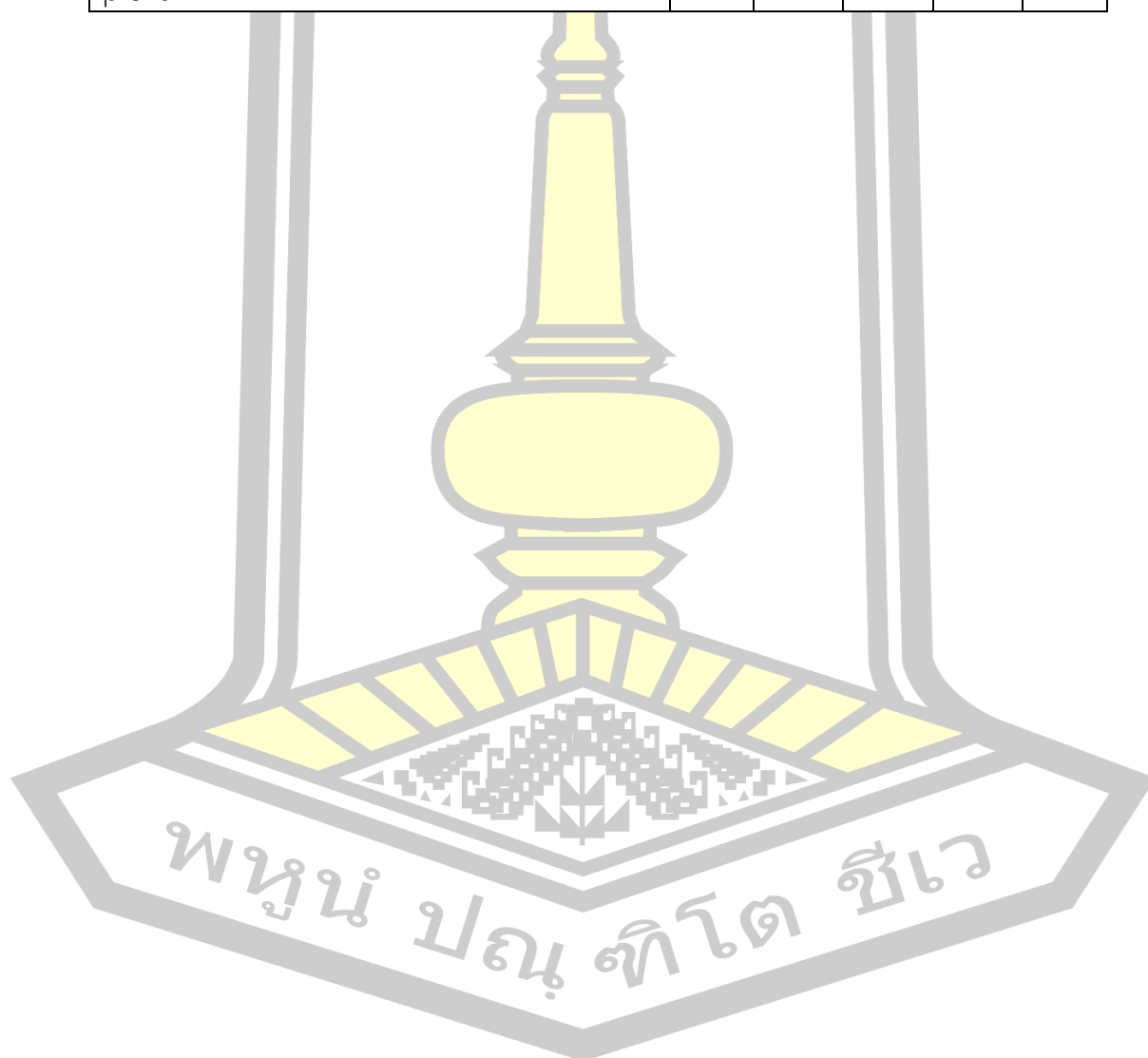
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ตอนที่ 5 แบบสอบถามภาคคำปลีก-ส่งที่ใช้การบริหารร้านค้าแบบเดิม

รายการข้อความ	ระดับความคิดเห็น				
	5	4	3	2	1
	มากที่สุด	มาก	ปานกลาง	น้อย	น้อยที่สุด
17. Retail sale performance able to create consumer adherence usage in long term.					
18. Product stocking efficiency sufficiently met retail sales performance.					
19. Sale performance able to create a sustainable profit performance that can be creditable.					
20. Retail clerk efficient enough to make sales that can become a continuous sale performance and profit performance is visible.					
21. Synchronization will ease store management in information visibility					



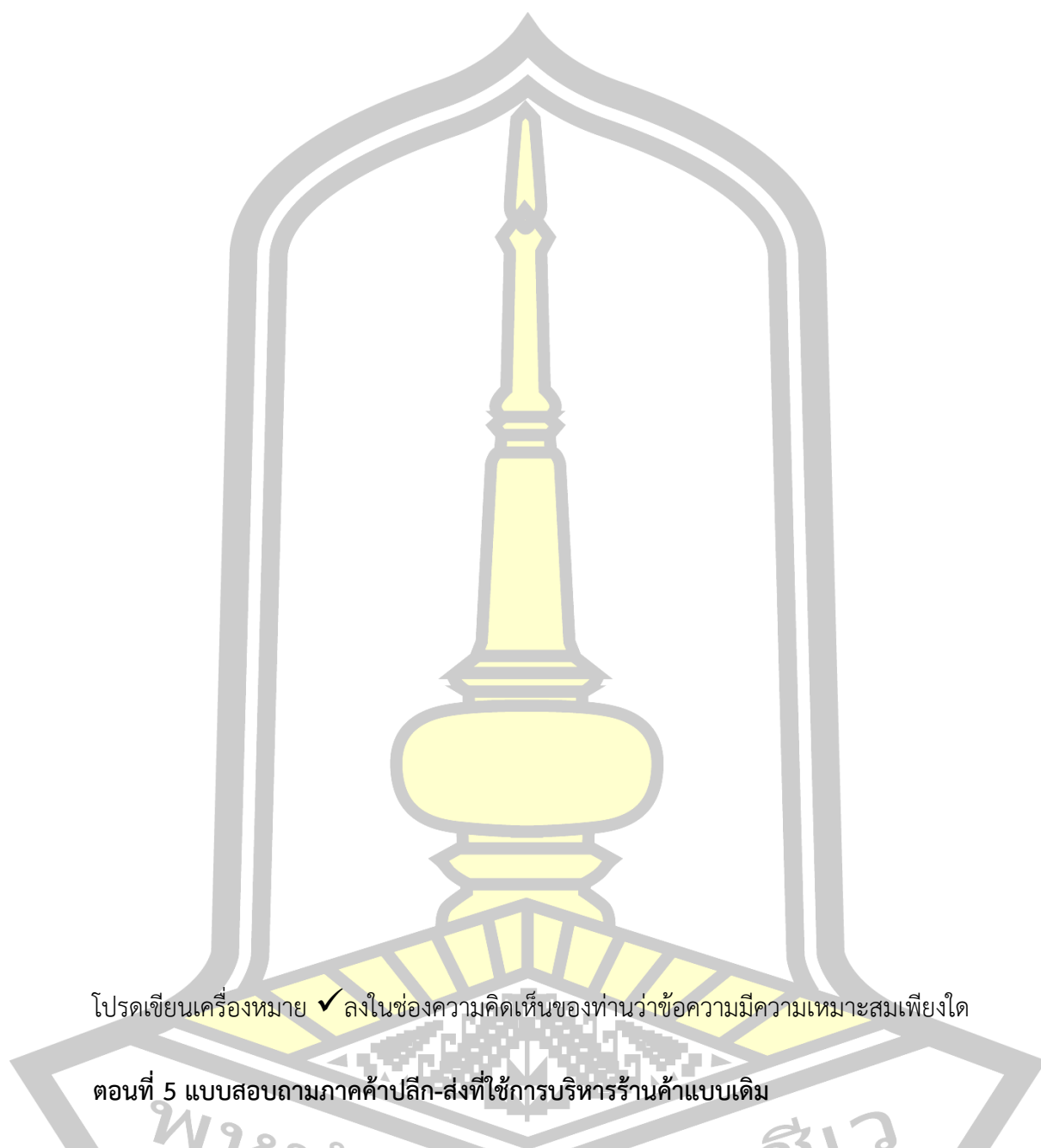
provided by web tracking from customer usage.					
22. Web tracking may solve issue in forecasting order and warehouse management effectively.					
23. Web tracking may solve issue in forecasting sales, profit, and marketing.					
24. Web tracking can help make marketing decision effectively and forecast probable profit.					



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ตอนที่ 5 แบบสอบถามภาคค้าปลีก-ส่งที่ใช้การบริหารร้านค้าแบบเดิม

รายการข้อความ	ระดับความคิดเห็น				
	5	4	3	2	1
	มากที่สุด	มาก	ปานกลาง	น้อย	น้อยที่สุด
25. Based on customer usage and demographic data, web tracking can help relocating items within chain or retail network to reach customer in-need on time.					
26. Web tracking visibility may provide enough information to be integrated into dynamic retail system to formulate data for future decisions.					
27. Web tracking may increase profitability within the time given.					
28. Web tracking may be store essential that can turn customer into digital patronage in the future.					
29. Synchronization method could be more efficient when added to current management.					
30. Synchronization might manage stores very well in terms of stocking, re-order, and warehousing on time. Synchronization may permit all management operation needed to maintain profitability.					



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ตอนที่ 5 แบบสอบถามภาคคำปลีก-ส่งที่ใช้การบริหารร้านค้าแบบเดิม

รายการข้อความ	ระดับความคิดเห็น				
	5	4	3	2	1
	มากที่สุด	มาก	ปานกลาง	น้อย	น้อยที่สุด
31. Synchronization may help store clerk to efficiently manage daily routine set by managers on a daily basis that unaffected by					

customer variation visits throughout the week and month.					
32. Synchronization can ease store manager predict and forecast customer demand accurately, through data visibility.					
33. Synchronization may enable store network/chain to create better promotions that are tailored to meets customer expectation.					
34. Synchronization data visibility may enable store clerk to provide product information effectively to customers.					
35. Synchronization may enable retail management efficiency that creates profit performance to meet expectation point after determining regional economy.					
36. Synchronization may enable store management that met profitable margin to sustain business on a quarterly basis.					

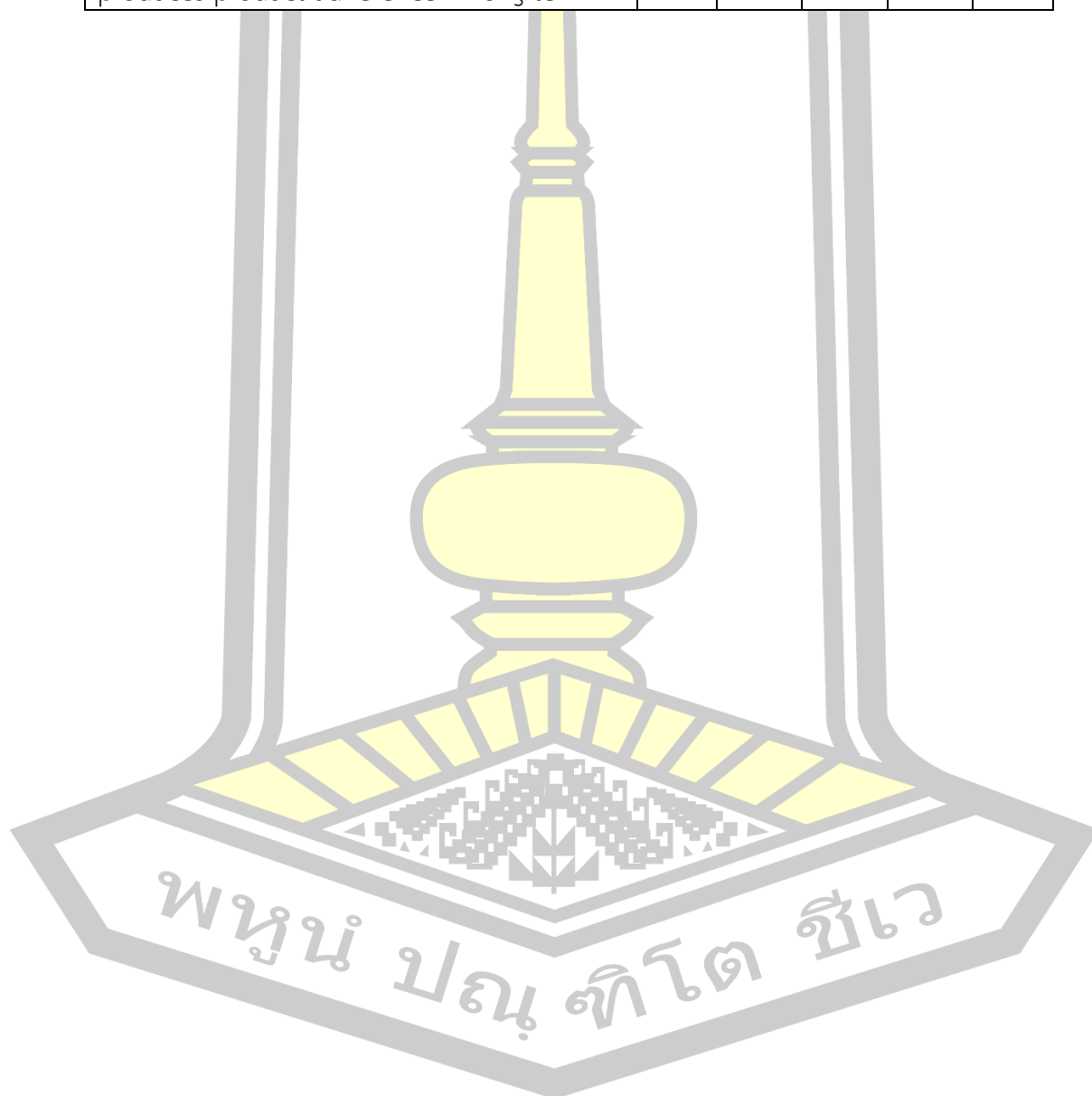


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ตอนที่ 5 แบบสอบถามภาคคำปลีก-ส่งที่ใช้การบริหารร้านค้าแบบเดิม

รายการข้อความ	ระดับความคิดเห็น				
	5	4	3	2	1
	มากที่สุด	มาก	ปานกลาง	น้อย	น้อยที่สุด
37. Synchronization may enable store management to achieve profit performance after determining regional economy and visiting customer purchase power.					
38. Web tracking may enable forecasting demands and manages supply chain effectively.					
39. Web tracking may provide enough information to sustain supply chain management.					
40. Synchronization may help store perform better in pricing performance that creates customer adherence better in long term use.					
41. Synchronization may enable store clerk to make sales efficiently enhancing consumer adherence.					

42. Synchronization may ease retail stocking and re-stocking of items, that enables resilience in product shelf availability to create consumer adherence on a regional scale.					
43. Synchronization may enable store clerk to better promote customer satisfaction that produces product adherence in long term.					



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ตอนที่ 5 แบบสอบถามภาคคำปลีก-ส่งที่ใช้การบริหารร้านค้าแบบเดิม

รายการข้อความ	ระดับความคิดเห็น				
	5	4	3	2	1
	มากที่สุด	มาก	ปานกลาง	น้อย	น้อยที่สุด
44. Synchronization may help make sales promotion better that creates consumer adherence in long term.					
45. Synchronization information visibility may help store clerk to provide enough knowledge viable to create consumer adherence to product usage.					
46. Synchronization may enable retail sale performance to create consumer adherence usage in long term, through a better customer relationship management provided information from consumer visibility.					
47. Synchronization may able to predict and help stock product efficiently well enough to meet retail sales performance status.					
48. Synchronization may enable sale performance that creates a sustainable profit performance that can be knowledgeable credited.					

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ตอนที่ 6 แบบสอบถามภาคค้าปลีก-ส่งหลังใช้การบริหารแบบพร้อมเพรียง โดยใช้เทคโนโลยีสารสนเทศ  
 เข้าเสริมการบริหาร

รายการข้อความ	ระดับความคิดเห็น				
	5	4	3	2	1
	มากที่สุด	มาก	ปานกลาง	น้อย	น้อยที่สุด
Retail and Distributor Synchronization ร้านค้าหลังการบริหารแบบพร้อมเพรียงโดยใช้ เทคโนโลยีสารสนเทศเข้าเสริม					
1. Store manages very well through synchronization in terms of stocking, re-					



order, and warehousing on-time.					
2. Synchronization suffice the visibility for operation needed to maintain profitability quarterly.					
3. Synchronization enables clerk to efficiently finished daily tasks set by managers that customer visits don't affect work quality.					
4. Synchronization helps manager to foresee, predict, and forecast customer demand accurately through better visibility.					
5. Web synchronization provides direct and alternative store promotion choices that meets customer expectation and eases store management.					
6. Synchronization enables store clerk to efficiently provide product information needed for customers.					



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ตอนที่ 6 แบบสอบถามภาคค้าปลีก-ส่งหลังใช้การบริหารแบบพร้อมเพรียง โดยใช้เทคโนโลยีสารสนเทศ  
เข้าเสริมการบริหาร

รายการข้อความ	ระดับความคิดเห็น				
	5	4	3	2	1
	มากที่สุด	มาก	ปานกลาง	น้อย	น้อยที่สุด
7. Synchronization helps manage store sales that meet profit performance after determining users in regional economy.					
8. Synchronization helped managers met profitable margin to sustain business on a quarterly basis.					
9. Retail synchronization able to achieve profit performance after analyzing regional economy and regional customer power to purchase.					
10. Retail synchronization effectively met expectations of successful supply chain management. Retail synchronization enables pricing performance that makes customer adhere long term.					

11. Retail synchronization creates efficient sales that produces consumer adherence.					
12. Retail synchronization eases stocking/restocking tasks, enabling resilience in product availability to meet customer demand and create consumer adherence.					



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ตอนที่ 6 แบบสอบถามภาคค้าปลีก-ส่งหลังใช้การบริหารแบบพร้อมเพรียง โดยใช้เทคโนโลยีสารสนเทศ

เข้าเสริมการบริหาร

รายการข้อความ	ระดับความคิดเห็น				
	5	4	3	2	1
	มากที่สุด	มาก	ปานกลาง	น้อย	น้อยที่สุด
13. Synchronization enables visibility to store clerk to promote customer satisfaction that makes customer adhere to product usage.					
14. Synchronization eases sales promotion that creates consumer adherence in long term usage.					
15. Synchronization visibility help store clerk in providing enough knowledge viable to create consumer adherence to product usage.					
16. Retail synchronization enables sale performance that create consumer adherence in long term.					
17. Synchronization leads to better product stocking efficiency that sufficiently met retail sales performance.					
18. Retail synchronization exhibit sale performance that enables visible and creditable sustainable profit performance.					
19. Retail clerk efficient enough to make sales that can become a continuous sale performance and profit performance is visible.					

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ตอนที่ 6 แบบสอบถามภาคคำปลีก-ส่งหลังใช้การบริหารแบบพร้อมเพียง โดยใช้เทคโนโลยีสารสนเทศ  
เข้าเสริมการบริหาร

รายการข้อความ	ระดับความคิดเห็น				
	5	4	3	2	1
	มากที่สุด	มาก	ปานกลาง	น้อย	น้อยที่สุด
20. Store management is easier through synchronization information visibility provided by web tracking from customer					

usage.					
21. Web tracking solve your issue in forecasting order and warehouse management effectively.					
22. Web tracking solve your issue in forecasting sales, profit, and marketing.					
23. Web tracking help you make marketing decision effectively and forecast probable profit.					
24. Based on customer usage and demographic data, web tracking allows you to relocate product within your chain or retail network to reach customer in-need on time.					
25. Web tracking visibility provides enough information to be integrated into dynamic retail system to formulate data for future decisions.					
26. Web tracking increase your profitability within the time given.					

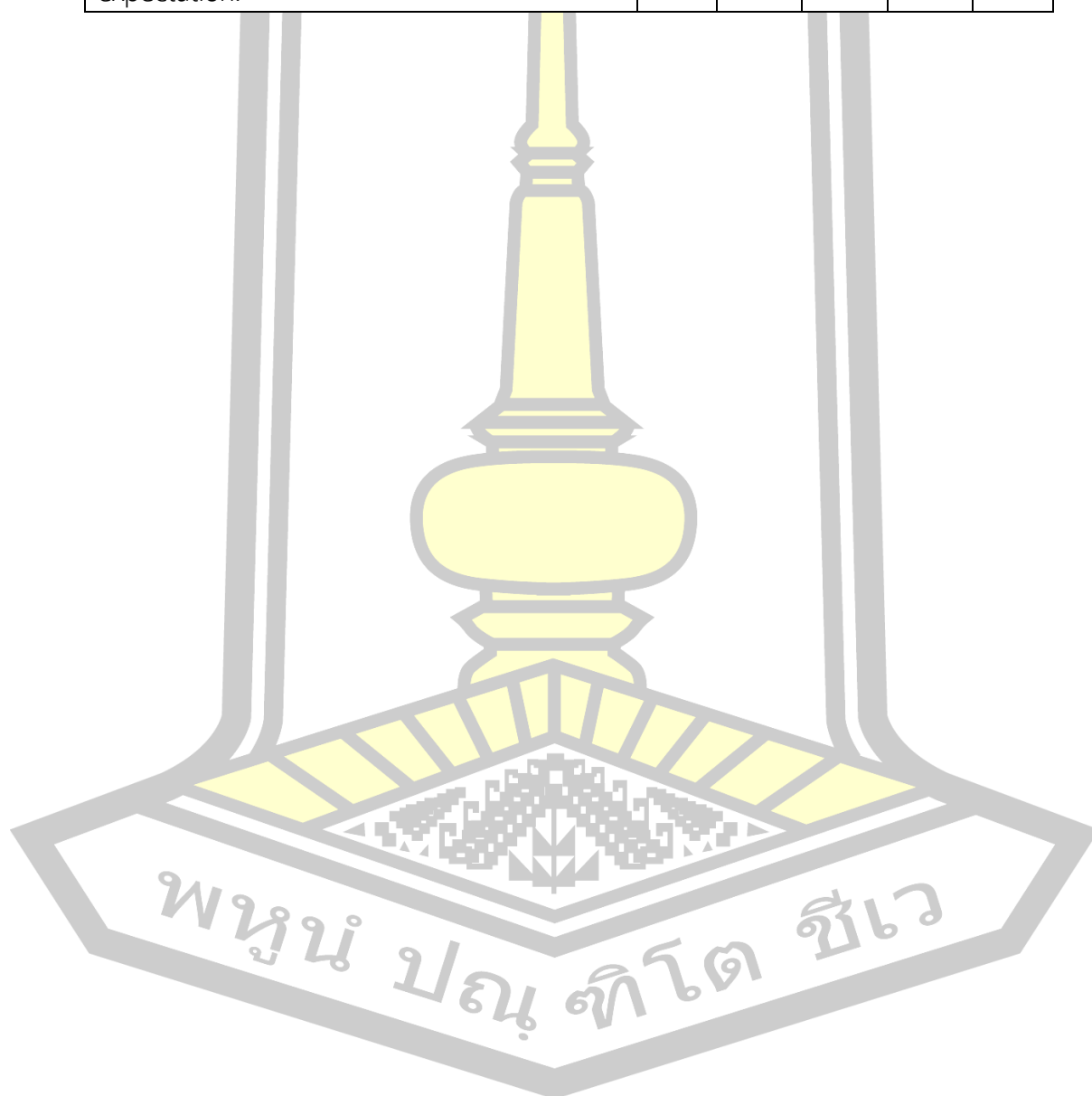


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ตอนที่ 6 แบบสอบถามภาคค้าปลีก-ส่งหลังใช้การบริหารแบบพร้อมเพรียง โดยใช้เทคโนโลยีสารสนเทศ  
 เข้าเสริมการบริหาร

รายการข้อความ	ระดับความคิดเห็น				
	5	4	3	2	1
	มากที่สุด	มาก	ปานกลาง	น้อย	น้อยที่สุด
27. Web tracking is to be store essential that can turn customer into digital patronage in the future.					
28. Synchronization method is more efficient added to current management.					
29. Synchronization manage stores very well in terms of stocking, re-order, and warehousing on time.					
30. Synchronization permits all management operation needed to maintain profitability.					
31. Synchronization enables store clerk to efficiently manage daily routine set by managers on a daily basis that unaffected by customer variation visits throughout the					

week and month?					
32. Synchronization eases store manager predict and forecast customer demand accurately, through data visibility.					
33. Synchronization enables store network/chain to create better promotions that are tailored to meets customer expectation.					

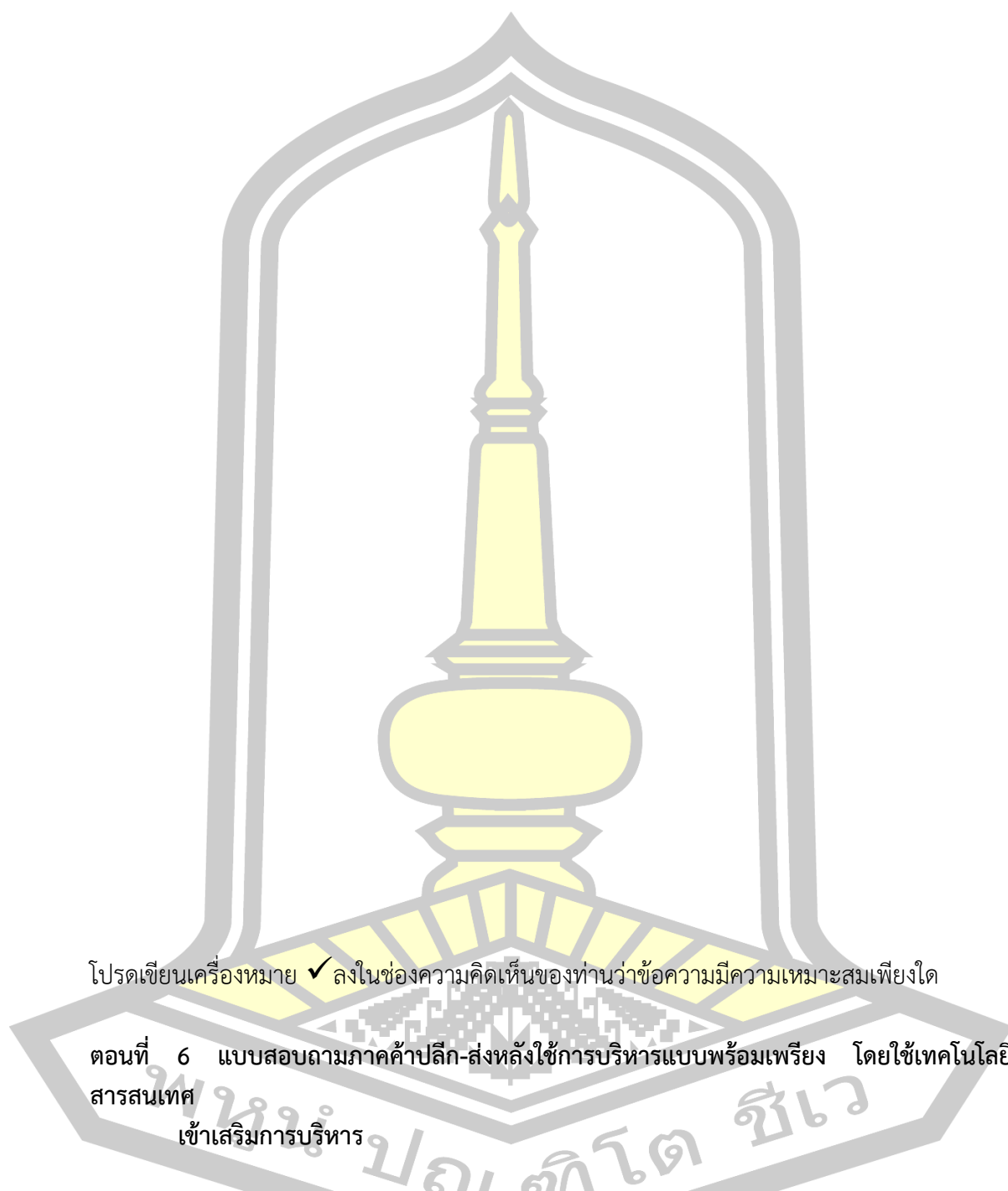




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ตอนที่ 6 แบบสอบถามภาคค้าปลีก-ส่งหลังใช้การบริหารแบบพร้อมเพรียง โดยใช้เทคโนโลยีสารสนเทศ  
 เข้าเสริมการบริหาร

รายการข้อความ	ระดับความคิดเห็น				
	5	4	3	2	1
	มากที่สุด	มาก	ปานกลาง	น้อย	น้อยที่สุด
34. Synchronization data visibility enables store clerk to provide product information effectively to customers.					
35. Synchronization enables retail management efficiency that creates profit performance to meet expectation point after determining regional economy.					
36. Synchronization enables store management that met profitable margin to sustain business on a quarterly basis.					
37. Synchronization enables store management to achieve profit performance after determining regional economy and visiting customer purchase power.					
38. Web tracking enables to forecast demands and manages supply chain effectively.					
39. Web tracking provides enough information to sustain supply chain management.					
40. Synchronization lets store perform better in pricing performance that creates customer adherence better in long term use.					



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ตอนที่ 6 แบบสอบถามภาคคำปลีก-ส่งหลังใช้การบริหารแบบพร้อมเพรียง โดยใช้เทคโนโลยีสารสนเทศ  
เข้าสู่ระบบการบริหาร

	ระดับความคิดเห็น				
	5	4	3	2	1
รายการข้อความ	มากที่สุด	มาก	ปานกลาง	น้อย	น้อยที่สุด
41. Synchronization enables store clerk to					

make sales efficiently enhancing consumer adherence.					
42. Synchronization eases retail stocking and restocking of your retail that enables resilience in product shelf availability to create consumer adherence on a regional scale.					
43. Synchronization enables store clerk to better promote customer satisfaction that produces product adherence in long term.					
44. Synchronization help make sales promotion better that creates consumer adherence in long term.					
45. Synchronization information visibility help store clerk to provide enough knowledge viable to create consumer adherence to product usage.					
46. Synchronization enables retail sale performance to create consumer adherence usage in long term, through a better customer relationship management provided information from consumer visibility.					



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ตอนที่ 6 แบบสอบถามภาคค้าปลีก-ส่งหลังใช้การบริหารแบบพร้อมเพรียง โดยใช้เทคโนโลยีสารสนเทศ  
 เข้าเสริมการบริหาร

รายการข้อความ	ระดับความคิดเห็น				
	5	4	3	2	1
	มากที่สุด	มาก	ปานกลาง	น้อย	น้อยที่สุด
47. Synchronization able to predict and help stock product efficiently well enough to meet retail sales performance status.					
48. Synchronization enables sale performance that creates a sustainable profit performance that can be knowledgeably credited.					

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ตอนที่ 7 แบบสอบถามภาคอุตสาหกรรมและการบริหารการผลิตแบบเดิม

	ระดับความคิดเห็น				
	5	4	3	2	1
รายการข้อความ	มากที่สุด	มาก	ปานกลาง	น้อย	น้อยที่สุด
Manufacturer and Current Manufacturing Scheme โรงงานและการบริหารการผลิตแบบเดิม					
1. Current manufacturing operation met retails and distributors demand on time.					
2. Communication performed well with					

information from retailer and distributor.					
3. Marketing personnel were effective at completing tasks to meet demand and product marketability.					
4. Operation managers were able to complete production on time without machine and power failure.					
5. Purchasing manager able to forecast re-purchase amount effectively and secure raw material supply chain in marketing decisions planning.					
6. Manufacturing performance meets product market growth demand on a quarterly basis.					
7. Manufacturing efficiency meet profit performance in current and future profitability in an untapped market.					
8. Manufacturing operation meet profit efficiency enough to sustain business.					



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ตอนที่ 7 แบบสอบถามภาคอุตสาหกรรมและการบริหารการผลิตแบบเดิม

รายการข้อความ	ระดับความคิดเห็น				
	5	4	3	2	1
	มากที่สุด	มาก	ปานกลาง	น้อย	น้อยที่สุด
9. Warehouse stocking were able to meet new customer increase demand of product while its market increase during product life cycle.					
10. Warehouse efficiently perform its task of delivering product in-time for customers before its sales.					
11. Existing pre-plans can compensate for disruption, manufacturing downtime, and re-initiating manufacture operation if minimal disruption occurs.					
12. Store sales re-order for stocking efficiently produces strategic production planning and scheme for the monthly, bi-monthly, or quarterly plan.					
13. Retailer and distributor able to make a					

good deal of order to make an efficient production operation that save costs; time, machine, human resources, and money.					
14. Retail stocking of retailer and distributor efficiently enough to produce a well-planned strategic for manufacturing warehouse efficiency					





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ตอนที่ 7 แบบสอบถามภาคอุตสาหกรรมและการบริหารการผลิตแบบเดิม

รายการข้อความ	ระดับความคิดเห็น				
	5	4	3	2	1
	มากที่สุด	มาก	ปานกลาง	น้อย	น้อยที่สุด
15. Retail stocking of retailer and distributor efficiently enough to produce an efficient operation for delivering outstanding warehouse tasks.					
16. Manufacturing operation strategy efficient enough to make sustainable supply chain in raw materials needed.					
17. Manufacturing performance efficient enough to create profit performance while consumer demands are on the rise.					
18. Manufacturing operation efficient enough to create a profit performance when market promotion plans are effective and consumer demands expands exceedingly.					
19. Order fulfillment from retailer and distributor enables efficient budget expense on operations routinely performed.					
20. Order fulfillment from retailer and distributor efficiently creates logistic strategy that saves manufacturer's operation costs.					
21. Order fulfillment from retailer and distributor efficiently creates logistic operation that is budget wise and save logistic operation costs.					

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ตอนที่ 7 แบบสอบถามภาคอุตสาหกรรมและการบริหารการผลิตแบบเดิม

รายการข้อความ	ระดับความคิดเห็น				
	5	4	3	2	1
	มากที่สุด	มาก	ปานกลาง	น้อย	น้อยที่สุด
22. Manufacturing management may ease through using visibility provided by web tracking from customer usage.					

23. Web tracking may solve issues in warehouse forecasting retail re-order for re-stocking efficiently.					
24. Web tracking may solve issues in warehouse re-ordering for manufacturing effectively.					
25. Web tracking may solve problems in raw material supply chain sustainability during high demand period, product booming period from market success, and increase demands as demographic population data increase.					
26. Web tracking may provide enough data for managing multiple operations within departments of manufacture; marketing, manufacturing, and purchasing.					
27. Synchronization may help current manufacturing operation meet retails and distributors demand on time.					
28. Synchronization may perform well with information from retailer and distributor.					

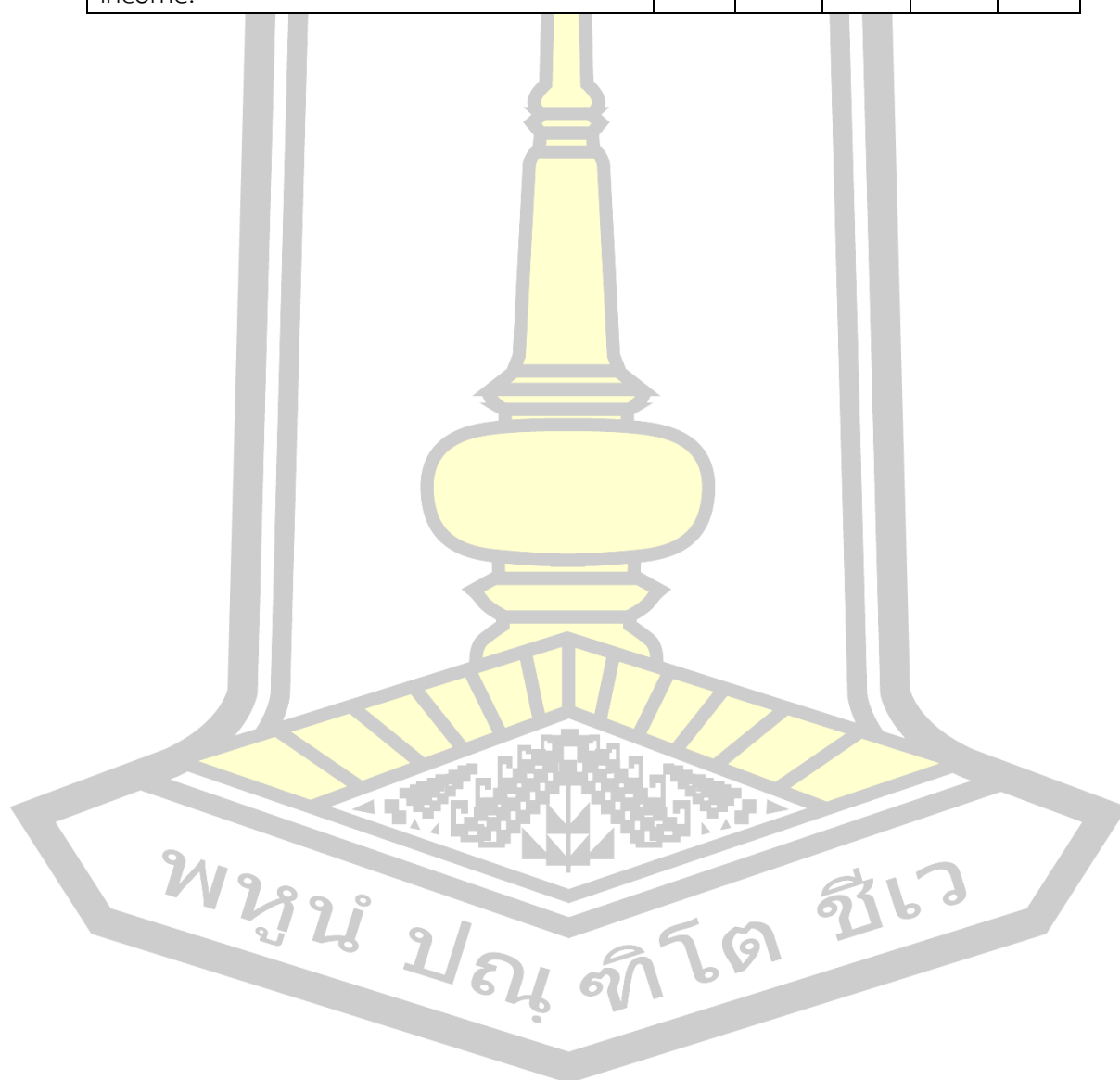


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ตอนที่ 7 แบบสอบถามภาคอุตสาหกรรมและการบริหารการผลิตแบบเดิม

รายการข้อความ	ระดับความคิดเห็น				
	5	4	3	2	1
	มากที่สุด	มาก	ปานกลาง	น้อย	น้อยที่สุด
29. Synchronization may help your marketing personnel effective at completing tasks to meet product marketability.					
30. Synchronization may help operation managers better to make production on time without machine or human resource disruption.					
31. Synchronization may help purchasing manager able to forecast re-purchase amount effectively and secure raw material supply chain; throughout marketing decisions planning.					
32. Synchronization may help manufacturing performance meets product market growth					

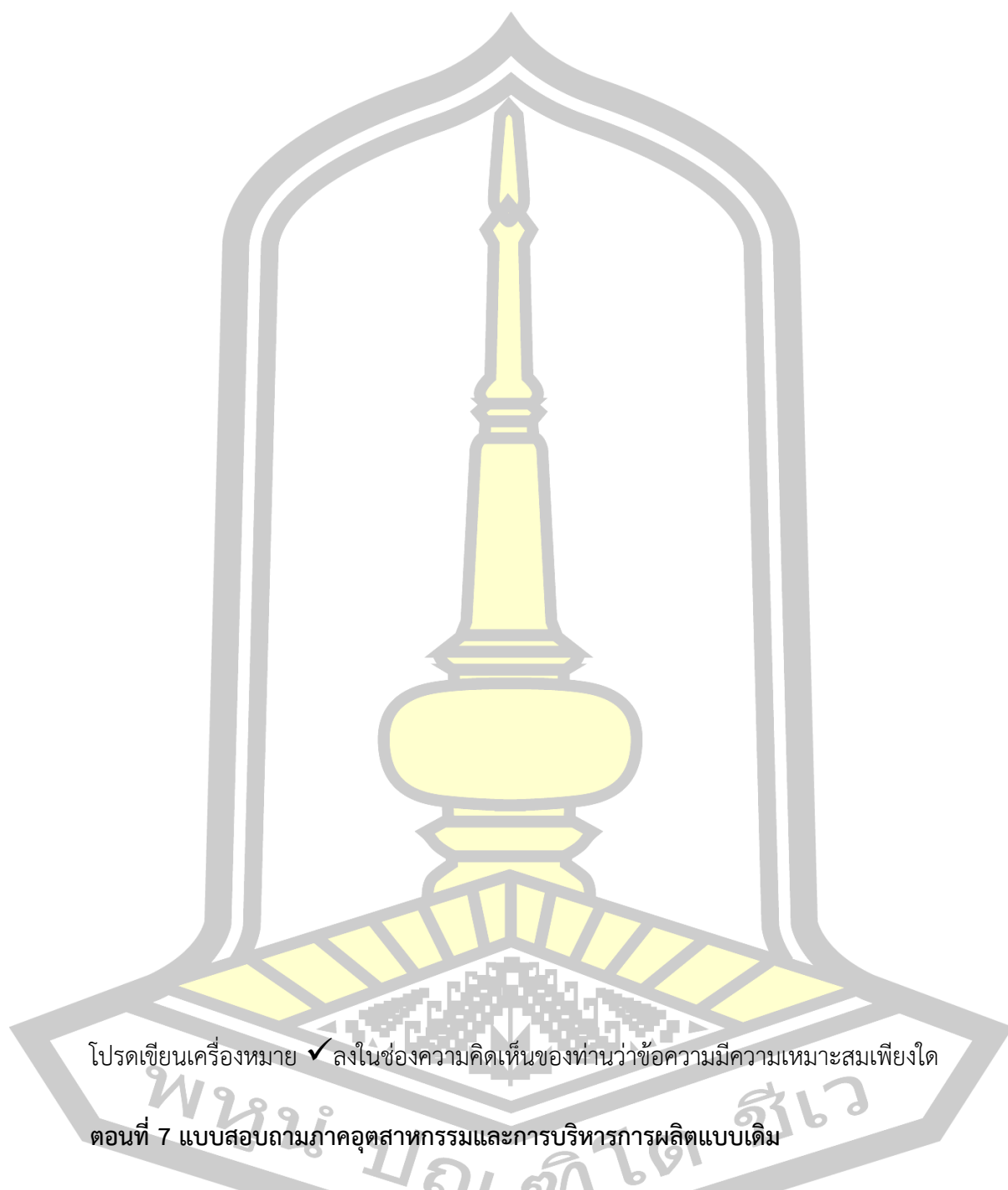
demand on a quarterly basis.					
33. Synchronize data may create manufacturing efficiency meet profit performance in current and an untapped market.					
34. Management through synchronize data may help manufacturing operation met profit efficiency enough to sustain business income.					



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ตอนที่ 7 แบบสอบถามภาคอุตสาหกรรมและการบริหารการผลิตแบบเดิม

รายการข้อความ	ระดับความคิดเห็น				
	5	4	3	2	1
	มากที่สุด	มาก	ปานกลาง	น้อย	น้อยที่สุด
35. Synchronization may help warehouse stocking in terms of meeting new customer increase demand of product while its market increase during product life cycle after every operation is synchronized.					
36. Synchronized warehouse may enable operations efficiently performs its task of delivering product in-time and forecast customers demand before sales.					
37. Synchronized data may enable managers to formulate pre-plans to compensate for disruption, manufacturing downtime, and re-initiating manufacture operation if minimal disruption occurs.					
38. Synchronization may enable store sales and re-order for stockings that efficiently produces strategic production planning and scheme for the monthly, bi-monthly, or quarterly plan.					
39. Synchronization with retailer/distributor may enable managers to make a good amount of order to make an efficient production operation that save costs; time, machine, human resources, and money.					



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ตอนที่ 7 แบบสอบถามภาคอุตสาหกรรมและการบริหารการผลิตแบบเดิม

	ระดับความคิดเห็น				
	5	4	3	2	1
รายการข้อความ	มากที่สุด	มาก	ปานกลาง	น้อย	น้อยที่สุด
40. Managers may enable to make a well-					

planned strategies through synchronized data that were able to run manufacturing warehouse efficiently in terms of managing stocking and re-stocking of retailer/distributor efficiently.					
41. Retail stocking of retailer/distributor would be efficiently enough to produce an efficient operation for delivering outstanding warehouse tasks if data were visibly synchronized.					
42. Synchronized data may enable manufacturing operation strategy efficiently enough to create sustainable supply chain in raw materials sectors when in needed.					
43. Synchronization may help create efficiency in manufacturing performance that were enough to create profit performance while consumer demands are on the rise, through product-quality-propelled or market- promotion-propelled?					





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ตอนที่ 7 แบบสอบถามภาคอุตสาหกรรมและการบริหารการผลิตแบบเดิม

รายการข้อความ	ระดับความคิดเห็น				
	5	4	3	2	1
	มากที่สุด	มาก	ปานกลาง	น้อย	น้อยที่สุด
44. Synchronization may increase manufacturing operation efficiency enough to create a profit performance when market promotion plans are effective with consumer demands expands exceedingly.					
45. While synchronized, order fulfillments from retailer and distributor may enables efficient budget expense on operations routinely performed.					
46. Synchronization data involving order fulfillment from retailer and distributor may efficiently create logistic strategy that saves manufacturer's operation costs.					
47. Synchronized data on order fulfillments from retailer and distributor efficiently may					

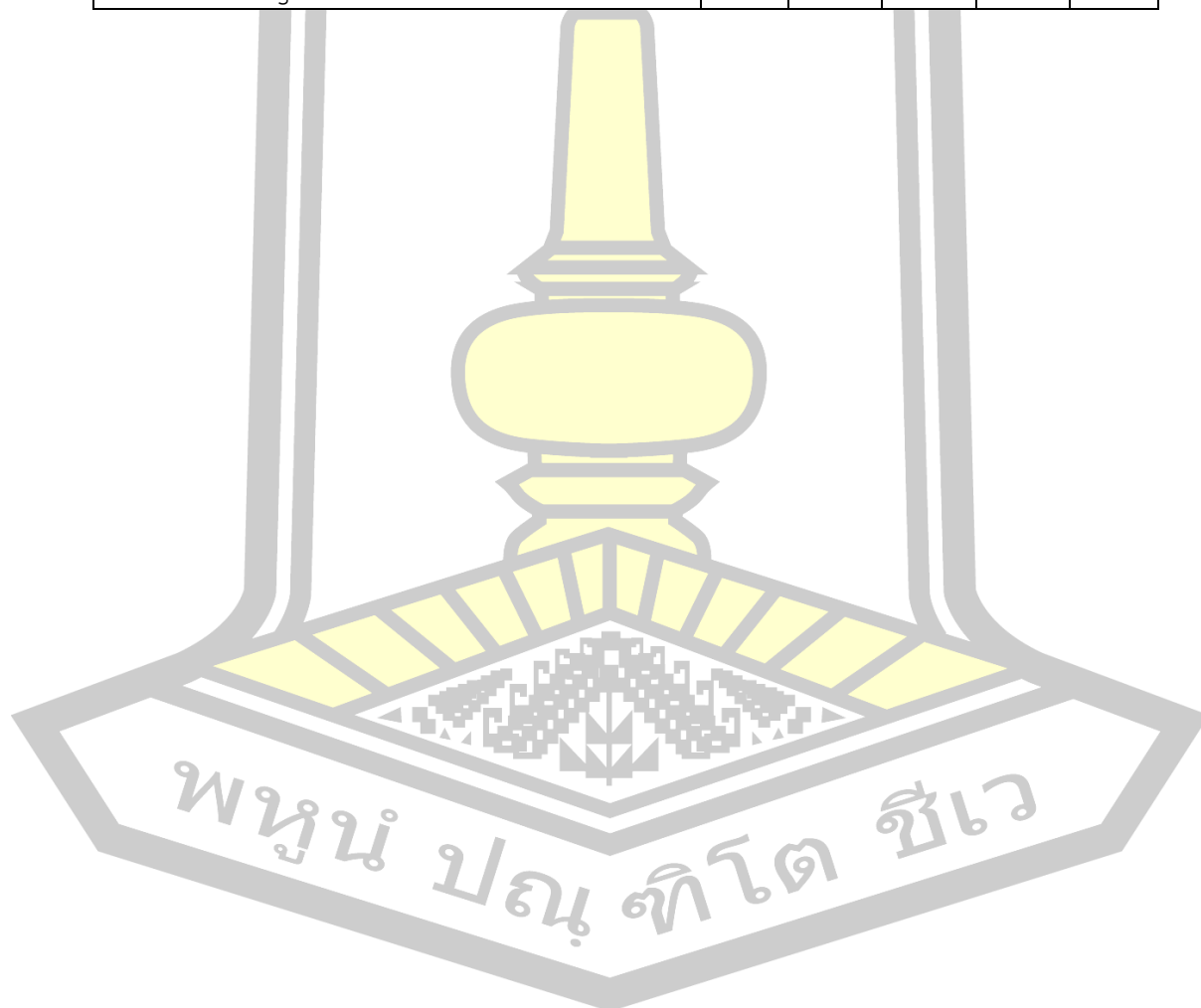
create logistic operation that is budget wise and save logistic operation costs.					
48. Synchronization may save manufacturing budget and increase pool cash for raw material purchase that can increase future income from manufacturing.					



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ตอนที่ 7 แบบสอบถามภาคอุตสาหกรรมและการบริหารการผลิตแบบเดิม

รายการข้อความ	ระดับความคิดเห็น				
	5	4	3	2	1
	มากที่สุด	มาก	ปานกลาง	น้อย	น้อยที่สุด
49. Synchronization may help forecast demand incongruence with market plans that can forecast future demand, therefore forecasting probable income in future manufacturing.					

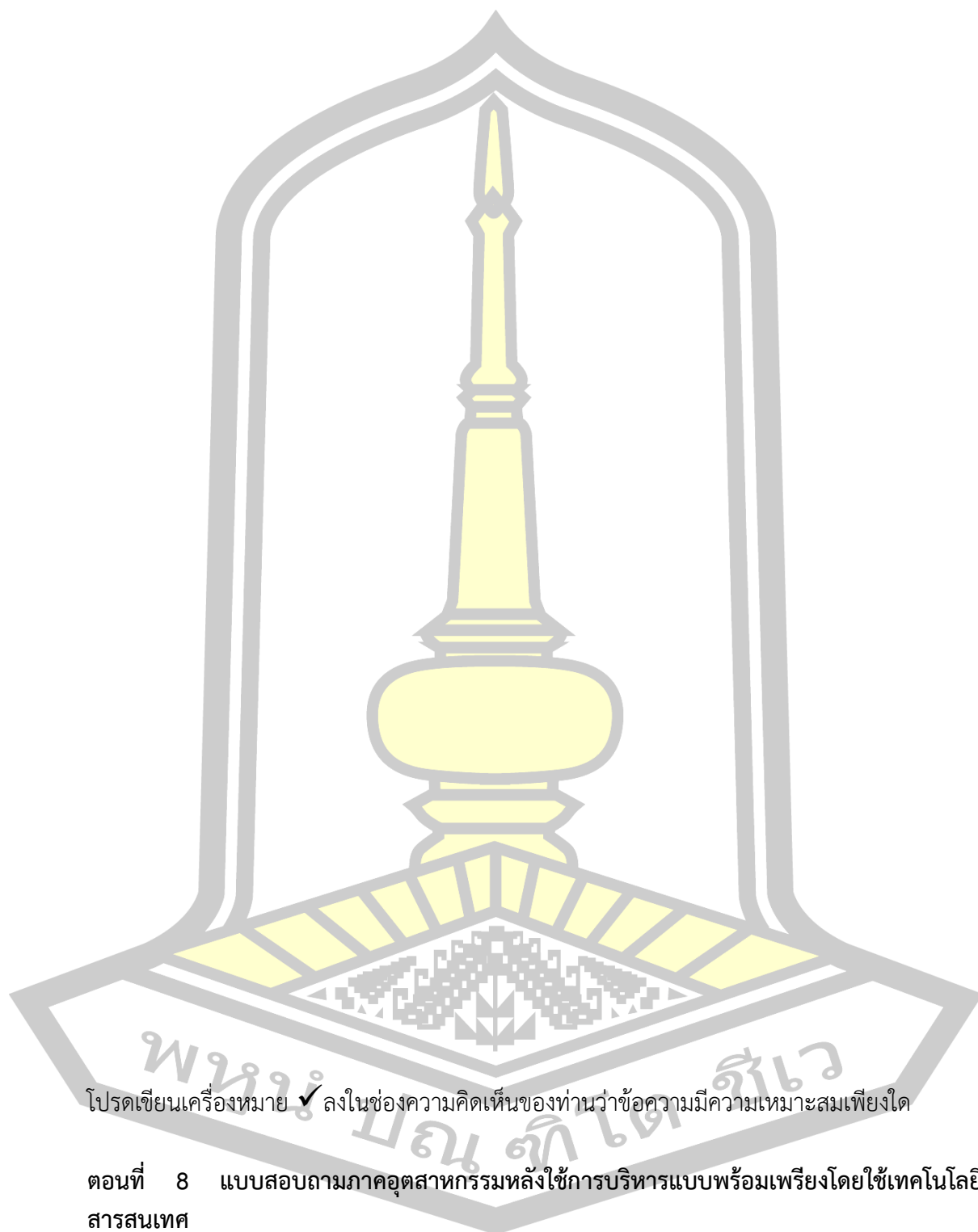


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ตอนที่ 8 แบบสอบถามภาคอุตสาหกรรมหลังใช้การบริหารแบบพร้อมเพรียงโดยใช้เทคโนโลยีสารสนเทศ  
 เข้าเสริมการบริหาร

รายการข้อความ	ระดับความคิดเห็น				
	5	4	3	2	1
	มากที่สุด	มาก	ปานกลาง	น้อย	น้อยที่สุด
<b>Manufacturer and Synchronization Management</b> โรงงานหลังใช้การบริหารแบบพร้อมเพรียงโดยใช้เทคโนโลยีสารสนเทศเข้าเสริม					
1. Manufacturing management is easier using visibility provided by web tracking from customer usage.					
2. Web tracking solved issue in warehouse forecasting retail re-order for re-stocking efficiently.					
3. Web tracking solved issue in warehouse re-ordering for manufacturing effectively.					
4. Web tracking solve problems in raw material supply chain sustainability during high demand period, product booming period from market success, and increase demands as demographic population data increase.					
5. Web tracking provide enough data for managing multiple operations within departments of manufacture; marketing,					

manufacturing, and purchasing.					
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ตอนที่ 8 แบบสอบถามภาคอุตสาหกรรมหลังใช้การบริหารแบบพร้อมเพรียงโดยใช้เทคโนโลยีสารสนเทศ

เข้าเสริมการบริหาร

	ระดับความคิดเห็น
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รายการข้อความ	5	4	3	2	1
	มากที่สุด	มาก	ปานกลาง	น้อย	น้อยที่สุด
6. Synchronization helps current manufacturing operation meet retailers and distributors demand on time.					
7. Synchronization perform well with information from retailer and distributor.					
8. Synchronization helps marketing personnel more effective at completing tasks to meet product marketability.					
9. Synchronization enabled operation managers to make production on time without machine or human resource disruption.					
10. Synchronization, was purchasing manager able to forecast re-purchase amount effectively and secure raw material supply chain; throughout marketing decisions planning.					
11. Synchronization enabled manufacturing performance meets product market growth demand on a quarterly basis.					
12. Synchronize data enabled manufacturing efficiency meet profit performance in current and an untapped market.					



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ตอนที่ 8 แบบสอบถามภาคอุตสาหกรรมหลังใช้การบริหารแบบพร้อมเพรียงโดยใช้เทคโนโลยีสารสนเทศ  
 เข้าเสริมการบริหาร

รายการข้อความ	ระดับความคิดเห็น				
	5	4	3	2	1
	มากที่สุด	มาก	ปานกลาง	น้อย	น้อยที่สุด
13. Management through synchronize data help manufacturing operation met profit efficiency enough to sustain business income.					
14. Warehouse stocking able to meet new customer increase demand of product while its market increase during product life cycle after every operation is synchronized.					

15. Synchronized warehouse efficiently performs its task of delivering product in-time and forecast customers demand before sales.					
16. Synchronized data enables managers to formulate pre-plans to compensate for disruption, manufacturing downtime, and re-initiating manufacture operation if minimal disruption occurs.					
17. Synchronization store sales and re-order for stocking efficiently produces strategic production planning and scheme for the monthly, bi-monthly, or quarterly plan.					

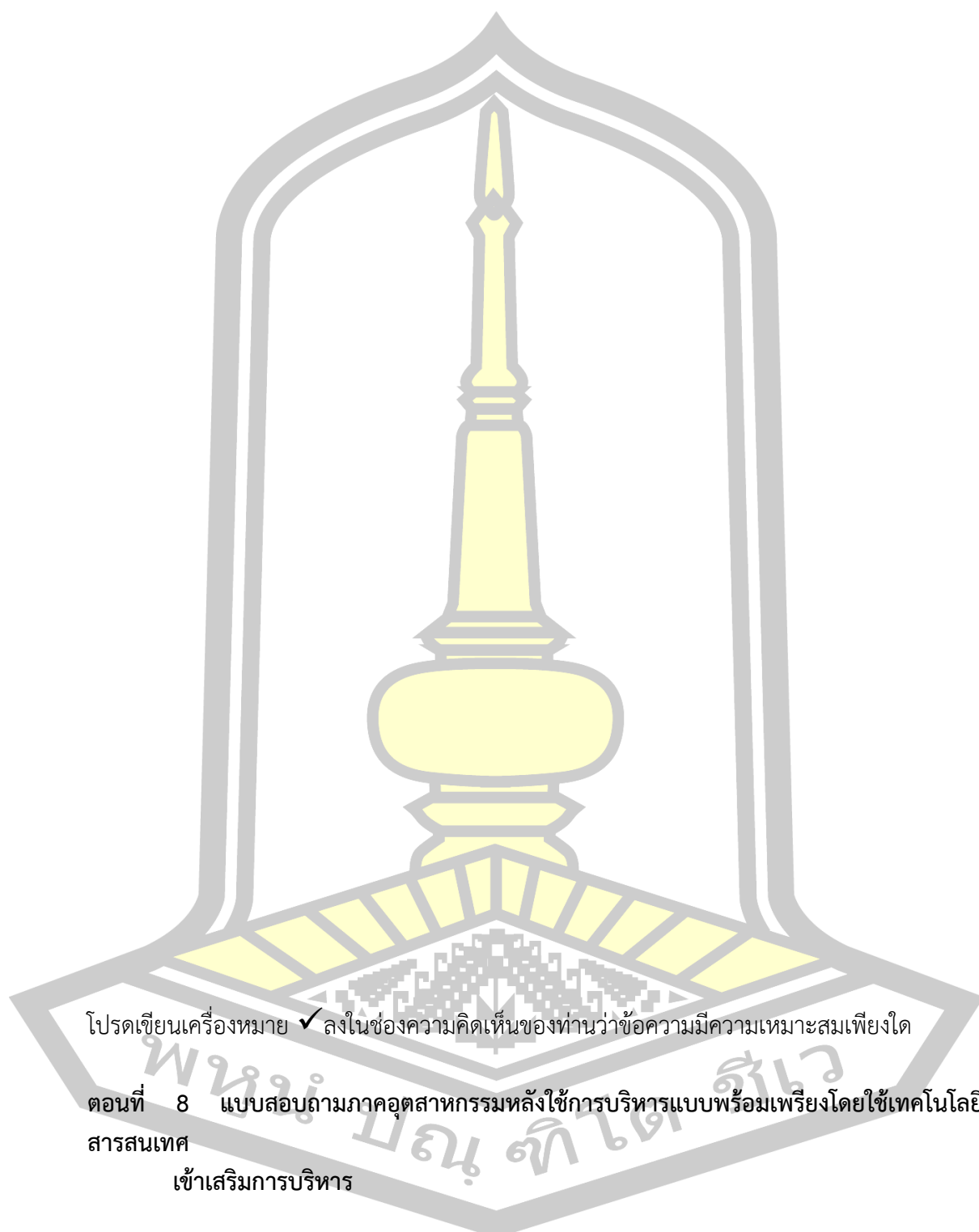




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ตอนที่ 8 แบบสอบถามภาคอุตสาหกรรมหลังใช้การบริหารแบบพร้อมเพรียงโดยใช้เทคโนโลยีสารสนเทศ  
 เข้าเสริมการบริหาร

รายการข้อความ	ระดับความคิดเห็น				
	5	4	3	2	1
	มากที่สุด	มาก	ปานกลาง	น้อย	น้อยที่สุด
18. Synchronization with retailer/distributor enabled managers to make a good amount of order to make an efficient production operation that save costs; time, machine, human resources, and money.					
19. Managers were able to make a well-planned strategies through synchronized data that were able to run manufacturing warehouse efficiently in terms of managing stocking and re-stocking of retailer/distributor efficiently.					
20. Retail stocking of retailer/distributor were efficiently enough to produce an efficient operation for delivering outstanding warehouse tasks when data were visibly synchronized.					
21. Synchronized data enabled manufacturing operation strategy efficiently enough to create sustainable supply chain in raw materials sectors when in needed.					



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ตอนที่ 8 แบบสอบถามภาคอุตสาหกรรมหลังใช้การบริหารแบบพร้อมเพรียงโดยใช้เทคโนโลยีสารสนเทศ  
 เข้าเสริมการบริหาร

	ระดับความคิดเห็น				
	5	4	3	2	1
รายการข้อความ	มาก	มาก	ปาน	น้อย	น้อย

	ที่สุด		กลาง		ที่สุด
22. Synchronization help create efficiency in manufacturing performance that were enough to create profit performance while consumer demands are on the rise, through product-quality-propelled or market-promotion-propelled?					
23. Synchronization increases manufacturing operation efficiency enough to create a profit performance when market promotion plans are effective with consumer demands expands exceedingly.					
24. While synchronized, order fulfillments from retailer and distributor enables efficient budget expense on operations routinely performed.					
25. Synchronization data involving order fulfillment from retailer and distributor efficiently creates logistic strategy that saves manufacturer's operation costs.					
26. Synchronized data on order fulfillments from retailer and distributor efficiently creates logistic operation that is budget wise and save logistic operation costs.					

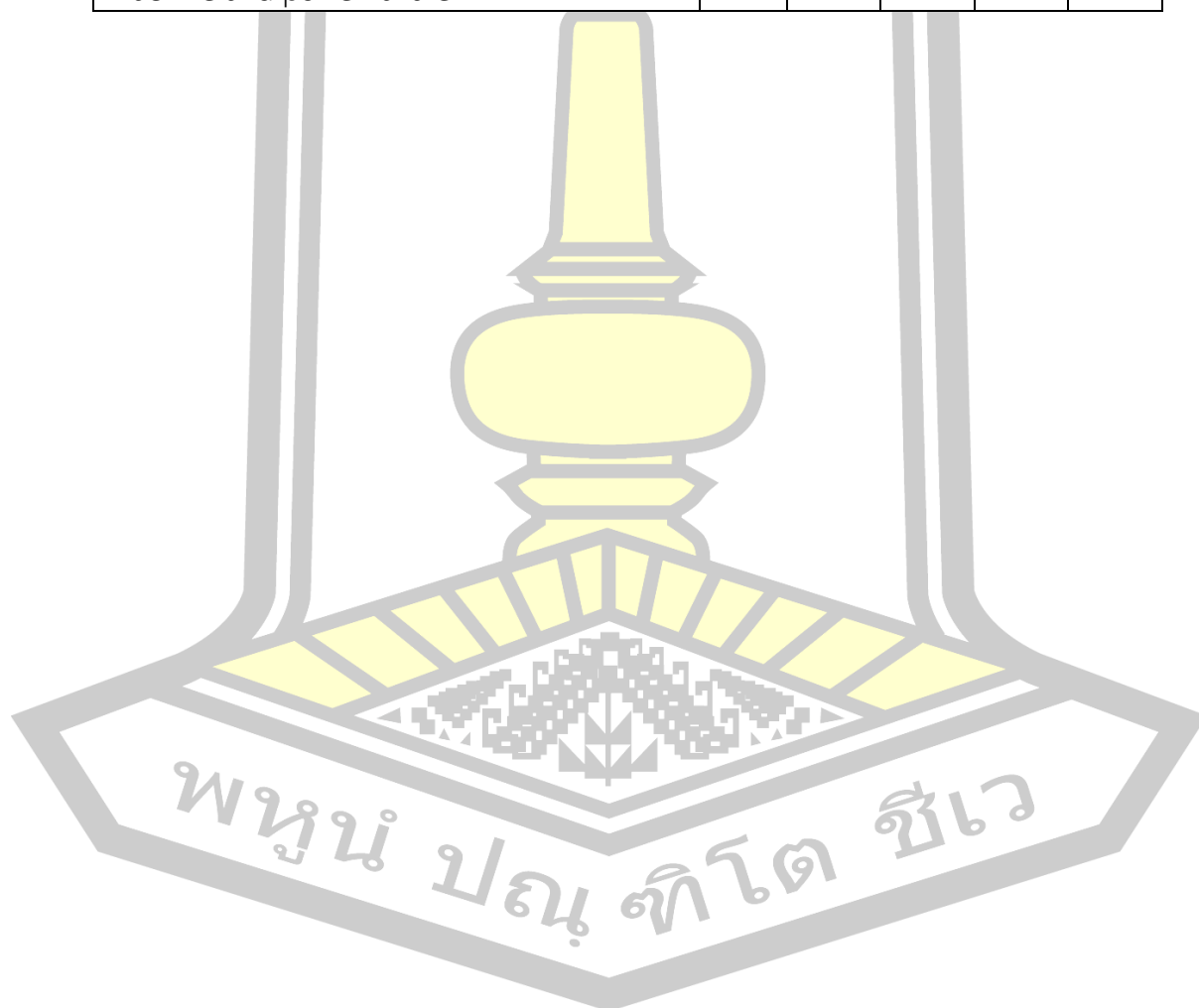


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รายการข้อความ	ระดับความคิดเห็น				
	5	4	3	2	1
	มากที่สุด	มาก	ปานกลาง	น้อย	น้อยที่สุด
27. Synchronization saves manufacturing budget and increase pool cash for raw material purchase that can increase future income from manufacturing.					
28. Synchronization can help forecast demand incongruence with market plans that can forecast future demand, therefore forecasting probable income in future manufacturing.					
29. With synchronization current					

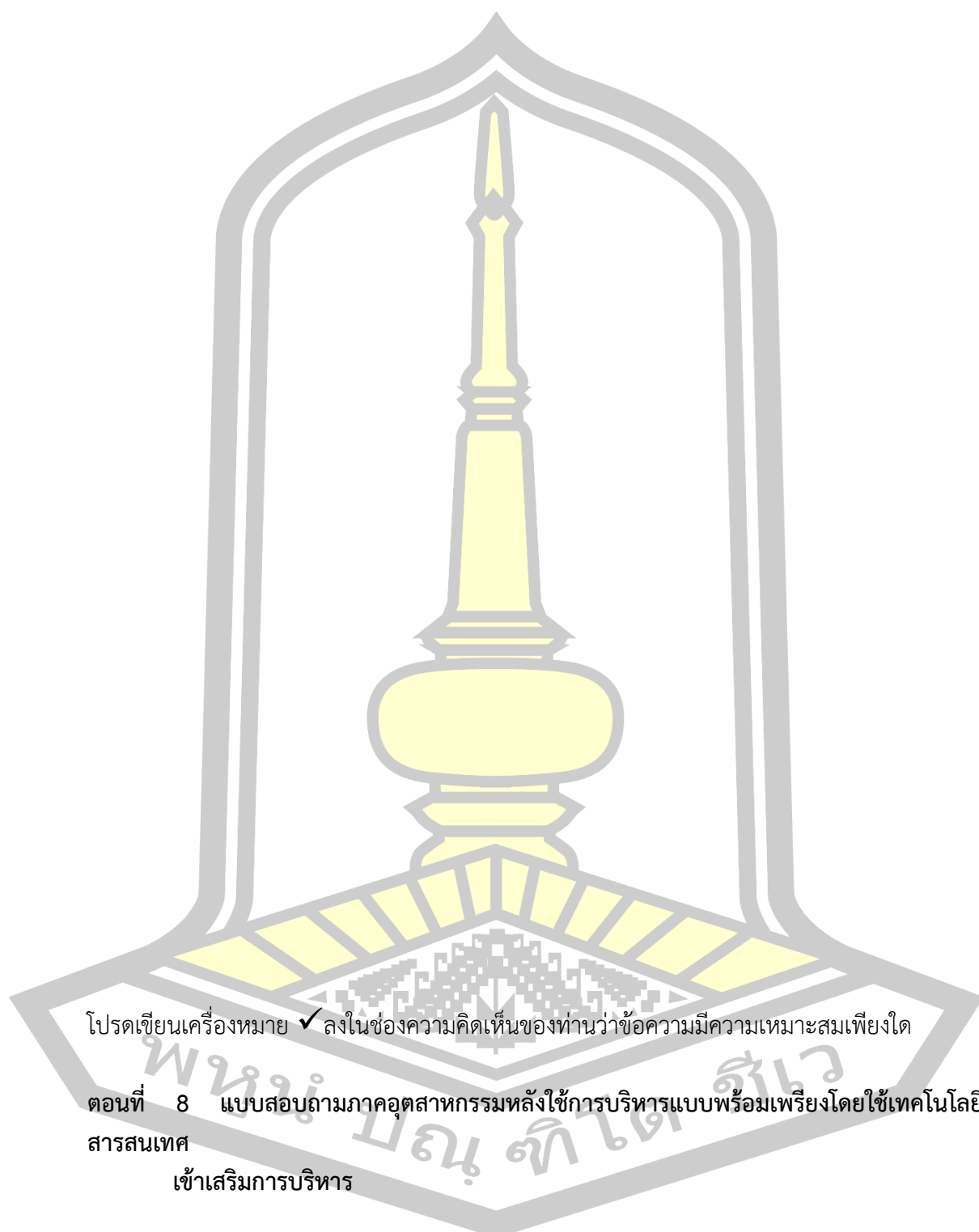
manufacturing operation met retails and distributors demand on time.					
30. Synchronization enable further communication performed well with information from retailer and distributor.					
31. Synchronized marketing personnel were more effective at completing tasks to meet demand and product marketability.					
32. Synchronized operation managers were more strategic at planning and able to complete production on time without machine and power failure.					



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 เข้าเสริมการบริหาร

รายการข้อความ	ระดับความคิดเห็น				
	5	4	3	2	1
	มากที่สุด	มาก	ปานกลาง	น้อย	น้อยที่สุด
33. Synchronized purchasing manager were able to forecast re-purchase amount effectively and secure raw material supply chain in marketing decisions planning.					
34. Manufacturing performance after synchronization met product market growth demand on a quarterly basis.					
35. Synchronization enabled manufacturing efficiency meet profit performance in current and future profitability in an untapped market.					
36. Synchronization in manufacturing operation met profit efficiency enough to sustain business.					
37. Synchronized warehouse stocking were able to meet new customer increase demand of product while its market increase during product life cycle.					
38. Synchronized warehouse efficiently perform its task of delivering product in-time for customers before its sales.					



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 เข้าเสริมการบริหาร

	ระดับความคิดเห็น				
	5	4	3	2	1
รายการข้อความ	มาก	มาก	ปาน	น้อย	น้อย

	ที่สุด		กลาง		ที่สุด
39. Synchronization enables pre-plans that can prevent and compensate for disruption, manufacturing downtime, and re-initiating manufacture operation if minimal disruption occurs.					
40. Synchronized retail sales re-order for stocking efficiently produces strategic production planning and scheme for the monthly, bi-monthly, or quarterly plan.					
41. Retailer/Distributor synchronized with manufacturer were able to make a good deal of order to make an efficient production operation that save costs; time, machine, human resources, and money.					
42. Retail stocking of retailer and distributor efficiently enough to produce a well-planned strategic for manufacturing warehouse efficiency through synchronization.					
43. Retail stocking of retailer and distributor efficiently enough to produce an efficient operation for delivering outstanding warehouse tasks through synchronization.					



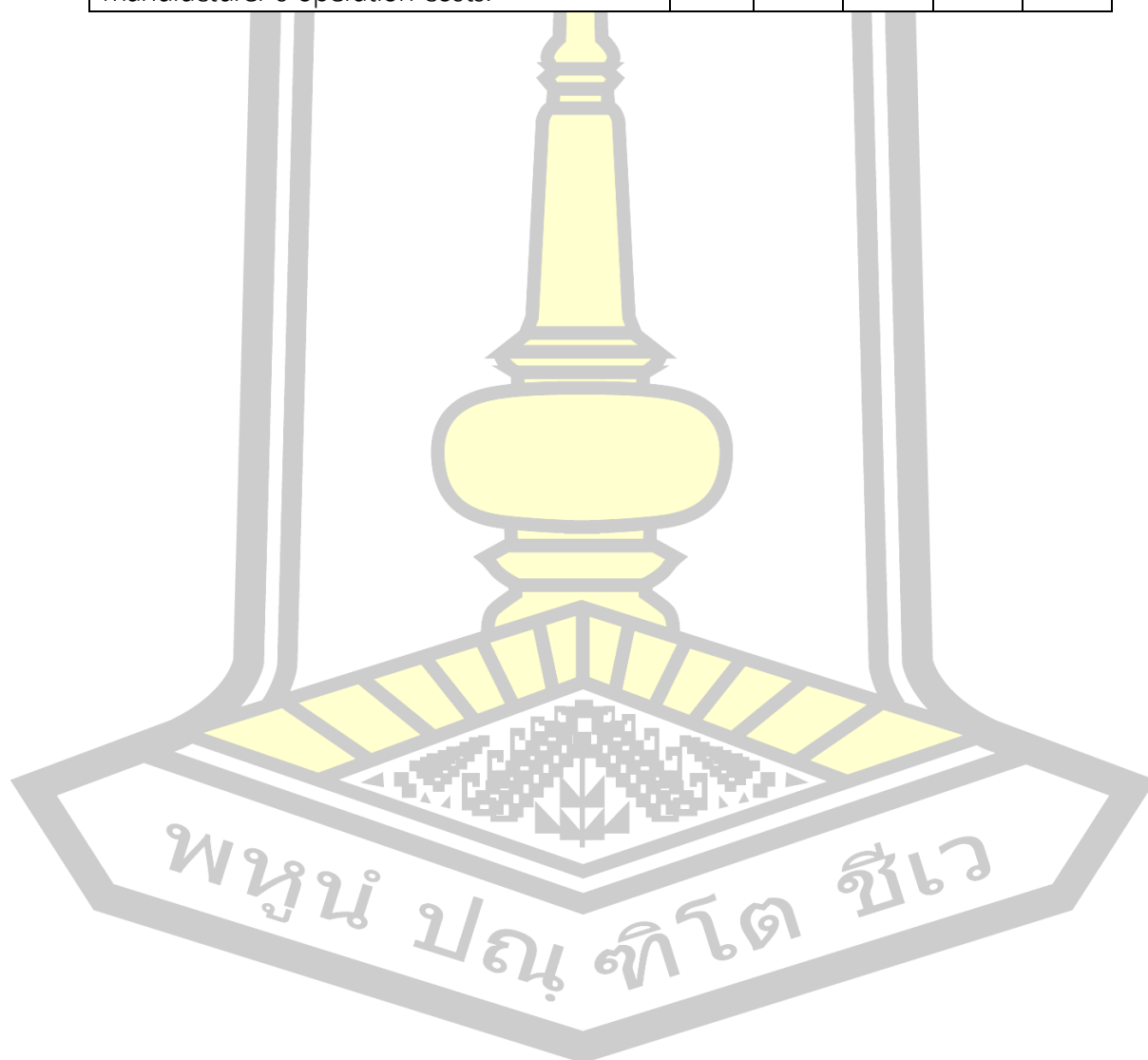


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 เข้าเสริมการบริหาร

รายการข้อความ	ระดับความคิดเห็น				
	5	4	3	2	1
	มากที่สุด	มาก	ปานกลาง	น้อย	น้อยที่สุด
44. Synchronization enabled manufacturing operation strategy efficient enough to make sustainable supply chain in raw materials needed.					
45. Synchronization enabled manufacturing performance efficient enough to create profit performance while consumer demands are on the rise.					
46. Synchronized manufacturing operation efficiency were able to create a profit performance when market promotion plans					

are effective and consumer demands expands exceedingly.					
47. Order fulfillment from retailer and distributor through synchronization enables efficient budget expense on operations routinely performed.					
48. Order fulfillment from retailer and distributor through synchronization efficiently creates logistic strategy that saves manufacturer's operation costs.					



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 เข้าเสริมการบริหาร

รายการข้อความ	ระดับความคิดเห็น				
	5	4	3	2	1
	มากที่สุด	มาก	ปานกลาง	น้อย	น้อยที่สุด
49. Order fulfillment from retailer and distributor through synchronization efficiently creates logistic operation that is budget wise and save logistic operation costs.					



## แบบสัมภาษณ์เพื่อการวิจัย

เรื่อง การประยุกต์ใช้เทคโนโลยีสารสนเทศในการบริหารลูกค้าเพื่อศึกษาผลกำไรที่น่าจะได้รับในภาคธุรกิจค้าปลีกและการผลิตที่มีการบริหารห่วงโซ่อุปทานแบบพร้อมเพรียง

แบบสัมภาษณ์นี้แบ่งออกเป็น 4 ส่วน 98 ข้อคำถาม ประกอบด้วย  
ส่วนนำ (ชื่อโครงการวิจัย)  
ส่วนผู้สัมภาษณ์

ชื่อ	ส่วนผู้ถูกสัมภาษณ์	จำนวน 4
ชื่อ	ส่วนคำถาม	จำนวน 98

การตอบแบบสอบถามการวิจัยฉบับนี้คำตอบของท่านมีความสำคัญอย่างยิ่งต่อการนำไปวิเคราะห์ข้อมูลเพื่อให้ได้งานวิจัยที่สามารถวิเคราะห์ปัญหาอันจะเกิดผลดีต่อการบริหารธุรกิจภายในประเทศได้ในอนาคต ดังนั้นกรุณาตอบทุกประเด็นคำถามให้ครบถ้วนทุกข้อ เพื่อทำให้เกิดความเที่ยงตรงในข้อมูลการวิจัยและจะเกิดประโยชน์ที่แท้จริงตามมา

อนึ่งข้อมูลที่ได้รับจากท่านจะเป็นประโยชน์ต่อการศึกษาการบริหารองค์กรทั้งภาครัฐและเอกชนในอนาคตในส่วนของการบริหารภาคค้าปลีกและภาคอุตสาหกรรมการผลิต ข้อมูลที่ได้จากการตอบแบบสอบถามและการสัมภาษณ์จะถูกเก็บไว้เป็นความลับ และผลที่ได้จากการศึกษาจะนำมาใช้ประมวลผลเพื่อวิเคราะห์และสรุปผลการวิจัยเท่านั้น เพื่อให้เกิดความประจักษ์แก่ผู้อ่านผลงานวิจัยและเพื่อนำไปศึกษาวิจัยต่อในส่วนของข้อมูลการศึกษาที่ยังขาดการพัฒนา

ข้าพเจ้าขอขอบพระคุณที่ท่านได้เสียสละเวลาเพื่อตอบแบบสอบถามทุกข้อตามความจริงที่ปรากฏ อย่างครบถ้วน หากท่านมีความสนใจที่จะขอรับสรุปรายงานเกี่ยวกับงานวิจัยนี้ โปรดแนบชื่อเบอร์โทร พร้อมระบุหน่วยงานที่เกี่ยวข้องหรือนามบัตรของท่านมาพร้อมกับแบบสอบถามชุดนี้ หากมีปัญหาหรือข้อสงสัยประการใดที่เกี่ยวข้องกับแบบสอบถาม กรุณาติดต่อกับข้าพเจ้าที่ เบอร์โทรศัพท์ 0923288885 หรือ อีเมล 63010960004@msu.ac.th

จิริฐิติ ศรีขาว

นิติตดุษฎีบัณฑิต สาขาบริหารธุรกิจและนวัตกรรมดิจิทัล  
คณะบัญชีและการจัดการ มหาวิทยาลัยมหาสารคาม

ลงชื่อ ..... (อาจารย์ที่ปรึกษา  
วิทยานิพนธ์)

(... ผศ. ดร. กิตติพล...วิแสง...) วันที่ ..... เดือน .....

พ.ศ. ....

แบบสัมภาษณ์ผู้ใช้ผลิตภัณฑ์

(ส่วนนำ)	
ชื่อโครงการวิจัย: การประยุกต์ใช้เทคโนโลยีสารสนเทศในการบริหารลูกค้าเพื่อศึกษาผลกำไรที่น่าจะได้รับในภาคธุรกิจค้าปลีกและการผลิตที่มีการบริหารห่วงโซ่อุปทานแบบพร้อมเพรียง	
(ส่วนผู้สัมภาษณ์)	
ชื่อ-สกุล	ผู้สัมภาษณ์ .....จิริรัฐติ..... ศรีชาว
วัน/เดือน/ปี	ที่
สัมภาษณ์	...../...../.....
เวลา:	.....
สถานที่:	.....
(ส่วนผู้ถูกสัมภาษณ์)	
ผู้ถูกสัมภาษณ์:	.....
ตำแหน่ง:	.....
ระดับการศึกษา:	.....
งาน:	.....
(ส่วนคำถาม)	
Customer interview before using web-based product usage tracking ผู้ใช้อก่อนการใช้เทคโนโลยีสารสนเทศในการบริหารการใช้อาหารเสริมอย่างต่อเนื่อง	
1. Please state how long have you been using the product, usage frequency, and lifestyle involved.	
.....	
.....	
.....	
.....	
2. Please give reason why you continued or discontinued to use the product. Please provide details.	
.....	

.....

.....

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.....

.....

3. Please talk about retail pricing and state if it is economical to use continually.

.....

.....

.....

.....

.....

(ส่วนนำ)

ชื่อโครงการวิจัย: การประยุกต์ใช้เทคโนโลยีสารสนเทศในการบริหารลูกค้าเพื่อศึกษาผลกำไรที่น่าจะได้รับในภาคธุรกิจค้าปลีกและการผลิตที่มีการบริหารห่วงโซ่อุปทานแบบพร้อมเพรียง

(ส่วนผู้สัมภาษณ์)

ชื่อ-สกุล      ผู้สัมภาษณ์      ....จิริฐิติ.....      ศรีชาว      วัน/เดือน/ปี      ที่

สัมภาษณ์ ...../...../.....

เวลา: .....

สถานที่: .....

(ส่วนผู้ถูกสัมภาษณ์)

ผู้ถูกสัมภาษณ์: .....

ตำแหน่ง: .....

ระดับการศึกษา:.....      อายุ

งาน: .....

(ส่วนคำถาม)

Customer interview before using web-based product usage tracking  
ผู้ใช้อก่อนการใช้เทคโนโลยีสารสนเทศในการบริหารการใช้อาหารเสริมอย่างต่อเนื่อง

4. Please state problems you have prior purchasing the merchandise, such as taking long trips to purchase the merchandise?

.....

.....

.....

.....

.....

5. Please explain how do you feel about the pricing and cost effectiveness of the pill.

.....

.....

.....

.....

.....

6. Were you thoroughly satisfied with pricing, cost effectiveness, and the economical pricing of the pill?

.....

.....

.....

.....

.....

.....

.....

.....

(ส่วนนำ)

ชื่อโครงการวิจัย: การประยุกต์ใช้เทคโนโลยีสารสนเทศในการบริหารลูกค้าเพื่อศึกษาผลกำไรที่น่าจะได้รับในภาคธุรกิจค้าปลีกและการผลิตที่มีการบริหารห่วงโซ่อุปทานแบบพร้อมเพรียง

(ส่วนผู้สัมภาษณ์)

ชื่อ-สกุล    ผู้สัมภาษณ์    ....จิริรัฐติ.....    ศรีขาว    วัน/เดือน/ปี    ที่

สัมภาษณ์ ...../...../.....

เวลา: .....

สถานที่: .....

(ส่วนผู้ถูกสัมภาษณ์)

ผู้ถูกสัมภาษณ์: .....

ตำแหน่ง: .....

ระดับการศึกษา:.....    อายุ

งาน: .....

(ส่วนคำถาม)

Customer interview before using web-based product usage tracking  
ผู้ใช้อก่อนการใช้เทคโนโลยีสารสนเทศในการบริหารการใช้อาหารเสริมอย่างต่อเนื่อง

7. Would you regard the product as essential item for long term use? Please state why do you think so?

.....  
 .....  
 .....  
 .....

8. Will you be using the item in the next 10 years with incremental increase in pricing from inflation, at the range to 10% due to inflation and fluctuations in manufacturing and retail services?

.....  
 .....  
 .....  
 .....

9. Please explain about product quality and your satisfaction of product pricing in regards to quality offered.

.....  
 .....  
 .....  
 .....  
 .....

(ส่วนนำ)

ชื่อโครงการวิจัย: การประยุกต์ใช้เทคโนโลยีสารสนเทศในการบริหารลูกค้าเพื่อศึกษาผลกำไรที่น่าจะได้รับในภาคธุรกิจค้าปลีกและการผลิตที่มีการบริหารห่วงโซ่อุปทานแบบพร้อมเพรียง

(ส่วนผู้สัมภาษณ์)

ชื่อ-สกุล    ผู้สัมภาษณ์    ..... จี.รัฐติ.....    ศรีชาว    ..... วัน/เดือน/ปี    ที่  
 สัมภาษณ์ ...../...../.....

เวลา: .....

สถานที่: .....

(ส่วนผู้ถูกสัมภาษณ์)

ผู้ถูกสัมภาษณ์: .....

ตำแหน่ง: .....

ระดับการศึกษา:.....

อายุ







ชื่อ-สกุล	ผู้สัมภาษณ์	.....จิริรัฐติ.....	ศรียา	วัน/เดือน/ปี	ที่
สัมภาษณ์ ...../...../.....					
เวลา: .....					
สถานที่: .....					
(ส่วนผู้ถูกสัมภาษณ์)					
ผู้ถูกสัมภาษณ์: .....					
ตำแหน่ง: .....					
ระดับการศึกษา:..... อายุ					
งาน: .....					
(ส่วนคำถาม)					
Customer interview before using web-based product usage tracking					
ผู้ใช้อก่อนการใช้เทคโนโลยีสารสนเทศในการบริหารการใช้อาหารเสริมอย่างต่อเนื่อง					
16. Please state how do you feel about using the product long term after you have been educated on its benefits.					
.....					
.....					
.....					
.....					
.....					
17. Do you feel more adhere to using the pill after you have been educated on its use and benefits?					
.....					
.....					
.....					
.....					
.....					
18. Please explain if you have barriers with using computers and smart phones to access internet					
.....					
.....					
.....					
.....					
.....					

(ส่วนนำ)					
ชื่อโครงการวิจัย: การประยุกต์ใช้เทคโนโลยีสารสนเทศในการบริหารลูกค้าเพื่อศึกษาผลกำไรที่น่าจะได้รับในภาคธุรกิจค้าปลีกและการผลิตที่มีการบริหารห่วงโซ่อุปทานแบบพร้อมเพรียง					
(ส่วนผู้สัมภาษณ์)					
ชื่อ-สกุล	ผู้สัมภาษณ์	.....จิริฐิติ.....	ศรียา	วัน/เดือน/ปี	ที่
สัมภาษณ์ ...../...../.....					
เวลา: .....					
สถานที่: .....					
(ส่วนผู้ถูกสัมภาษณ์)					
ผู้ถูกสัมภาษณ์: .....					
ตำแหน่ง: .....					
ระดับการศึกษา:..... อายุ					
งาน: .....					
(ส่วนคำถาม)					
Customer interview after using web-based product usage tracking หลังการใช้เทคโนโลยีสารสนเทศในการบริหารการใช้อาหารเสริมอย่างต่อเนื่อง					
19. Please state how long have you been using the product, usage frequency, and lifestyle involved and how well did web tracking conveniences you. ..... ..... ..... ..... .....					
20. Please give reason why you continued or discontinued to use the product, even though you have quit using IT system involved. ..... ..... ..... ..... .....					
21. If you have problems purchasing the merchandise, do you think web referral was a good alternative way to purchase product? Please state answer. ..... .....					



24. Please explain if you have any problems concerning the usage of web-based system.

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(ส่วนนำ)

ชื่อโครงการวิจัย: การประยุกต์ใช้เทคโนโลยีสารสนเทศในการบริหารลูกค้าเพื่อศึกษาผลกำไรที่น่าจะได้รับในภาคธุรกิจค้าปลีกและการผลิตที่มีการบริหารห่วงโซ่อุปทานแบบพร้อมเพรียง

(ส่วนผู้สัมภาษณ์)

ชื่อ-สกุล      ผู้สัมภาษณ์      ....จิริรัฐติ.....      ศรีชาว      วัน/เดือน/ปี      ที่

สัมภาษณ์ ...../...../.....

เวลา: .....

สถานที่: .....

(ส่วนผู้ถูกสัมภาษณ์)

ผู้ถูกสัมภาษณ์: .....

ตำแหน่ง: .....

ระดับการศึกษา:.....      อายุ

งาน: .....

(ส่วนคำถาม)

Customer interview after using web-based product usage tracking

หลังการใช้เทคโนโลยีสารสนเทศในการบริหารการใช้อาหารเสริมอย่างต่อเนื่อง

25. Do you feel more adhere to product use when using web-based system? Please explain.

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26. Please state how do you feel when using web-based system in long term.

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30. How do you feel if web-based system would evolve into digital patronage in the future that lets you handle adherence better?

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31. Please explain about your store management prior synchronization, how well did it perform in terms of efficiencies and operations.

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Please provide any suggestion you wish.

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แบบสัมภาษณ์ร้านค้า

(ส่วนนำ)

ชื่อโครงการวิจัย: การประยุกต์ใช้เทคโนโลยีสารสนเทศในการบริหารลูกค้าเพื่อศึกษาผลกำไรที่น่าจะได้รับในภาคธุรกิจค้าปลีกและการผลิตที่มีการบริหารห่วงโซ่อุปทานแบบพร้อมเพรียง

(ส่วนผู้สัมภาษณ์)

ชื่อ-สกุล      ผู้สัมภาษณ์      .....จิริฐิติ.....      ศรีชาว      วัน/เดือน/ปี      ที่

สัมภาษณ์ ...../...../.....

เวลา: .....

สถานที่: .....

(ส่วนผู้ถูกสัมภาษณ์)

ผู้ถูกสัมภาษณ์: .....













<p>.....</p> <p>.....</p> <p>.....</p> <p>46. With synchronization were your workers able to complete all tasks effectively given by managers? Please state its usefulness.</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p>					
<p>(ส่วนนำ)</p> <p>ชื่อโครงการวิจัย: การประยุกต์ใช้เทคโนโลยีสารสนเทศในการบริหารลูกค้าเพื่อศึกษาผลกำไรที่น่าจะได้รับในภาคธุรกิจค้าปลีกและการผลิตที่มีการบริหารห่วงโซ่อุปทานแบบพร้อมเพรียง</p>					
<p>(ส่วนผู้สัมภาษณ์)</p> <p>ชื่อ-สกุล    ผู้สัมภาษณ์    ....จิริรัฐติ.....    ศรีชาว    วัน/เดือน/ปี    ที่</p> <p>สัมภาษณ์ ...../...../.....</p> <p>เวลา: .....</p> <p>สถานที่: .....</p>					
<p>(ส่วนผู้ถูกสัมภาษณ์)</p> <p>ผู้ถูกสัมภาษณ์: .....</p> <p>ตำแหน่ง: .....</p> <p>ระดับการศึกษา:.....    อายุ</p> <p>งาน: .....</p>					
<p>(ส่วนคำถาม)</p> <p><b>Retailer-Distributor Interview after Synchronization</b></p> <p><b>แบบสัมภาษณ์ร้านค้า ภายหลังการบริหารแบบพร้อมเพรียงโดยใช้เทคโนโลยีสารสนเทศเข้าเสริม</b></p>					
<p>47. With synchronization data, your store clerk able to make customer adhere to product use continually? Please state your answer.</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p>					
<p>48. Does synchronization perform supply chain management effectively? Please</p>					



provide information regarding sustainability and profit margin increase if any.

49. Do you feel that synchronized data at were enough for the operation of your store management in terms of forecasting sales, re-stocking products, improve sales, and make promotions? Please state your answer.

(ส่วนนำ)

ชื่อโครงการวิจัย: การประยุกต์ใช้เทคโนโลยีสารสนเทศในการบริหารลูกค้าเพื่อศึกษาผลกำไรที่น่าจะได้รับในภาคธุรกิจค้าปลีกและการผลิตที่มีการบริหารห่วงโซ่อุปทานแบบพร้อมเพรียง

(ส่วนผู้สัมภาษณ์)

ชื่อ-สกุล      ผู้สัมภาษณ์      ....จิริฐิติ.....      ศรีขาว      วัน/เดือน/ปี      ที่  
 สัมภาษณ์ ...../...../.....

เวลา: .....

สถานที่: .....

(ส่วนผู้ถูกสัมภาษณ์)

ผู้ถูกสัมภาษณ์: .....

ตำแหน่ง: .....

ระดับการศึกษา:..... อายุ

งาน: .....

(ส่วนคำถาม)

Retailer-Distributor Interview after Synchronization

แบบสัมภาษณ์ร้านค้า ภายหลังการบริหารแบบพร้อมเพรียงโดยใช้เทคโนโลยีสารสนเทศเข้าเสริม

50. Do you think that with better web-based system can derive a system for digital patronage use in conjunction with daily routine to make adherence more involve-able? Please state your answer.

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51. In what ways does synchronization solve your store? Please provide details.

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52. Does synchronization solve problems arising from product re-stocking and warehousing? Please provide information on how it helped you solved the problem.

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(ส่วนนำ)

ชื่อโครงการวิจัย: การประยุกต์ใช้เทคโนโลยีสารสนเทศในการบริหารลูกค้าเพื่อศึกษาผลกำไรที่  
น่าจะได้รับในภาคธุรกิจค้าปลีกและการผลิตที่มีการบริหารห่วงโซ่อุปทานแบบพร้อมเพรียง

(ส่วนผู้สัมภาษณ์)

ชื่อ-สกุล    ผู้สัมภาษณ์    .....จิริฐิติ.....    ศรีชาว    วัน/เดือน/ปี    ที่  
สัมภาษณ์ ...../...../.....

เวลา: .....

สถานที่: .....

(ส่วนผู้ถูกสัมภาษณ์)

ผู้ถูกสัมภาษณ์: .....

ตำแหน่ง: .....

ระดับการศึกษา:.....

อายุ



(ส่วนผู้ถูกสัมภาษณ์)	
ผู้ถูกสัมภาษณ์: .....	
ตำแหน่ง: .....	
ระดับการศึกษา:.....	อายุ
งาน: .....	
(ส่วนคำถาม)	
Retailer-Distributor Interview after Synchronization	
แบบสัมภาษณ์ร้านค้า ภายหลังจากการบริหารแบบพร้อมเพรียงโดยใช้เทคโนโลยีสารสนเทศเข้าเสริม	
<p>55. Does synchronization help you ease with gaining profits and customer trust within demographic data and regional economy efficiently, leading to profit performance? Please state your answer.</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p>	
<p>56. Were your store clerk able to make profit continually through the use of limited data provided by normal ways of business management? Please state your answer.</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p>	
<p>57. How does synchronization help your business better in terms of overall retail management?</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p>	
(ส่วนนำ)	
ชื่อโครงการวิจัย: การประยุกต์ใช้เทคโนโลยีสารสนเทศในการบริหารลูกค้าเพื่อศึกษาผลกำไรที่น่าจะได้รับในภาคธุรกิจค้าปลีกและการผลิตที่มีการบริหารห่วงโซ่อุปทานแบบพร้อมเพรียง	
(ส่วนผู้สัมภาษณ์)	



(ส่วนนำ)					
ชื่อโครงการวิจัย: การประยุกต์ใช้เทคโนโลยีสารสนเทศในการบริหารลูกค้าเพื่อศึกษาผลกำไรที่น่าจะได้รับในภาคธุรกิจค้าปลีกและการผลิตที่มีการบริหารห่วงโซ่อุปทานแบบพร้อมเพรียง					
(ส่วนผู้สัมภาษณ์)					
ชื่อ-สกุล	ผู้สัมภาษณ์	.....จิริฐิติ.....	ศรียาว	วัน/เดือน/ปี	ที่
สัมภาษณ์ .....					
เวลา:		.....			
สถานที่:		.....			
(ส่วนผู้ถูกสัมภาษณ์)					
ผู้ถูกสัมภาษณ์:		.....			
ตำแหน่ง:		.....			
ระดับการศึกษา:		.....			อายุ
งาน:		.....			
(ส่วนคำถาม)					
Manufacturer Interview prior Synchronization					
แบบสัมภาษณ์โรงงาน การผลิตก่อนการบริหารแบบพร้อมเพรียงโดยใช้เทคโนโลยีสารสนเทศเข้าเสริม					
59. Does your current management in production operation had efficiencies enough to meet high throughput that meets profit performance in current market and untapped market beyond? Please state.					
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60. Does your manufacturing operation capacity meet product market demand from retailer and distributor within short time and long term after? Could you explain its efficiencies?					
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<b>(ส่วนนำ)</b> ชื่อโครงการวิจัย: การประยุกต์ใช้เทคโนโลยีสารสนเทศในการบริหารลูกค้าเพื่อศึกษาผลกำไรที่น่าจะได้รับในภาคธุรกิจค้าปลีกและการผลิตที่มีการบริหารห่วงโซ่อุปทานแบบพร้อมเพรียง					
<b>(ส่วนผู้สัมภาษณ์)</b> ชื่อ-สกุล    ผู้สัมภาษณ์    .....จิริรัฐติ.....    ศรีชาว    วัน/เดือน/ปี    ที่ สัมภาษณ์ ...../...../.....					
เวลา: .....					
สถานที่: .....					
<b>(ส่วนผู้ถูกสัมภาษณ์)</b> ผู้ถูกสัมภาษณ์: .....					
ตำแหน่ง: .....					
ระดับการศึกษา:.....    อายุ					
งาน: .....					
<b>(ส่วนคำถาม)</b>					
Manufacturer Interview prior Synchronization แบบสัมภาษณ์โรงงาน การผลิตก่อนการบริหารแบบพร้อมเพรียงโดยใช้เทคโนโลยีสารสนเทศเข้าเสริม					
63. Were your profit performance enables you to sustain supply chain in raw materials needed for future production? ..... ..... ..... ..... ..... ..... ..... .....					



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64. Were re-order from retail and distributor enables you to perform strategic production planning, warehousing, and distribution? Please state your answer.

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(ส่วนนำ)  
ชื่อโครงการวิจัย: การประยุกต์ใช้เทคโนโลยีสารสนเทศในการบริหารลูกค้าเพื่อศึกษาผลกำไรที่น่าจะได้รับในภาคธุรกิจค้าปลีกและการผลิตที่มีการบริหารห่วงโซ่อุปทานแบบพร้อมเพรียง

(ส่วนผู้สัมภาษณ์)  
ชื่อ-สกุล    ผู้สัมภาษณ์    .....จิริรัฐติ.....    ศรีขาว    วัน/เดือน/ปี    ที่  
สัมภาษณ์ ...../...../.....  
เวลา: .....  
สถานที่: .....

(ส่วนผู้ถูกสัมภาษณ์)  
ผู้ถูกสัมภาษณ์: .....  
ตำแหน่ง: .....  
ระดับการศึกษา:.....    อายุ  
งาน: .....

(ส่วนคำถาม)  
Manufacturer Interview prior Synchronization  
แบบสัมภาษณ์โรงงาน การผลิตก่อนการบริหารแบบพร้อมเพรียงโดยใช้เทคโนโลยีสารสนเทศเข้าเสริม

65. Were re-order from retail and distributor enables to perform more efficiencies in operation that save costs, time, machine, human resource, and money? Please provide answers.

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67. Were your warehouse manager able to distribute goods efficiently when retailer and distributor re-order extensively and were conventional management effective in carrying out operations? Please provide answer.

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68. Were fulfillment or re-order for stocking from retailer and distributor efficient enough to help manufacturer warehouse saves budget on its logistic strategies and operational costs? Please state answer.

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(ส่วนนำ)

ชื่อโครงการวิจัย: การประยุกต์ใช้เทคโนโลยีสารสนเทศในการบริหารลูกค้าเพื่อศึกษาผลกำไรที่น่าจะได้รับในภาคธุรกิจค้าปลีกและการผลิตที่มีการบริหารห่วงโซ่อุปทานแบบพร้อมเพรียง

(ส่วนผู้สัมภาษณ์)

ชื่อ-สกุล    ผู้สัมภาษณ์    .....จิริฐิติ.....    ศรีชิว    วัน/เดือน/ปี    ที่  
 สัมภาษณ์ ...../...../.....

เวลา: .....

สถานที่: .....

(ส่วนผู้ถูกสัมภาษณ์)

ผู้ถูกสัมภาษณ์: .....

ตำแหน่ง: .....

ระดับการศึกษา:.....

อายุ

งาน: .....

(ส่วนคำถาม)

## Manufacturer Interview prior Synchronization

แบบสัมภาษณ์โรงงาน การผลิตก่อนการบริหารแบบพร้อมเพรียงโดยใช้เทคโนโลยีสารสนเทศเข้าเสริม

69. With conventional management, were your production line capable of withstanding high volume throughput in high market demand situation? Please explain.

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70. Were your warehouse and logistic operation had efficiencies and performance that matches current market demand and tomorrow's market demand?

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(ส่วนนำ)

ชื่อโครงการวิจัย: การประยุกต์ใช้เทคโนโลยีสารสนเทศในการบริหารลูกค้าเพื่อศึกษาผลกำไรที่น่าจะได้รับในภาคธุรกิจค้าปลีกและการผลิตที่มีการบริหารห่วงโซ่อุปทานแบบพร้อมเพรียง

(ส่วนผู้สัมภาษณ์)

ชื่อ-สกุล      ผู้สัมภาษณ์      ....จิริรัฐติ.....      ศรีชาว      วัน/เดือน/ปี      ที่

สัมภาษณ์ ...../...../.....

เวลา: .....

สถานที่: .....





(ส่วนนำ)					
ชื่อโครงการวิจัย: การประยุกต์ใช้เทคโนโลยีสารสนเทศในการบริหารลูกค้าเพื่อศึกษาผลกำไรที่น่าจะได้รับในภาคธุรกิจค้าปลีกและการผลิตที่มีการบริหารห่วงโซ่อุปทานแบบพร้อมเพรียง					
(ส่วนผู้สัมภาษณ์)					
ชื่อ-สกุล	ผู้สัมภาษณ์	.....จิริฐิติ.....	ศรียาว	วัน/เดือน/ปี	ที่
สัมภาษณ์ ...../...../.....					
เวลา: .....					
สถานที่: .....					
(ส่วนผู้ถูกสัมภาษณ์)					
ผู้ถูกสัมภาษณ์: .....					
ตำแหน่ง: .....					
ระดับการศึกษา:..... อายุ					
งาน: .....					
(ส่วนคำถาม)					
Manufacturer Interview prior Synchronization					
แบบสัมภาษณ์โรงงาน การผลิตก่อนการบริหารแบบพร้อมเพรียงโดยใช้เทคโนโลยีสารสนเทศเข้าเสริม					
75. Do you feel the need for further management adding to current management that you are managing?					
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76. How do you feel about current management on its efficiencies in production, marketing, warehousing and distribution?					
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<p>.....</p> <p>.....</p> <p>.....</p> <p>80. Was synchronization data from web-based enables you to correctly forecast market demands from product users, retailers, and distributors and using it to forecast raw materials to be purchase, then sustain of supply chain? Please state your answer.</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p>	
<p>(ส่วนนำ)</p> <p>ชื่อโครงการวิจัย: การประยุกต์ใช้เทคโนโลยีสารสนเทศในการบริหารลูกค้าเพื่อศึกษาผลกำไรที่น่าจะได้รับในภาคธุรกิจค้าปลีกและการผลิตที่มีการบริหารห่วงโซ่อุปทานแบบพร้อมเพรียง</p>	
<p>(ส่วนผู้สัมภาษณ์)</p> <p>ชื่อ-สกุล    ผู้สัมภาษณ์    ....จิริจิติ.....    ศรีขาว    วัน/เดือน/ปี    ที่</p> <p>สัมภาษณ์ ...../...../.....</p> <p>เวลา: .....</p> <p>สถานที่: .....</p>	
<p>(ส่วนผู้ถูกสัมภาษณ์)</p> <p>ผู้ถูกสัมภาษณ์: .....</p> <p>ตำแหน่ง: .....</p> <p>ระดับการศึกษา:.....    อายุ</p> <p>งาน: .....</p>	
<p>(ส่วนคำถาม)</p> <p>Manufacturer Interview after Synchronization</p> <p>แบบสัมภาษณ์โรงงาน การผลิตภายหลังการบริหารแบบพร้อมเพรียงโดยใช้เทคโนโลยีสารสนเทศ</p> <p>เข้าเสริม</p>	

81. In regards with synchronization, was your manufacturing efficiencies provides you marketing plans to achieve profit performance that enables you to sustain supply chain in raw materials needed for future production? Please provide your answer.

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82. Can web-based synchronize data, could re-order from retail and distributor enables you to perform strategic production planning, warehousing, and distribution? Also, can you forecast production planning, raw material procurements, budget-save planning, through data visibility from web-based? Please state your answer.

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(ส่วนนำ)

ชื่อโครงการวิจัย: การประยุกต์ใช้เทคโนโลยีสารสนเทศในการบริหารลูกค้าเพื่อศึกษาผลกำไรที่น่าจะได้รับในภาคธุรกิจค้าปลีกและการผลิตที่มีการบริหารห่วงโซ่อุปทานแบบพร้อมเพรียง

(ส่วนผู้สัมภาษณ์)

ชื่อ-สกุล    ผู้สัมภาษณ์    .....จิริฐิติ.....    ศรีชาว    วัน/เดือน/ปี    ที่

สัมภาษณ์ ...../...../.....

เวลา: .....

สถานที่: .....

(ส่วนผู้ถูกสัมภาษณ์)

ผู้ถูกสัมภาษณ์: .....

ตำแหน่ง: .....

ระดับการศึกษา:.....

อายุ

งาน: .....

(ส่วนคำถาม)

### Manufacturer Interview after Synchronization

แบบสัมภาษณ์โรงงาน การผลิตภายหลังการบริหารแบบพร้อมเพรียงโดยใช้เทคโนโลยีสารสนเทศ  
เข้าเสริม

83. Does synchronization enable to perform more efficiencies in operation that save costs, time, machine, human resource, and money? Please provide % margins involved in savings. Please provide answers.

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84. Can synchronization provide visibility that production manager can create pre-plans to prevent disruption prior or while producing items to be delivered, in order to secure product supply chain to customer? Please provide answers.

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(ส่วนนำ)

ชื่อโครงการวิจัย: การประยุกต์ใช้เทคโนโลยีสารสนเทศในการบริหารลูกค้าเพื่อศึกษาผลกำไรที่  
น่าจะได้รับในภาคธุรกิจค้าปลีกและการผลิตที่มีการบริหารห่วงโซ่อุปทานแบบพร้อมเพรียง

(ส่วนผู้สัมภาษณ์)

ชื่อ-สกุล      ผู้สัมภาษณ์      .....จิริรัฐติ.....      ศรีชิว      วัน/เดือน/ปี      ที่  
สัมภาษณ์ ...../...../.....

เวลา: .....

สถานที่: .....

(ส่วนผู้ถูกสัมภาษณ์)

ผู้ถูกสัมภาษณ์: .....

ตำแหน่ง: .....



(ส่วนผู้ถูกสัมภาษณ์)					
ผู้ถูกสัมภาษณ์: .....					
ตำแหน่ง: .....					
ระดับการศึกษา:.....					อายุ
งาน: .....					
(ส่วนคำถาม)					
<b>Manufacturer Interview after Synchronization</b> <b>แบบสัมภาษณ์โรงงาน การผลิตภายหลังการบริหารแบบพร้อมเพรียงโดยใช้เทคโนโลยีสารสนเทศ</b> <b>เข้าเสริม</b>					
<p>87. Overall, does synchronization perform better than conventional management, or perform well together with conventional management as addendum?</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p>					
<p>88. In managerial position, would you extensively use the synchronization proposed in study to further improve your production planning and marketing to meet industrial performance standards and meet market demand in an untapped area?</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p>					
(ส่วนนำ)					
ชื่อโครงการวิจัย: การประยุกต์ใช้เทคโนโลยีสารสนเทศในการบริหารลูกค้าเพื่อศึกษาผลกำไรที่น่าจะได้รับในภาคธุรกิจค้าปลีกและการผลิตที่มีการบริหารห่วงโซ่อุปทานแบบพร้อมเพรียง					
(ส่วนผู้สัมภาษณ์)					
ชื่อ-สกุล	ผู้สัมภาษณ์	.....จิริรัฐติ.....	ศรีชา	วัน/เดือน/ปี	ที่







..... .....					
(ส่วนนำ) ชื่อโครงการวิจัย: การประยุกต์ใช้เทคโนโลยีสารสนเทศในการบริหารลูกค้าเพื่อศึกษาผลกำไรที่ น่าจะได้รับในภาคธุรกิจค้าปลีกและการผลิตที่มีการบริหารห่วงโซ่อุปทานแบบพร้อมเพรียง					
(ส่วนผู้สัมภาษณ์)					
ชื่อ-สกุล	ผู้สัมภาษณ์	.....จิริฐิติ.....	ศรีชาว	วัน/เดือน/ปี	ที่
สัมภาษณ์ .....		.....		.....	
เวลา:		.....			
สถานที่:		.....			
(ส่วนผู้ถูกสัมภาษณ์)					
ผู้ถูกสัมภาษณ์:		.....			
ตำแหน่ง:		.....			
ระดับการศึกษา:		.....		อายุ	
งาน:		.....			
(ส่วนคำถาม)					
Manufacturer Interview after Synchronization					
แบบสัมภาษณ์โรงงาน การผลิตภายหลังการบริหารแบบพร้อมเพรียงโดยใช้เทคโนโลยีสารสนเทศ เข้าเสริม					
93. With synchronization, were you able to forecast manufacturing operations effectively including market demand, leading to supply chain sustainability? Please state answer.					
..... ..... ..... ..... ..... ..... ..... .....					
94. With information given through web-based in synchronization, were you able to forecast sales similar to retailers and distributors?					
..... ..... .....					

..... ..... ..... ..... ..... ..... ..... ..... .....					
<b>(ส่วนนำ)</b> ชื่อโครงการวิจัย: การประยุกต์ใช้เทคโนโลยีสารสนเทศในการบริหารลูกค้าเพื่อศึกษาผลกำไรที่น่าจะได้รับในภาคธุรกิจค้าปลีกและการผลิตที่มีการบริหารห่วงโซ่อุปทานแบบพร้อมเพรียง					
<b>(ส่วนผู้สัมภาษณ์)</b> ชื่อ-สกุล    ผู้สัมภาษณ์    .....จิริรัฐติ.....    ศรีชาว    วัน/เดือน/ปี    ที่ สัมภาษณ์ ...../...../.....					
เวลา: .....					
สถานที่: .....					
<b>(ส่วนผู้ถูกสัมภาษณ์)</b> ผู้ถูกสัมภาษณ์: .....					
ตำแหน่ง: .....					
ระดับการศึกษา:.....    อายุ					
งาน: .....					
<b>(ส่วนคำถาม)</b>					
Manufacturer Interview after Synchronization แบบสัมภาษณ์โรงงาน การผลิตภายหลังการบริหารแบบพร้อมเพรียงโดยใช้เทคโนโลยีสารสนเทศ เข้าเสริม					
95. Do you feel that synchronization sufficed the need for your manufacturing management? ..... ..... .....					
96. How do you feel about synchronization in its efficiencies in production, marketing, warehousing and distribution, from web-based data visibilities that enabled further management planning? Please state your answer.					



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Please provide additional information if you wish.

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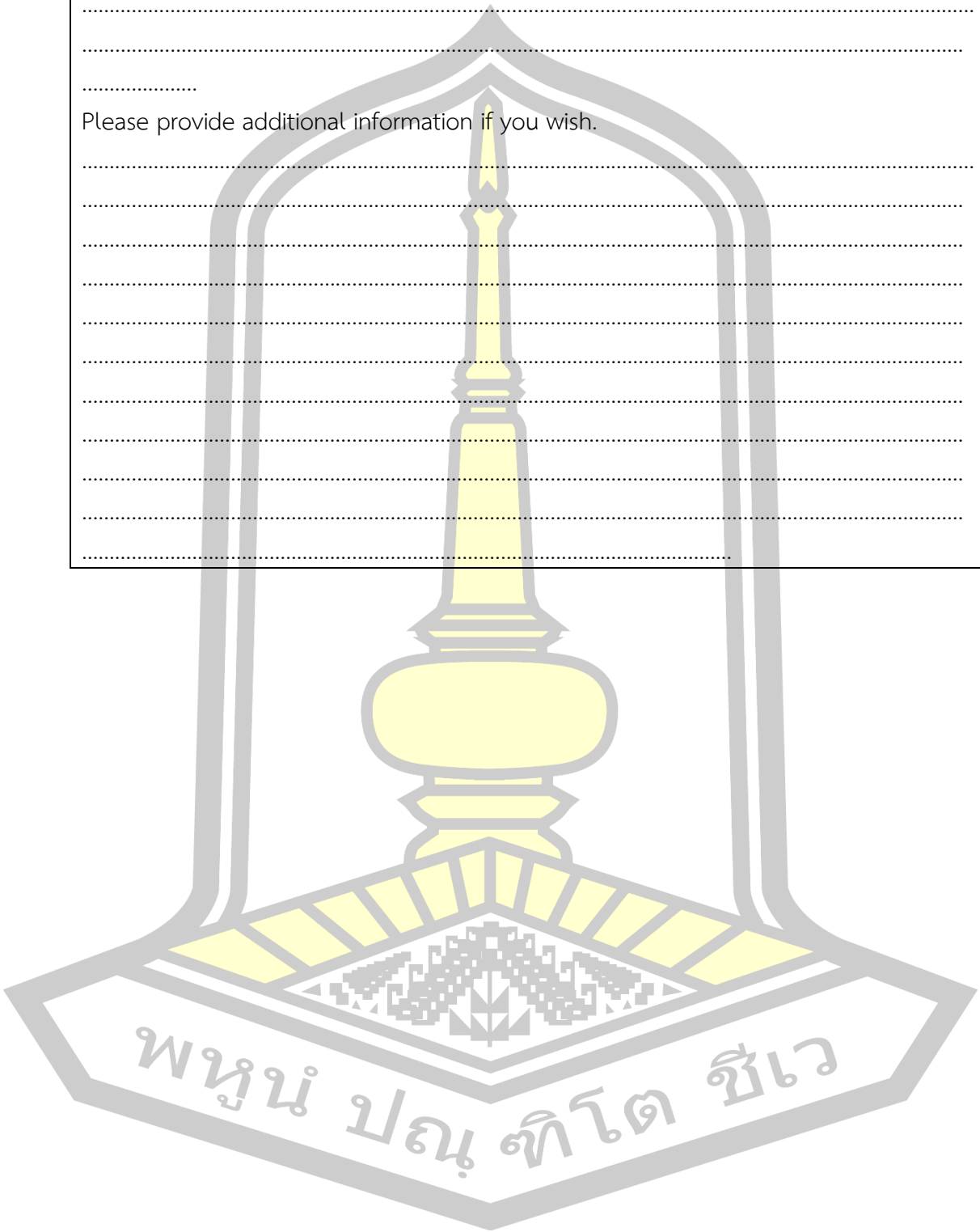
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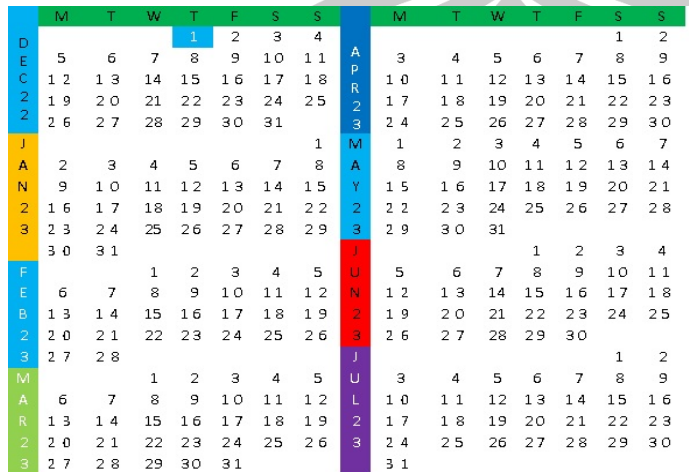
.....



## APPENDIX D

### BACK-END SYSTEM OF WEB SYNCHRONIZATION SYSTEM

Figure 1. Calendar use as tracking 180 days with Back End



Backend System for Retail Managers

Backend System for Manufacturing Managers

The figure shows highlighted text on each day of the month, to tell user their start time.

Figure 2. Web System Input system with calendar with links

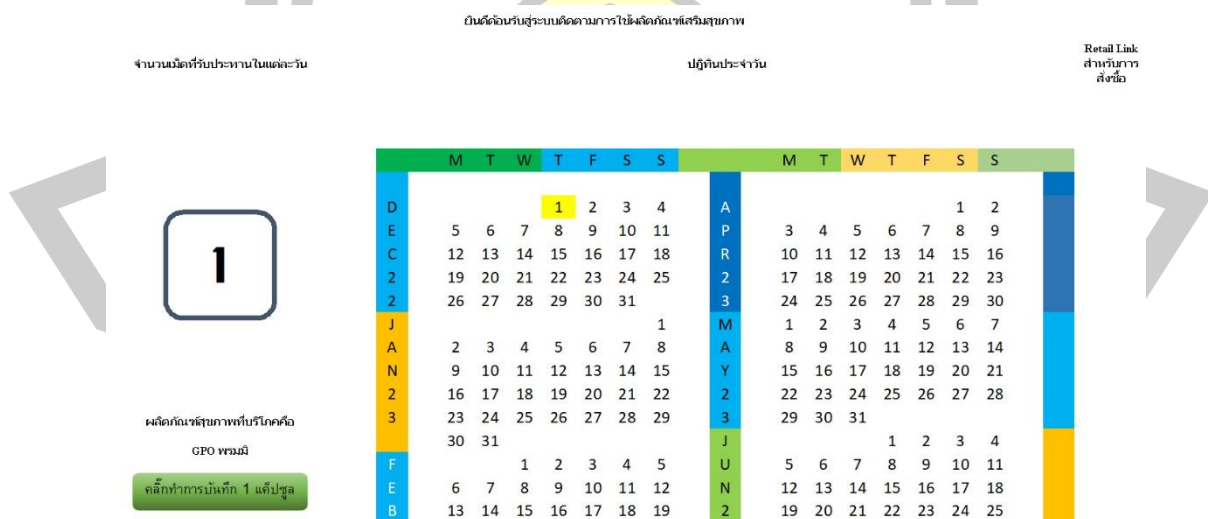
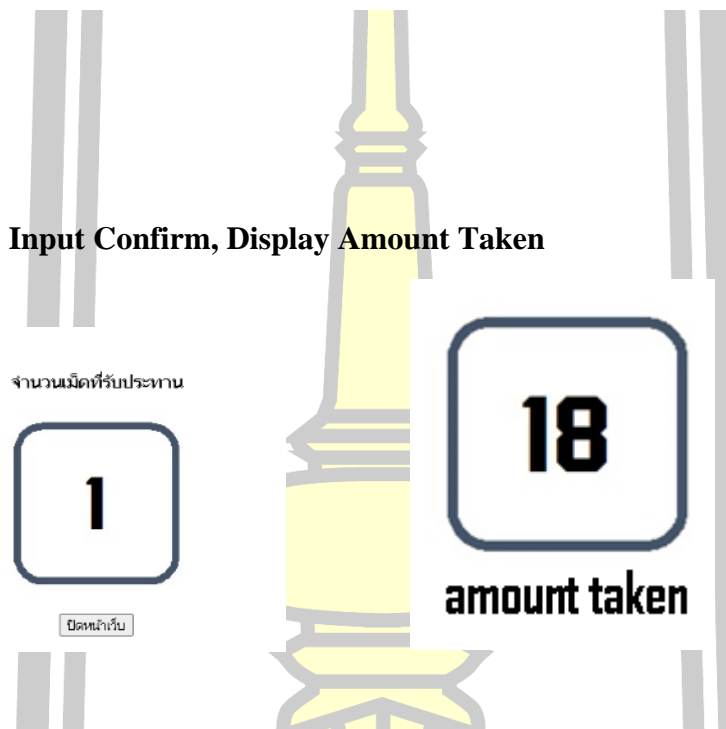


Figure 3. Confirmation for Input



Figure 4. Input Confirm, Display Amount Taken



Data results and Discussion

Figure 5. Back End System



### BACK END BUGGUB INFOGRAPHIC SYSTEM

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Figure 6. Excel obtain system for synchronization work

### BACK END BUGGUB INFOGRAPHIC SYSTEM

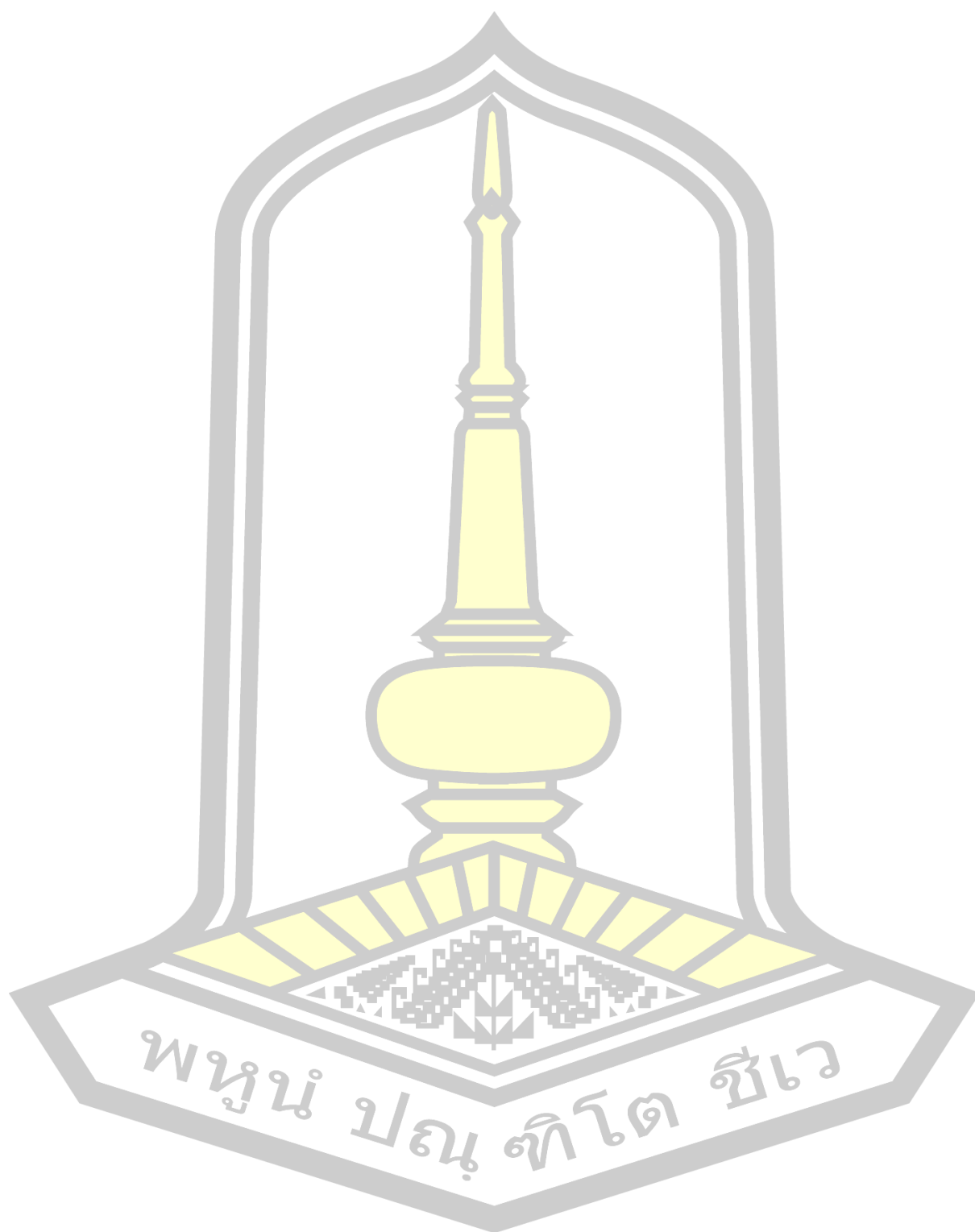
TIMESTAMP 18/11/2565 6:52 PM

CLICK ON DATE FOR EXCEL SHEET FOR SYNCHRONIZATION WORK

J							1
A	2	3	4	5	6	7	8
N	9	10	11	12	13	14	15
2	16	17	18	19	20	21	22
3	23	24	25	26	27	28	29
	30	31					

มณฑลพิษณุโลก





## BIOGRAPHY

<b>NAME</b>	Jirathi Srikhao
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<b>ADDRESS</b>	28 Moo 13 Tambon Phangkhon, Amphur Phangkhon, Sakonnakhon 47160
<b>POSITION</b>	-
<b>PLACE OF WORK</b>	-
<b>EDUCATION</b>	2011. Bachelor of Pharmacy in Pharmaceutical Sciences, Rangsit University. 2024. Doctor of Philosophy in Business Management, Mahasarakham University.
<b>Research grants &amp; awards</b>	-
<b>Research output</b>	-

