IMPROVING EFFICINCY OF FRESH PRODUCT MANAGEMENT SYSTEM IN CONVENIENCE STORE

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ด้วยสภาวะการแข่งขันทางธุรกิจและพฤติกรรมการบริโภคที่เปลี่ยนแปลงไปตลอดเวลาของผู้บริโภค จึงนำไปสู่การปรับตัวของธุรกิจร้านสะดวกซื้อให้สอดคล้องกลับสภาวะในปัจจุบัน สินค้าอาหารพร้อมทานซึ่งมีอายุสั้นถูกกำหนดให้เป็นสินค้ากลยุทธ์เพื่อสร้างความแตกต่างทางธุรกิจและตอบสนองความต้องการของลูกค้า ทั้งนี้กำไรต่อหน่วยของสิ นค้าชนิดนี้ยังมีมูลค่าสูงกว่าสินค้าอุปโภคทั่วไป จึงเป็นกลุ่มสินค้าที่ควรได้รับความสนใจ อย่างไรก็ตามการระบบจัดการสินค้าประเภทนี้ยังไม่ถูกพัฒนาให้เหมาะสมกับลักษณะของสินค้าอย่างแท้จริง เป็นเหตุให้ ปัญหาสินค้าเกินความจำที่ต้องทิ้งไปในแต่ละวัน และการเสียโอกาสทางการขายจากปัญหาความไม่แม่นยำในการสั่งสินค้า

จากการสำรวจและการวิเคราะห์ปัญหาในปัจจุบันพบว่าของเสียที่เกิดจากการทิ้งสินค้าที่หมดอายุไปในแต่วันวันมีมูลค่าสูงมาก และเป็นปริมาณที่เกินกว่าบริษัทได้คาดไว้ ที่ร้อยละ10 ของยอดขายแต่ของเสียเกิดอยู่จริงที่ประมาณร้อยละ 16 โดยทั้งหมดเกิดจากกระบวนการทำงานในปัจจุบันที่ไม่เหมาะสม วัตถุประสงค์ของวิทยานิพนธ์ฉบับนี้จึงเป็นการเสนอกระบวนการจัดการสินค้าอาหารสดที่เหมาะสมเพื่อลดปัญหาดังที่กล่าวมา โดยการศึกษาปัญหาของกระบวนการทำงานในปัจจุบันและศึกษาจัดการสินค้าอายุสั้นที่ประสบความสำเร็จของร้านสะดวกซื้อในต่างประเทศ แล้วออกแบบกระบวนการที่เหมาะสมกับสภาวะทางธุรกิจในปัจจุบันของบริษัท ขอบเขตของวิทยานิพนธ์นี้เป็นการออกแบบแนวทางการทำงานรวมถึงกระบวนการทำงานพร้อมกับเทคโนโลยีที่จะมาสนับสนุนการทำงานเพื่อให้มีกระบวนการที่สามารถจัดการสินค้าประเภทนี้ได้อย่างมีประสิทธิภาพและอย่างเหมาะสม จากการศึกษาและออกแบบพบว่าแนวคิดที่เหมาะสมในการจัดการสินค้าประเภทนี้คือการให้อำนาจในการตัดสินใจโดยให้ข้อมูลสนับสนุนอย่างเพียงพอ รวมถึงการนำอุปกรณ์การสั่งแบบใหม่ที่สามารถช่วยให้ทำการตัดสินใจได้ดีขึ้นจากข้อมูลที่ง่ายต่อการวิเคราะห์ นอกจากนี้กระบวนการที่ ยึดเป้าหมายรวมของห่วงโซ่อุปทานโดยการร่วมมือกันของผู้เกี่ยวข้องทั้งหมดก็จะช่วยให้การทำงานเป็นไปอย่างมีประสิทธิภาพและมีต้นทุนที่ต่ำลงในระยะยาว

โดยผลลัพธ์ที่ได้จากการศึกษานี้จะเป็นแนวคิดและกระบวนการทำงานทั้งหมดที่เกี่ยวข้อง ผลจากการนำไปปฏิบัติงานจริงจะไม่รวมอยู่ในการศึกษานี้เนื่องจากเป็นการเปลี่ยนแปลงที่ต้องอาศัยการลงทุนสูงและใช้เวลายาวนานและการอนุมัติการผู้บริหารระดับสูง อย่างไรก็ตามจากการคาดการณ์โดยใช้ข้อมูลการทดลองในร้านนำร่องของสำนักงานใหญ่ที่ได้ควบคุมขั้นตอนการสั่งสินค้าภายใต้กระบวนการปัจจุบันให้เป็นไปอย่างถูกต้องพบว่าสามารถลดของเสียเฉลี่ยไปได้เป็นร้อยละ 4 จึงนำเอาผลการทดลองนี้มาเป็นเกณฑ์ประเมินขั้นต่ำในการประเมินอัตราของเสียที่จะลดลงหลังจากนำไปใช้งานจริง เมื่อรวมกับการแก้ปัญหาในจุดอื่นๆ คาดว่าของเสียโดยรวมจะลดลงเหลืออยู่ที่ประมาณ ร้อยละ 10 ของยอดขายจากปัจจุบันอยู่ที่ประมาณร้อยละ 16 ซึ่งคาดว่ากระบวนการทำงานที่ออกแบบไว้จะสามารถเป็นแนวทางการทำงานที่เหมาะสมสำหรับองค์กรที่จะนำไปปฏิบัติจริงในการจัดการสินค้ากลุ่มนี้ในอนาคต ให้มีสินค้าที่เหมาะสม ในร้านที่เป็นเป้าหมายอย่างแท้จริง และมีสินค้าพร้อมที่จะบริการลูกค้าอยู่เสมอ ภายใต้กระบวนการที่มีประสิทธิภาพและมีต้นทุนที่น้อยที่สุดเท่าทีเป็นไปได้

ศูนย์ระดับภูมิภาคทางวิศวกรรมระบบการผลิต

สาขาวิชาการจัดการทางวิศวกรรม ลายมือชื่อนิสิต.....

ปีการศึกษา 2554 ลายมือชื่อ อ.ที่ปรึกษาวิทยานิพนธ์หลัก.....

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From business competitiveness and constantly changing consumer behavior, leads to change of business practice to be conformed to current business context. Ready-to-eat product, which has short shelf life, is determined as a strategic product in order to differentiate from competitor and to satisfy customer's need. Gross profit of fresh product group is also significantly greater than grocery product, so fresh product deserves to be focused. However, the current management of fresh product is not developed to actually suit with product's characteristic. This leads to waste from excess product and opportunity loss from out of stock problems.

From investigation and analysis found that waste form write-off product is very high value and it over the expected value by company at 10% of sale. The current waste is approximately at 16% of sale which excesses the targeted waste. This problem is caused by inappropriate working processes. The objective of this thesis is to propose appropriate working process and managing approach in order to mitigate problems. The methodology of thesis is to access current problems and study successful models of fresh product management, then design the working process with required technology support which suits the product's characteristic. The result from designed process found that, the appropriate managing approach for fresh product group is empowering with sufficient supporting information. New ordering device also would enhance accuracy of decision from friendly information analysis interface. Moreover, the collaboration establishment would increase efficiency of operation and minimize costs from having same goals and objectives.

The deliverables from this study are the proposed working processes of fresh product management. The implementation result is not scoped in this study as it is a big change project which requires high investment, time and committee's approval. However, from pilot test implementation result by fully controlled ordering process by headquarter showed that waste was reduced approximately 4% of sale. So this result was implied conservatively as a minimum waste reduction rate from new ordering process. When including with other improvements in this study, the expected waste reduction rate would be approximate at 10% from current at 16% of sale. The author expects that this thesis study would be a practical procedure for organization to implement the fresh product management in future. In order to have appropriate working processes those conform to fresh product. Finally the proposed processes/concept would deliver to having right products at right store and always have availability of product to serve customer with an efficient operating system.

The Regional Centre for Manufacturing System Engineering

Field of Study: Engineering Management Student's Signature……..……

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List of Abbreviations

ASN:	Advance Shipping Notice
BDC:	Bakery Distribution Center
CDC/CDCs:	Chilled Distribution Center/Centers
DC/DCs:	Distribution Center/Centers
D/O:	Delivery Order
DSD:	Direct Store Deliveries
EDI:	Electronic Data Interchange
EOB:	Electronic Order Booking
F:	Forecast
GOT:	Graphic Ordering Terminal
HML:	High Medium Low
HQ:	Headquarter
ISDN:	Integrated Services Digital Network
I:	Inventory
IT:	Information Technology
O:	Order
OFC:	Operation Field Counselor
P/L:	Picking List
P/O:	Purchase Order
POS:	Point Of Sale
RDC/RDCs:	Regional Distribution Center/Centers
RFID:	Radio Frequency Identification
SC:	Store Controller
SCM:	Supply Chain Management
SEJ:	Seven-Eleven Japan
S/I:	Shipping Instruction
SKU/SKUs:	Stock Keeping Unit/Units
ST:	Scanner Terminal
SRM:	Supplier Relationship Management

CHAPTER I

INTRODUCTION

1.1 Background

Retail industry is the part of economic activities that is the contact point with the end customers. The major goal of retail industry is to merchandise products for customers. Convenience store is also a part of retail industry. Convenience refers to easiness and availability, therefore the location of convenience store should be easily accessed for the customers. Convenience store has unique management system due to small store size and large number of store which expanded in all part. It needs flexible system to manage high moving sales product with limited store sale area.

Efficient supply chain management is the key factor for convenience store industry. The author uses a case study of convenience store on fresh product category to analyze and develop the appropriate working processes/concepts in order to deliver efficient supply chain managing. The author uses a case study of ABC Company focusing on fresh product category to analyze and develop the appropriate working processes/concepts.

Current factors such as, new strong competitors, rising operation costs, and changes of customer's demand, lead the firm to focus more on fresh product category. This product category has had significant potential for several years ago and became more focused by management team in order to differentiate from competitive grocery product market. According to top management of ABC company interview (2010), ABC Company tried to positioning itself as "Convenience Food Store" instead of "Convenience Store". Food is their key product category that they try to increase

fraction. Gross profit of fresh food product group also significantly much than grocery product which approximately 30% and 10 % respectively. Ready-to-Eat products deliver convenience to customer in term of fastness of heating with better taste than frozen food at similar price.

Figure 1.1: Tesco Lotus Express (Competitor of Convenience Store Industry)

1.2 Statement of the Problems

As described above that business strategy of the firm is tending to be "Convenience Food Store" that has variety of Ready-to-Eat product category. They try to increase fraction of food products, accordingly they try to reduce grocery product's fraction which has less gross profit than food product category. However, originally ABC Company has managed product based on grocery product characteristic since establishment of operations. Totally operation concepts, processes and facilities support long shelf life product.

The concepts of managing fresh product differ greatly to those of general grocery product due to very short product lifetime. Many current processes of fresh product managing rely on long life product processes, which do not fully support fresh product's characteristics. This could lead to two basic problems: "Excess Inventory" and "Product out of Stock". "Excess inventory" is caused by overestimation of order. This problem leads to waste from products that have to be

thrown away each day. On the other hand, “Product out of stock” is a problem caused by underestimation of order. Basically, the opportunity loss of sale is an effect from out of stock problem. Furthermore, customer may be disappointed and change their shopping place because of bad experience. Both suggested problems need to be solved by all related functions in supply chain.

Figure 1.2: Example of “Ready to eat” or “Chilled Food” Product

In term of waste from excess inventory, the best data to be analyzed is write-off data from all stores. All disposal products have to be recorded by store for store’s account balancing. Below are the detailed disposal products worth of January and February 2011.

Write-off worth (per month)	January 2011 (Baht)	Percentage	February 2011(Baht)	Percentage
Fresh product shelf life 3-6 days	-29,879,699.00	28%	-28,391,591.00	29%
Fresh product shelf life 7-21 days	-67,652,000.00	64%	-58,127,102.25	60%
Others	-8,390,293.75	8%	-10,920,675.75	11%
Total	-105,921,992.75	100%	-97,439,369.00	100%

Table 1.1: Waste from Wirte-off Product Data

As can be seen from table, fresh product groups (included both short and long shelf life) are almost of the total waste (about 90%). Short shelf life fresh product (3-

6days shelf life) brought about 28-29% or about 28 million to 30 million baht per month. 60 to 64 percent of waste is caused by long life fresh product which values approximately 58 million to 67 million baht per month. For other products, there were only approximately 10percent of total waste.

Currently average waste worth of 3-6 days life time product is approximately 16-17% of total sale which is greater than the firm's expected allowance rate at 10%. There is about 10% of waste over the expected allowance rate which is about 15 million baht per month or about 180 million baht per year. According to the waste information from 2 months, this could approximate that unnecessary waste from product disposal especially from fresh products (both short and long life time) is over one billion baht per year. This could be assumed that waste from overestimation really serious problem. This waste could cause by inappropriate managements and working processes along all related functions.

There are three major internal functions and one external party related to supply chain system of fresh product as suggested in the figure 1.3.

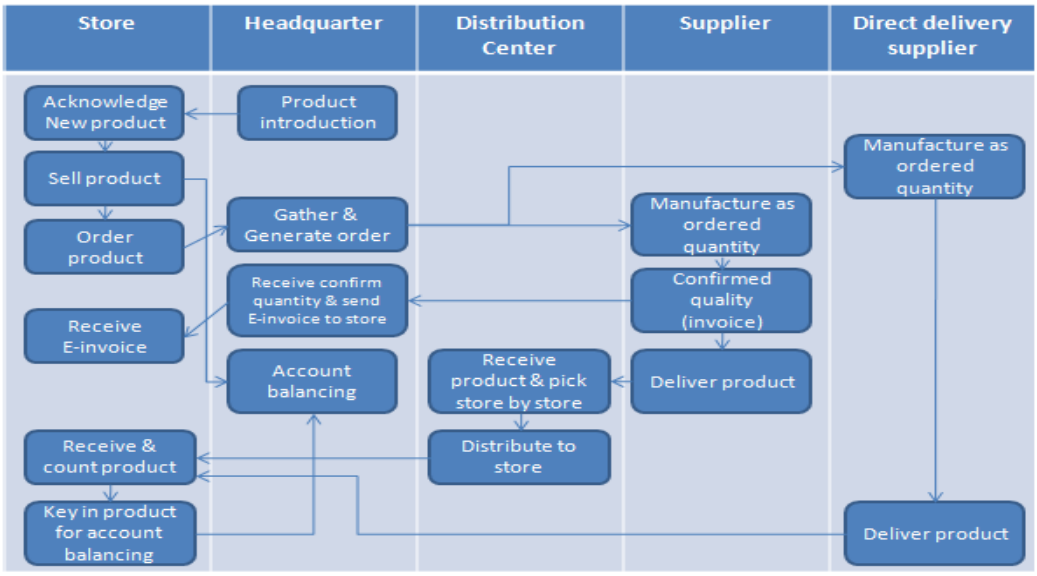


Figure 1.3: Major Related Functions in Fresh Product Supply Chain

1.2.1 Merchandise

The first major internal function is merchandise. This function's duties are to source new products and introduce to nationwide stores. They also have to eliminate slow moving sale products from stores. Current working concept of merchandise is based on nationwide product introduction, which may not be suitable to the current business context. Original working style of merchandise department is to introduce all products to all store because all management is centralized at headquarter and there are small number of stores. However, currently, increasing number of stores around the country requires different management style. The current context is totally different from those of the past.

Currently, chilled lunch box products are available only in Bangkok and greater area which coverage about 1,300 stores. Every store, that was decided to sell these products, has to carry and order every SKUs (about 100 SKUs) and must always available at store. This is the current regulation to control store's quality which causes by merchandise policy that wants to promote every product in category. Store cannot delete any products from store even some items have low sale performance. From investigation, some product in this category is match with some stores but may not be suitable for some stores. The unsuitable product is cause of waste and affect negatively for individual store. The product introduction concept may causes waste in supply chain.

1.2.2 Distribution Center

Next function is the distribution center. The main responsibility is to deliver products which stores ordered. There are two major types of warehouses classified by temperature controlling and product life and ordering cycle.

First type of warehouse is called Distribution Center (DC). DC is the warehouse that stocks products at ambient temperature. The products that have long product life such as snack, water and others that have product life of more than one month and are able to be kept in ambient temperature, will be classified to be stored in DC. The delivery frequency of DC is 3 times per week per store. The deliver method of DC was divided into two types which are “full case” and “break case”. “Full case” type is to deliver the products with full packaging or box, while “break case” is to unpack the products then mix many products into the case.

Another type of warehouse is called Chill Distribution Center (CDC). CDC delivers products that have short shelf life such as fresh food, milk, and sausage. The temperature in CDC is controlled at 5 degree Celsius. There is no inventory in CDC because the products are delivered to the stores daily with cross docking system. The products that are delivered to CDC will be separated into plastic cases then delivered to stores immediately. There is also another delivery method, which suppliers directly deliver products to stores.

Current situation of fresh product delivery has many methods and is quite complicated. Some fresh food product categories are sent to stores by CDC. Some fresh food product categories are sent directly by supplier. Bakery product group is sent by its own distribution center called BDC (Bakery Distribution Center). Although it has similar product group and same order cycle, the delivery method is still complicated and has redundant routes. Cut off ordering time also different even similar product category. These problems could be implied that many resources in this firm are not fully utilized and can be improved to reduce waste in supply chain.

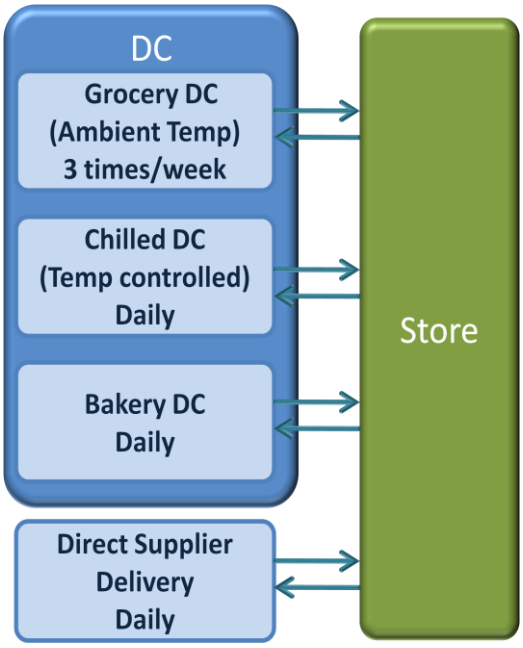


Figure 1.4: Current Types of Distribution

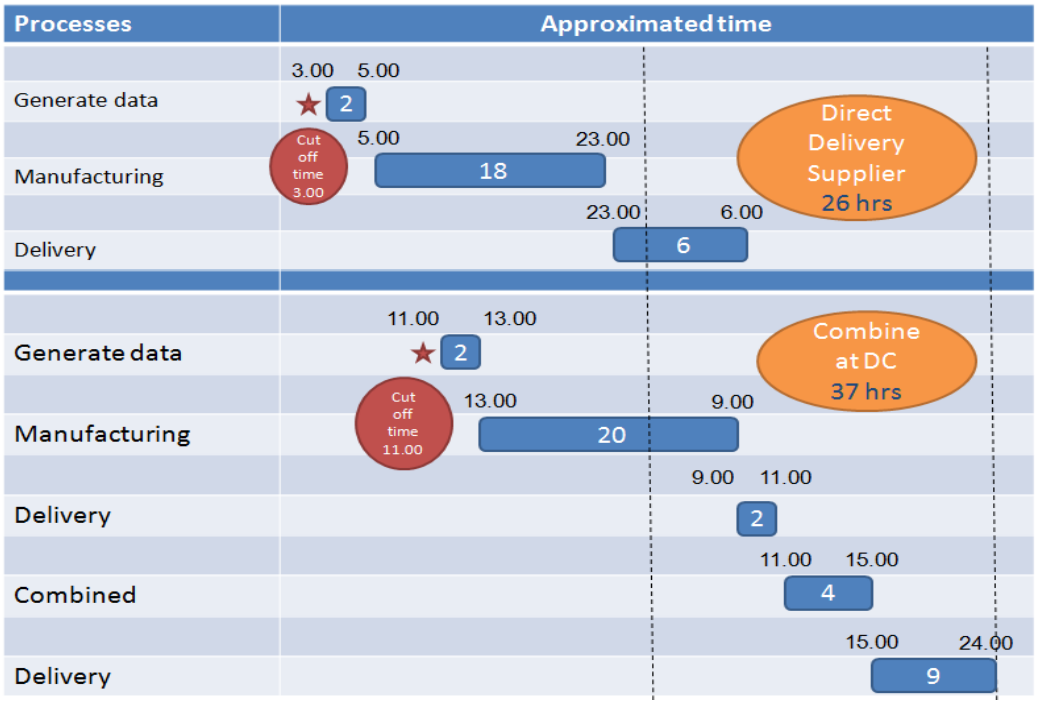


Figure1.5: Approximated Lead Time of Direct Supplier Delivery and Delivery by CDC

1.2.3 Store

Store function could be the most important function for convenience store industry's supply chain because this function involves a great number of store staffs. Stores are also the closest function with the end customers and have to determine the order (demand that other support functions have to respond). The major responsibilities are product ordering, selling, product receiving, and in-store management. Due to limited skill of staff and plenty of activities, the standard working process should be user-friendly, especially for fresh product ordering processes.

However, the current working processes of fresh product ordering are quite complicated and are redundant. Because the current ordering system was implemented nearly 20 years ago, the foundation of processes/system mainly support the grocery products or long shelf life products. Fresh product ordering processes/system has to rely on grocery product ordering system that leads to many drawbacks. Fresh product ordering needs a lot of supported information because they have very short shelf life. The existing processes/system does not support the management of fresh product. They have to order fresh products by ordering handheld. This tool is a mobile device for in-store product ordering. The physical of handheld has limited size of screen; accordingly the information for fresh product ordering is limited. These constrain may cause waste in supply chain. Store may order product too much or too little because of lack of enough supporting information. Right now there is the solution for store to order fresh product with more information, which deliver order sheet template with some information from headquarter. Store has to fill in sale and other information to complete information support field. This approach could help store to have better information for ordering but it comes with

complicated processes, not user-friendly and takes longer time. Stores have to manually fill in sale, write off and weather data into order sheet, then decide and determine order quantity in worksheet. Finally, they have to key the product order quantity at the back office computer, and then push the order to headquarter. These processes may be implied as inappropriate process, which are waste in supply chain.

There are 3 majors related working processes on fresh product management which are

1.) Fresh Product Ordering Process (bi-monthly processes)

a.) Prepare Order Sheet

Store staffs have print out the order sheet from and print out product information in piece of paper which called plan-o-gram. Then attach the plan-o-gram to order sheet sequence by product display position from left to right and top to down.

b.) HML Evaluation Process

HML are standing for high, medium and Low. These are the index that use for suggest store staffs for fresh product ordering. There are 3 factors that influence this index which are

- Customer visiting history (30%): The amount of customer on the same day of last year, last month, last week. Total index are weighted as 30% of HML Index
- Weather (20%): this is the forecasting information that has to be recorded by store staffs. Same weather may influence on sale differently depend on individual store
- Event (50%): This is the most impact factor for sales of product. Store staffs also have to maintain and weight the factor for individual event.

c.) Rank product in Pareto from

Store staffs print out sale history of products and sequence the sale rank to determine rand A, B, C for individual product manually and write down into order sheet.

d.) Shelf display and register shelf position of products

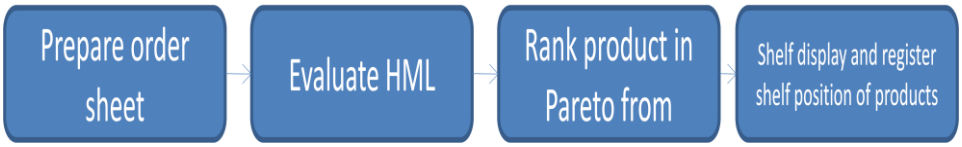


Figure 1.6: Bi-monthly Ordering Working Process

2.) Fresh Product Ordering Process (daily processes)

a.) Write down history sale data

Due to ordering process is operated manually on order sheet, sale data have to be daily recorded into order sheet. This data will help staff to analyze sale trend of individual product.

b.) Count inventory of products

Before ordering process, staffs have to count the product inventory on shelf. There are 2 types of inventory which are the product that can be sale on next day and the product that have to disposal in that night. Due to fresh products have vary shelf life (3-6 days), there are 2 groups of product that have to be count separately. This affect on ordering formula (F-I=O) which “I” is the product which can be sale on next day.

c.) Order products

After fill all required data, store staffs start to order product according to the sequenced order sheet item by item. Store staffs have to analyze all information filed

and write down the order in order sheet. The formula for ordering is F-I=O. “F” is the forecasting quantity for sale on that day. “I” is the inventory that can be sale on next day which not included the product which will expire in that night. “O” is the actual quantity that will be placed for ordering.

d.) Scan barcode and key in order quantity

After order all products, store staffs have to scan the product barcode on order sheet then place the ordered quantity into ordering handheld item by item since complete all items.

e.) Sync ordered data to store computer to be ready to send to headquarter.

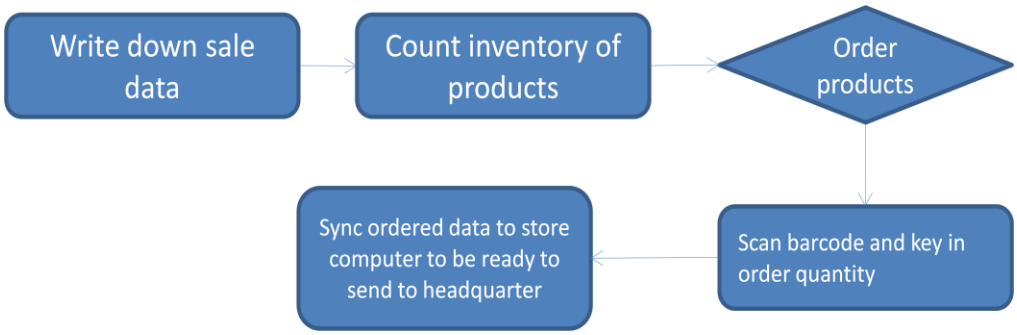


Figure 1.7: Daily Ordering Process

Ordering Processes	Bi-monthly activities	Daily activities
Prepare order sheet	210 min	
Evaluate HML	5 min	
Evaluate ABC Rank and write down information	15 min	
Shelf display and register	47 min	
Count inventory product		29 min
Order product		34 min
Scan barcode and key in order quantity		12 min
Sync ordered data to store computer		7 min
Summary average lead time	277 min	82 min

Table1.2: Average Lead Time of Current Ordering Process

3.) Product Receiving Process

a.) Verify store number and store name in invoice

b.) Verify date of delivery in invoice

c.) Physical count and verify product quality then compare with invoice with distributor

d.) Issues credit note for distributor (if any)

e.) Stamp running number, store name and sign name in invoice for distributor

f.) Select invoice no in store computer that match with the delivered supplier.

The above processes are for the products that were sent by CDC. For direct delivery from supplier, the receiving process is different. Store staffs have to key in product into store computer item by item.

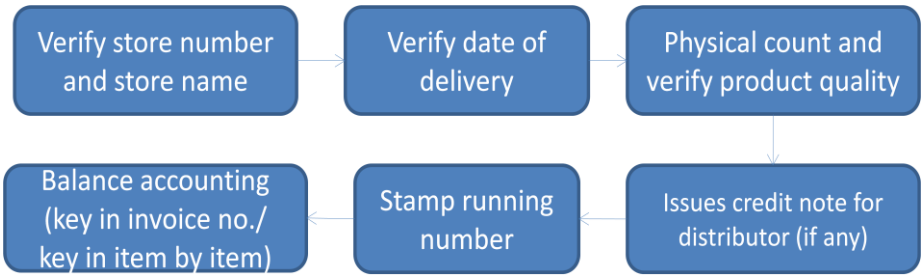


Figure 1.8: Product Receiving Process

4.) Write off Product Process

a.) Count the products that will expire tomorrow

b.) Separate product from shelf and throw away

c.) Write down product codes and amount in paper sheet

d.) Key in the write off product in store computer

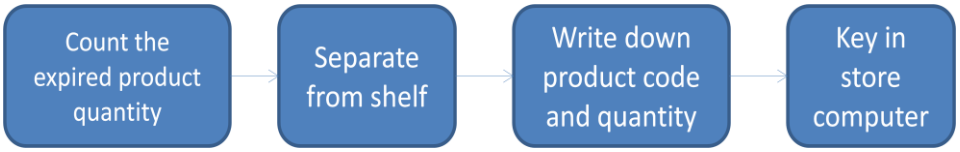


Figure 1.9: Writing-off Product Process

1.2.4 Integration Information System

Lastly, the foundation of all functions in supply chain is "integration information system". The integration information is one of the critical areas for modern supply chain management. 7-eleven have a centralize information system center to command all ordering processes and information transferring. Starting with the store staffs determine their order from stores. All ordering information was pulled to HQ to be processed. First type of ordering will be sent to DC to check the real time inventory level. DC will process to pick the product and deliver to stores. For CDC, information will deliver to CDC and CDC suppliers. CDC suppliers have to produce their products and send to CDC while CDC will receive information in order to allocate the capacity and picking list for each store.

This seems to be an ideal model of supply chain, but the problem is that all information pulling or pushing systems are operated partially. Order data from stores will be sent to headquarter only twice per day. Sales information and others will be collected and send to headquarter once per day. There is limited information usage between stores, DC, headquarter and supplier. Suppliers are not allowed to access sale information. Order data is the only one available data that they receive from the firm. The Current situation may not suit with fresh products because lead time is the key factor. Lead time can be shortening by initiating information sharing along the supply chain. There are some waiting times in current process which can be improved by enhancing information sharing.

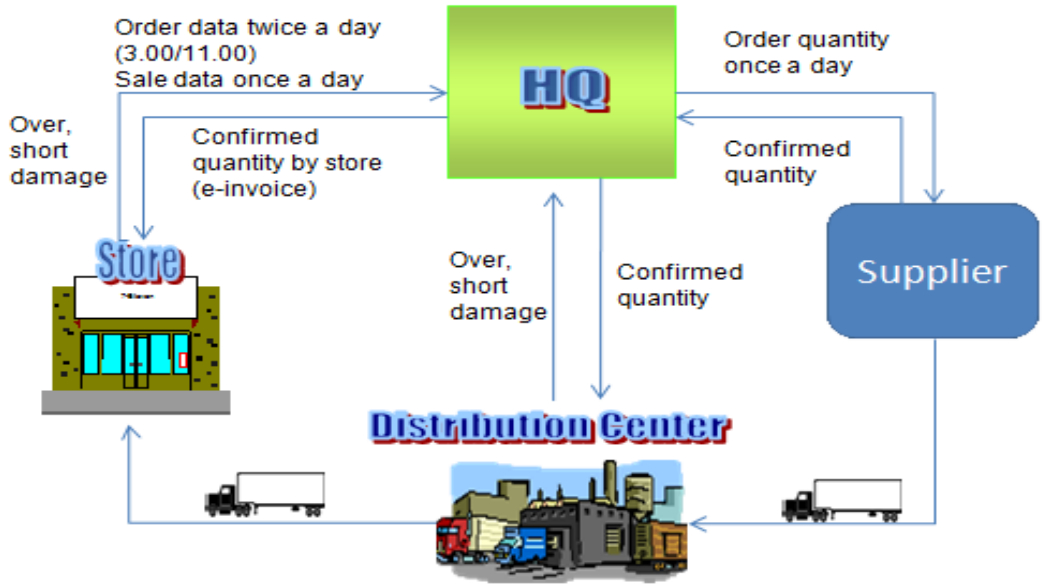


Figure 1.10: Integrated Information System

1.3 Objective of Thesis

- To design business processes & required technology that align with business direction/current context and suit with the fresh product's characteristics
- To propose approach which reduce waste and non-value added activities of fresh product supply chain. .

1.4 Scope of Thesis

The focus of this research will be on all important processes related to or have affects on fresh product's supply chain. The scope will be focused on store, logistic, headquarter, supplier and integrated information system to develop efficient supply chain. This research will emphasize "store working process" which is the most impact function and is related with lot of staff. For the logistics, headquarter supplier functions and integrated information system, would the detailed working process would not be defined. Working concepts and business models are the deliverable for

these functions (Logistic, Headquarter, Supplier and integrated information system) due to the high complexity and very detailed working process. The deliverables would be working processes and concepts that lead to efficient supply chain in organization. Implementation result is not included in this research.

1.5 Expected Benefits

From this study, the deliverables are the suggested business processes and required technology that appropriate with fresh product characteristic. These will benefit both the end customers and the corporate. The expected benefits are as follows:

- Improved working process with less workload and lead time
- Improved information sharing processes between all related functions
- Reduce waste from excess product
- Developed supplier relationship

The required investments from this research are:

- New ordering tool
- Supporting IT tools
- New Information system

The rough estimated investments costs are:

Required investment	Approximated Cost	Approximated unit	Total
New ordering tool	15,000	5,500	82,500,000
Supporting IT tool	3000	5,500	16,500,000
New information system	30,000,000	1	30,000,000
Approximation investment			**129,000,000**

Table 1.3: Rough Approximated Investment Cost

1.6 Research Procedure

1.) Study corporate strategy and existing current working processes & concepts

- Business direction ,Short & Long term objective
- Vision & Mission, Business strategy
- Store operations
- Logistic systems
- Headquarter operations
- Supplier

2.) Study the literature review the models of fresh product's supply chain management from other sources or successful companies in this specific area.

- General published model (Text books and journals)
- SEJ (Seven Eleven Japan)
- Wal-Mart

3.) Design the working models, concepts and detailed processes of fresh product supply chain

- Store operations
- Logistic systems
- Headquarter operations
- Integrated information system

4.) Summarize the new designed processes with the current working processes

5.) Write up thesis

6.) Thesis examination

CHAPTER II

LITERATURE REVIEW

The literature review of the thesis proposal about fresh product management system will be covering the following aspects:

- Supply Chain Management
- Lean Supply Management
- Seven Eleven Japan (SEJ) on Fresh product supply chain
- Supplier relationship management case between Wal-Mart and P&G

2.1 Supply Chain Management

In this research, supply chain management will be studied to understand the key elements and objectives of supply chain management. The broad concept of supply chain is to integrate the processes of various business entities together. Supply chain management is the integration of key elements in the manufacturing/supply chain from raw material through to the end user in order to enhance the competitive advantage. Basically, supply chain management focuses on the efficiency of processes such as manufacturing, transportation and distribution. To be more specific, the general objectives of supply chain management are to reduce lead time, reduce inventory level (ideally at optimal level), accuracy forecasting, reduce total costs and satisfy customer's demand.

Generally, supply chain's objective of retail business is to deliver the right product at the time to the right place in the right cost.

Right Product: to have the right products, define what the suitable processes are for headquarter to operate and what necessary information is needed for decision.

In the same way, define the working processes and required information for store operation level.

Right time: to deliver product at the right time, define what the appropriate range of time for delivery, what is appropriate delivery cycle to satisfy consumer's behaviors.

Right Place: to have product at the place, define the process of headquarter to suggest the product to the right store and the processes of store level to place individual product at the appropriate position and volume on product shelf.

Right Cost: to have the least operation cost as possible by applying lean concept along supply chain to eliminate wasted for lower cost.

2.2 Lean Supply Management

According to background and statement of problems, the current processes of fresh product management system have many waste processes in chain; therefore there are opportunities to improve. Lean supply management is also another important topic to be concerned for this thesis. The objective of lean supply management is to improve processes continuously in order to eliminate waste or non-value added activities in the chain. The concept is to optimize every resource in chain in order to provide value to the customers. According to Abbott J., Manrodt K.B. and Vitasek K. (2000), there are six key attributes that lead to lean supply chain.

2.2.1 Improved Demand Management

One of the key principles of Lean is Pull system. For this case, product demand is pulled by order from stores. The exact demand form end customer is impossible to be determined especially for retail business nature. The demand comes

from the estimation of store staff therefore the sale data from point of sale is one of the key elements for demand forecasting. This information also needs to be conveyed upstream to all related functions and converted into any useful form for individual function. The “real time” information pulling could be the key for enhancing efficient of fresh product supply chain.

2.2.2 Waste and Cost Reduction

The seven wastes is a tool that will be used to categorize waste to eliminate waste in supply chain. The seven wastes consist of:

1.) Over production

Overproduction is to manufacture before actual requirement. Overproduction will effect negatively on cost of production. It would effect on flow of material, production scheduling and excessive end-product inventory. Lastly, it will bring high carrying cost. In this case, the over production is more harmful than inventory cost because store have to disposal over much product due to short shelf life constrain.

2.) Waiting

Waiting will occur when the upstream activities doesn’t deliver on time. So the downstream activity cannot process or move further. This is the waste that caused by poor material flow or production planning.

3.) Inefficient Transporting

Transporting product from process to next process was implied as an unnecessary movement. Too much movement may cause product damaging. Practically, transportation is impossible to be eliminated however it possible to be reduced to have least possible movement in supply chain.

4.) Inappropriate Processing

This term refers to extra operations such as rework, reprocessing, use expensive equipment to process simple operation and poor plant layout. All of these reasons lead to higher overall operation cost. The examples of ways to eliminate waste are to use automation, replace old machine with the more efficiency one and redesign plant layout to be more appropriate.

5.) Unnecessary Inventory

Inventory is an essential element in business. Every firm must have inventory to deliver to their customer. The traditional concept may not concern much on high inventory level in their company. For Lean concept, the excess inventory is the waste and non value added that can be eliminated by lean approach. Inventory would bring many following cost such as operation cost, cost of inventory and carrying cost.

6.) Unnecessary Motion

This waste is related to ergonomics in process such as bending, stretching, walking, lifting and reaching. Health and safety issues are also included. The excessive motion is the waste and should be analyzed to eliminate or improve.

7.) Defects

Defects are the products or services that do not meet the specification or customer's expectation. These causes reworking and scrap that are waste and add cost to organization. The re-inspection, rescheduling and capacity loss are the following cost from defects. The continuous process improvement is the way to reduce defect from production.

Figure 2.1: Seven wastes in supply chain

(Source: http://www.thaitextile.org/tdc/?page_id=429)

2.2.3 Process Standardization

The third attribute of lean supply chain is process standardization. The benefit from standardization is reducing complexity. The process standardization development is to look across the structures of functions and connects activities in the stream. By focusing on overall flow or total system efficiency not only on individual efficiency, the efficiency can be gained by collaboration and by developing standardized process.

2.2.4 Industry Standards Adoption

"Industry standards adoption" is not directly related with food supply chain but it not limited only on the physical standard of product, it can also dictate how information is shared across the supply chain. Information sharing has to be concerned to standardize. As increase the amount of data accordingly with business growth, there is risk of digital waste. Digital waste is defined as information that is not related to the defined goals. This is worthless to organization and could lead to congestion of information.

2.2.5 Cultural Change Agent

Lean management has to be applied by people. It needs collaboration by all functions in chain. It has to change the existing process that has been doing for a long time. This could be a major problem of lean management applying. Lean concept deployment has to emphasize employee development because it needed collaboration from people in organization. The approach to change can be through meeting, discussion, information exchange, continuous improvement and culture change program in order to persuade to implement new way instead the old way which is one of the biggest challenge in Lean initiate.

2.2.6 Cross-Enterprise Collaboration

In lean supply chain, functional oriented is not the way to work, cross-enterprise collaboration is one of the keys of lean management. Supply chain partners should focus to develop relationship to work as a same team in order to accomplish same objective which is to maximize the added value provided to the customer.

2.3 Seven Eleven Japan (SEJ) on Fresh Product Supply Chain

To be more specific, Seven Eleven Japan could be the best case to be studied for this research because SEJ is the most the successful and the largest convenience store firm in the world. They have an excellence system from continuous improvement. The study would help the researcher to understand supply chain strategic which fit in convenience store industry.

2.3.1 Distribution System of SEJ

Distribution system is one of the keys for convenience store business. 7-Eleven Japan has had high flexibility distribution system that can deliver product to

store rapidly. SEJ combine all suppliers and deliver to store at the same time with reduce the number of delivery at store. The benefits are cost saving and efficient store operation. The method the SEJ use for selecting new stores called “Area dominance strategy”. The purpose of this method is to maximize efficiency of distribution. The approach of this method is to open new store specific area. New opening store must be in the limited radius or distance form regional distribution center. These approaches deliver high flexibility in distribution, short lead time and high efficient. SEJ can deliver rice box which called “Bento” to store three times a day. This product can generate large revenue for SEJ and it is the strategic product of SEJ.

They also have temperature-based joint delivery system, which mean that the product that required same temperature zone would be combined and delivered to store in single truck. There are 4 temperature zones as seen in below figure.

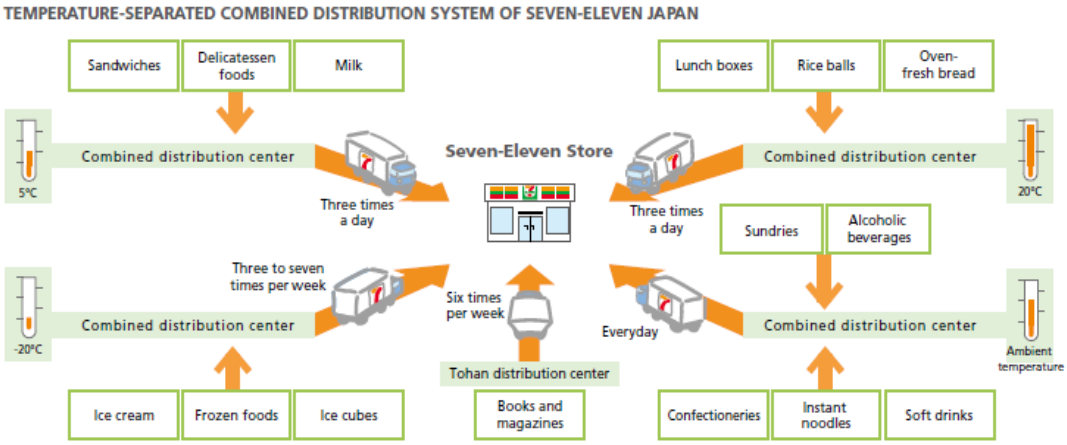


Figure 2.2: Temperature-separated Combined Distribution System of Seven-eleven Japan (source: Seven eleven Japan “Corporate outline 2009”)

2.3.2 Information System of SEJ

Information system of SEJ is the foundation for all functions to support the decision process. It is very important tool for SEJ to closely connect to customer. Due

to the limited store size, the information system is extremely important for product ordering and decision. It is also important to prevent problems of out of stock and excess inventory. The information system of SEJ integrates all elements in store, headquarter, distribution center and suppliers together. Product sale information from POS (Point of sale) is sent to headquarter via network on real-time basis. Headquarter can process data from store and send order information to manufacturer/wholesalers and distribution center. The information is also sent to Operation field counselors (OFC) who has responsibility to recommend general management to stores. The excellence information system can help OFC to feedback the recommendation to store immediately. Other information from headquarter is also provided to stores to support product ordering/sourcing. Product information, picture, video, weather forecast information promotion and others are sent to store via this network. The integrated information system also benefits collaboration between SEJ and business partner. The integrated information system creates value-added information for suppliers, product development and store operations.

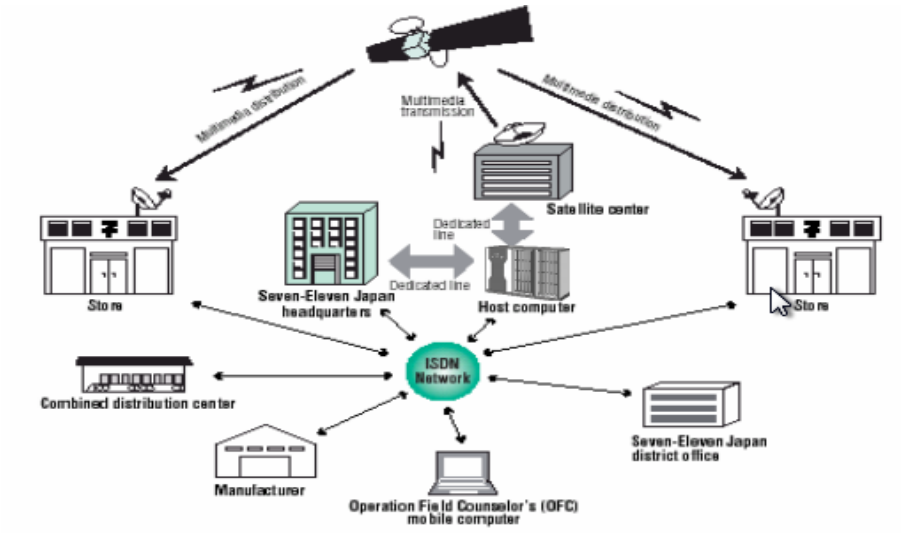


Figure 2.3: SEJ's Fifth-Generation Total Information System Network

(Source: http://intranet.weatherhead.case.edu)

2.3.3 SEJ's Merchandising

Due to the limited store size in Japan which is totally different from store in USA, the strategy to manage products is also different. The limited store size and rapidly demand change in Japan is similar to 7-eleven in Thailand. The strategies of SEJ on product merchandising are rapidly supplying new products in high demand and eliminate slow moving products base on item-by-item analysis. This analysis helps SEJ to have high supply efficiency. The demand of people became more fashionable; therefore quick respond to the market is the key for SEJ merchandising. SEJ Merchandiser catches up their product base on item-by-item rather than product category.

2.3.4 SEJ's Store Operations

SEJ facilitates many tools for store to work. For ordering process, SEJ provide the hand-held computer for ordering process. Store staff can walk to the shelf and input order in this device. They also can check stock, past sale on the screen while placing orders. Then the order will send to Store Computer (SC) and transfer data to headquarter for further processing. Ordering fresh food items are place three times a day. Point of Sale (POS) data is basis information for ordering however other factors like weather and event have effect in product sale. The hand held device that used for fresh product ordering called Graphic Ordering Terminal (GOT). The physical of GOT like tablet PC that have big screen size. The benefit of GOT is it can show all necessary information for ordering in both numerical and graphical form. Hourly sale trend, scrap trend, stock level, stock out ranking, weather forecast event and more are

the necessary information for fresh product ordering. GOT also easy operate and information transferring by wireless connecting to store computer (SC)

The supporting tools for SEJ store are:

1.) Store Computer (SC) is the center of store information system. It connects to all tools in store and transfer data to Headquarter.
2.) Point of Sale (POS) is the tool for selling product. All sold product data will be collected and send to SC
3.) Scanner Terminals (ST) are the tools that use for product receiving. All delivered product have to be scanned and send to SC for inventory balancing.
4.) Graphic ordering terminal (GOT) is the tools for placing order the necessary information from POS and HQ will be shown on screen for ordering decision.

2.4 Model of Supplier Relationship Management between Wal-mart and P&G

One of the perfect firms to be explored in supply chain management especially in term of supplier relationship management case is Wal-Marts. Wal-Mart is the largest retailer in the world. According to Jonathan Byrnes article, over past decade, Wal-Mart has famously invited its major suppliers to jointly develop powerful supply chain partnerships. These are designed to increase product flow efficiency, consequently and Wal-Mart's profitability. Many supplier companies started to do alliance with Wal-Mart in many functions which are sale/marketing distribution/supply chain management, IT and finance. The objective is to maximize profit. According to Michel Green, There are 3 key factors for Wal-Mart to develop supplier relationship which are

- Working with manufacturers to get them to cut their costs as much as possible
- Working on its supply chain from those manufacturers to Wal-Mart's distribution centers, to make it as low-cost and friction-less as possible
- Improving Wal-Mart's information systems, so it knew exactly what its customers were buying, so the shelves would always be stocked with right items at the right time.

Wal-Mart and P&G set up team to work together in order to create the working partnership together to work more closely. Two companies decide to use same scorecard to be reviewed and used to drive category growth for both organization. They also use technology to drive out cost, share information openly. The strong commitment between 2 firms stated that "The mission of the Wal-Mart/P&G Business team is to achieve the long-term business objectives of both companies by building a total system partnership that leads our respective companies and industries to better serve our mutual customer - the consumer."

There many areas that both firms had developed together. Te detail will be explored below:

2.4.1 Information Partnership

Information is an important area the lead to successful of to be partnership. The aim is to link data of P&G's data with Wal-Mart's data in order to understand the customer's needs more clearly. They jointly develop the data highway to link both data center together to share each other information.

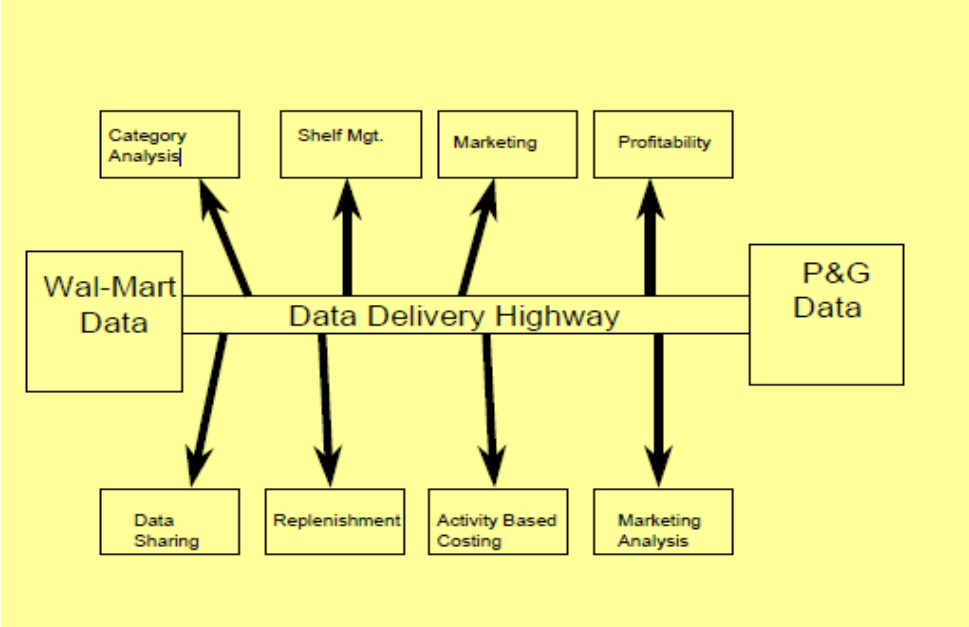


Figure 2.4: The Data Highway between Wal-Mart and P&G

(Source: http://citebm.business.illinois.edu/IT_cases/Graen-Shaw-PG.pdf)

Wal-Mart collects data from every store then they track, measure and analyze it while P&G also had data about consumer used for product decision making. The preference information of customer from P&G will be combined with the information regarding what was happening in store from Wal-Mart to input in Data highway for sharing. This data highway is a foundation infrastructure to support other relationship operations such as joint business scorecard, Order Replenishment, Electronic Data Interchange (EDI) and managing product by category.

2.4.2 Using Same Balanced Scorecard

Using same scorecard to report, tracking, evaluate margin & profit, inventory manage inventory and evaluate financial, this would help both firms have same standard to manage and have same objectives to accomplish. This is common strategic to be partnership to focus on end customer

2.4.3 Order Replenishment/Inventory Management

The important strategy to smooth supply chain is to have continuous order replenishment in order to reduce excess inventory and eliminate out of stock problem. The information transferring is one of the critical areas for modern supply chain management. Information sharing supports managing of inventory, ordering frequency, order quantity, etc. The replenishment from P&G product is based on inventory data from Wal-Mart Distribution center. P&G was authorized to manage the inventory level of their products in Wal-Mart's Distribution Center to ensure that P&G products will be in stock all times. P&G can change the order cycle and replenishment process to be aligned with Wal-Mart inventory. This process can reduce inventory dramatically which lead to increase inventory turn. This process also can help to manage the fluctuate demand which called "bull whip effect". The three major information that were used for replenishment processes are actual on hand inventory, on order quantity (not be delivered yet) and projected sales from stores. This would help P&G can manage their product more accurately than forecasting with the limited information/data.

2.4.4 Using Technology to Support Partnership

The role of technology in supply chain or relationship management is the critical tool to integrate information of each firm together. Electronic Data Interchange (EDI) is the system that was used to communicate the key business information such as Purchase order, invoice, advanced shipping notice and payment. This data transmission will simplify the daily process to be easier, more efficient, more accurate, faster and cheaper (in long term). This system also helps to reduce

huge number of problem, but if, the problem occur, the can solve it easily because the use the same system to operate daily business.

To be more advanced, the latest technology, Radio-frequency Identification (RFID), was used enhance the efficiency of relationship development. RFID Technology has offered significant improvements over barcode system, Paul Fox, a spokesman of P&G global operations said. They can track the product moving, distribution and other automatically. These also improve the accuracy and speed at point of sale at store. These benefits all related elements in supply chain. Customer will get better and faster services while Wal-Mart and Suppliers can track real time information in each process automatically for further analysis. However, the barrier is RFID technology is more expensive than barcode technology but if it was used widely, the cost per unit will cheaper.

2.4.5 Category Management

Technologies seem to be the important element in relationship development. However the human relationship still important element in Supplier relationship management. Technology can inform only data and information but the decision has to be relied on human. There are three integrated data in picture 9 that used for decision making. Customer data from retailer, consumer data manufacturer and market data third party will be integrated together for decision making. They shared information together to make appropriate decision such as eliminating low potential items, develop the product the meet customer's demand.

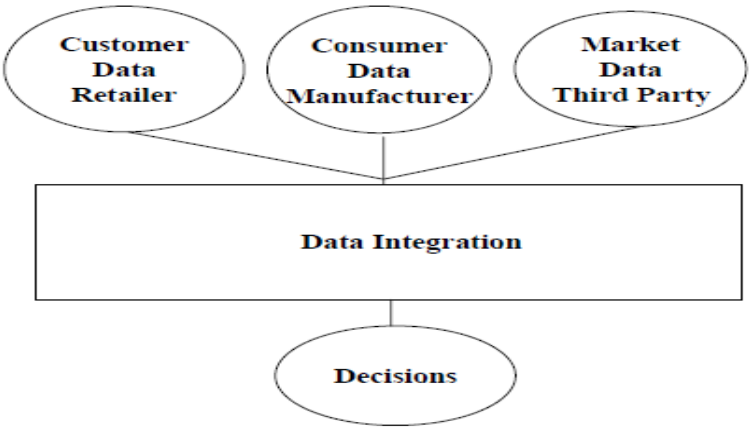


Figure 2.5: Category Management(Source: http://citebm.business.illinois.edu/)

The final picture that illustrates before and after relationship implementation between P&G and Wal-Mart is figure 10, 11 accordingly. They adjusted the organization, working process, implement technology infrastructure and others to be aligned to work together for long term relationship.

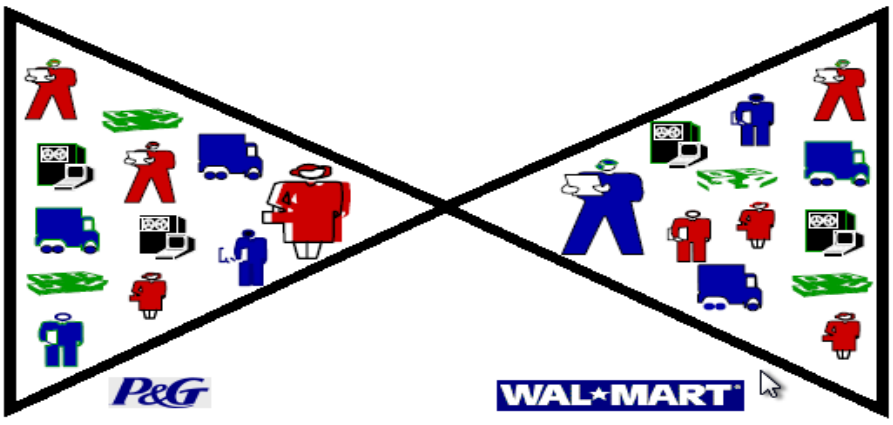


Figure 2.6: Relationship Before to be Partnership between Wal-Mart and P&G (Source: http://citebm.business.illinois.edu/IT_cases/Graen-Shaw-PG.pdf)

Figure 2.7: Relationship after Implement Partnership Between Wal-Mart and P&G

(Source: http://citebm.business.illinois.edu/IT_cases/Graen-Shaw-PG.pdf)

CHAPTER III

CURRENT SITUATION AND PROBLEM ANALYSIS

3.1 Current Driving Factors to Change/Improve Fresh Product Management

"Change is a way of life for all organizations. New or improved services are delivered, new processes are introduced, supplier relationships change, organization merge and divide in response to political or market forces. Organization strive to achieve excellence by improving practices and services, to be better prepares for the future, to make innovation possible and to encourage new ways of thinking about doing business" (Alan Harpham, 2002) For ABC Company case, there are many reasons why this organization's strategy need to be changed. The current working processes and supporting technologies were implemented more than 10 years ago. Most of working process and technologies need to be changed in order to support future business direction and strategy for survival in this industry. There are many factors that drive organization to change their working processes and concepts. Below are the current contexts in different aspects that drive organization to change.

3.1.1 Business Competitive

Though ABC Company is the greatest convenience store in Thailand in term of No. of chain store, there is new competitor in market that become more and more powerful. The most important competitor, which is Lotus, has an advantage on lower pricing because there gain benefit from high volume negotiation. Due to the basal business of Lotus is megastore so they have more powerful of pricing negotiation. They began to get into convenience store industry 4-5 years ago. Their lower product pricing and store expansion strategy highly affect on sale in specific area (average 20

to 30 percent revenue decrease according to ABC Company executive summary 2008). This is one of major pressure to change management strategy. Product differentiation is the strategy that was used by introducing ready-to-eat product to consumer several years ago. Food product category also significantly has higher margin than non-food product. Average gross margin of food product is from 27 to 29% while non-food product is about 24% to 26%. This is an opportunity from differentiation to focus on foods product group.

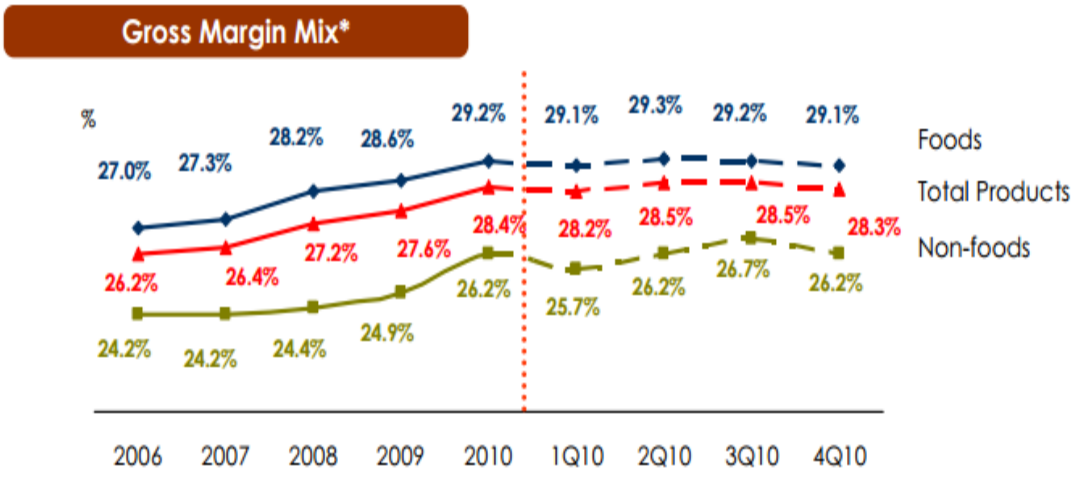


Figure 3.1: Gross Margin trend of Food/Non-Food product of ABC Company

(Source: Operational Highlight of ABC Company)

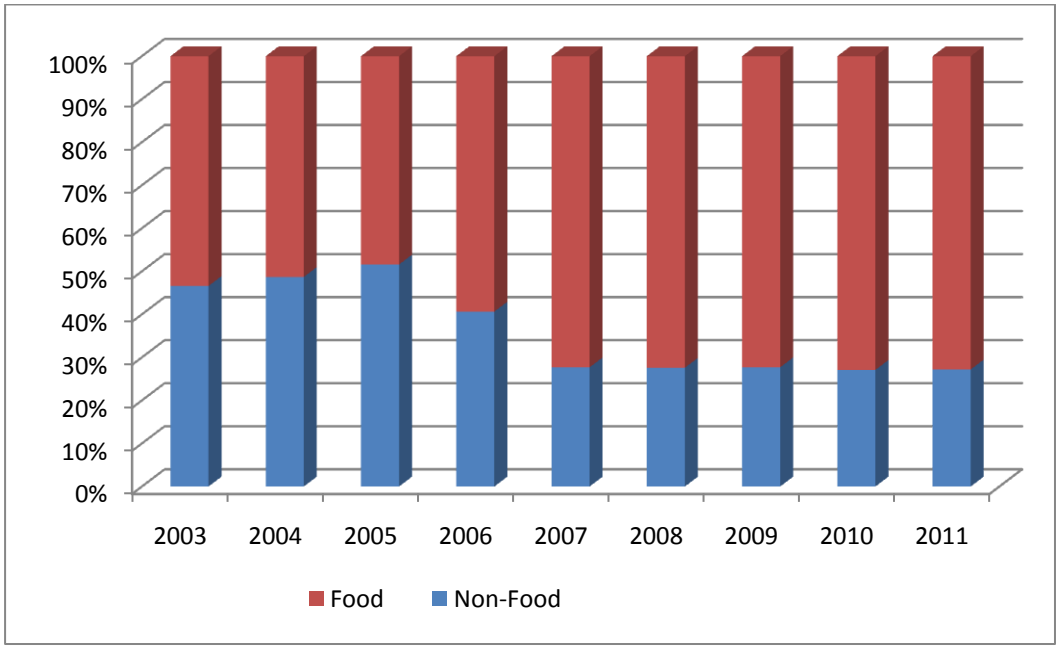
3.1.2 Customer Behavior

The customer behavior is the critical factor that drives organization to change their business processes and concepts. To respond the customer's satisfactions which constantly change, organization need to change the strategy on merchandising, product, pricing and services constantly too. To maintain market leader in convenience store chain business, it should improve the business process in order to

have flexibility in operation. If the firm managing with the old fashion style, it could not quickly respond to customer's need.

3.1.3 Change of Business Direction & Product's Characteristics

Business direction tends to increase foods product fraction especially ready-to-eat product. Food product sales mix dramatically increases in 2006 and 2007 afterward food sales fraction gradually has changed since 2008 as can be seen in below figure:



Product sales mix %	2003	2004	2005	2006	2007	2008	2009	2010	2011
Non-Food	46.6	48.7	51.6	40.65	27.7	27.6	27.7	27.1	27.2
Food	53.4	51.3	48.4	59.35	72.3	72.4	72.3	72.9	72.8

Figure 3.2: Trend of product fraction between Non-Food and Food product of ABC Company (Source: Operational Highlight of ABC Company)

Store expansion strategy is also another factor that drives organization to change. In the beginning, no. of store is less and every store was located in Bangkok so the delivery method is to deliver products directly to store by supplies. Certainly,

direct delivery approach contributed to lot of problems, for instance, cost inefficient, reliability of supplier, high stock level and store staffs have to do receiving process frequently in each day. These problems drive to change the supply chain management for many years ago. The solution of these problems is to obsolete direct delivery by suppliers to establishment the decentralize center to deliver product. This is one of the changes that benefits organization in terms of management and cost of operation.

Afterwards, the context of supply chain keeps changing continuously. New product especially short shelf life products were introduced to sale which required more frequent of delivery and specific management. Delivery cycle and ordering method need to be changed to be appropriate with product's characteristics. Inappropriate management could create both waste and opportunity loss from inaccurate order forecasting. All of these are massive drivers that lead to change the supply strategy.

3.2 Problem Analysis

To analyze causes of waste of fresh product, the source of data to be analyzed is sale and write-off worth of fresh product group. Due to the business confidential, the available sources of data are 2 months sale and write off worth of fresh product group (3-6 days shelf life). ABC analysis is the analysis tool to be used for this case. ABC analysis is the method to classify item into groups based in sale rank. There are 3 ranks which are A, B, and C. For this case, A is the 20% of SKUs of top rank sale. Rank B is 30% of SKUs and Rank C is the rest SKUs which is 50% of SKUs. This would help to classify product analyzed into 3 groups. The below figure are the 2 months data of sales of fresh product category.

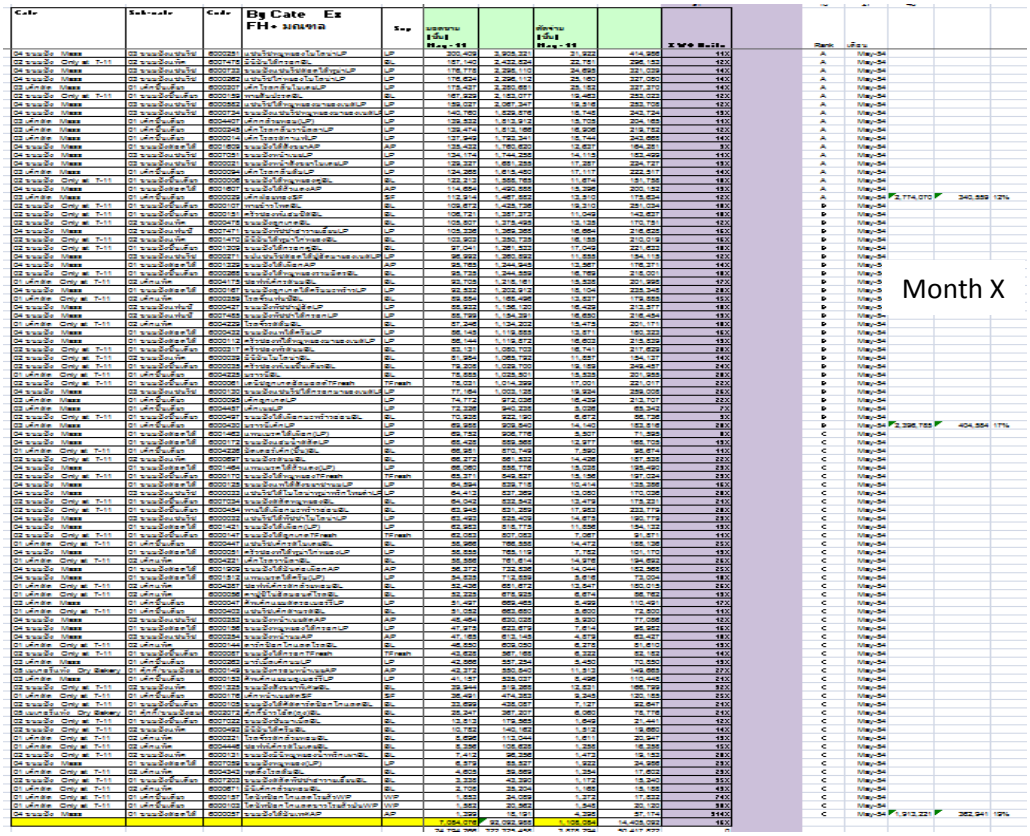


Figure 3.3: Two Months Sale/Write-off Data of Fresh Product Group.

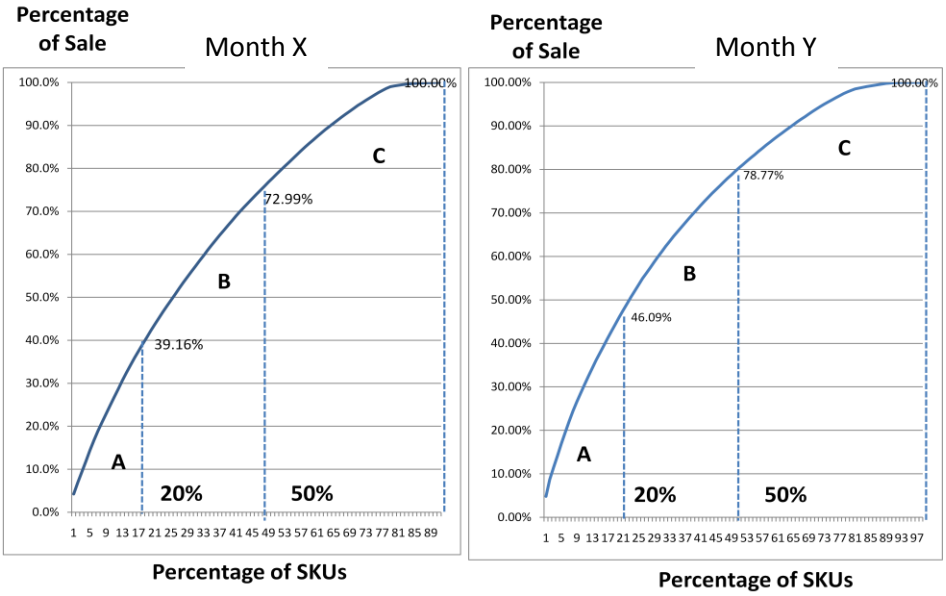


Figure 3.4: ABC Analysis of 2 Months of Sale Data

The above are the figures of 2 set of sale data. There were divided in 3 segments.

- First segment is segment A. Rank A is 20% of SKUs that create approximately 39% and 46% income for this product groups in different month.
- Second segment is Rank B segment. Rank B is 30% of SKUs which give approximately 34% and 33% worth of sales.
- Last segment is Rank C. 50% of SKUs was ranked in C segment. From above figure shown approximately 27% and 21% worth of sales.

From ABC analysis shown that rank A generates the greatest income. Rank B and rank C create sale about 33% and 24% accordingly. However, this shown that individual segment does not create obviously different in sale. So every product segment need to be focused and be analyzed equally to define cause of waste.

Next analysis is focusing on write-off rate of product in category. Write-off rate would be important indicator to measure the situation of product waste. According to practical business management, zero waste is not realistic goal for fresh product management. The practical target, which is the total agreement target form committee, is 10% write-off rate from sale. 10% of write-off rate was committed as the optimal target rate which is not creates too much waste and not lead to opportunities loss from non-attractive product displaying. Below figures illustrate the write-off rate of each product in category.

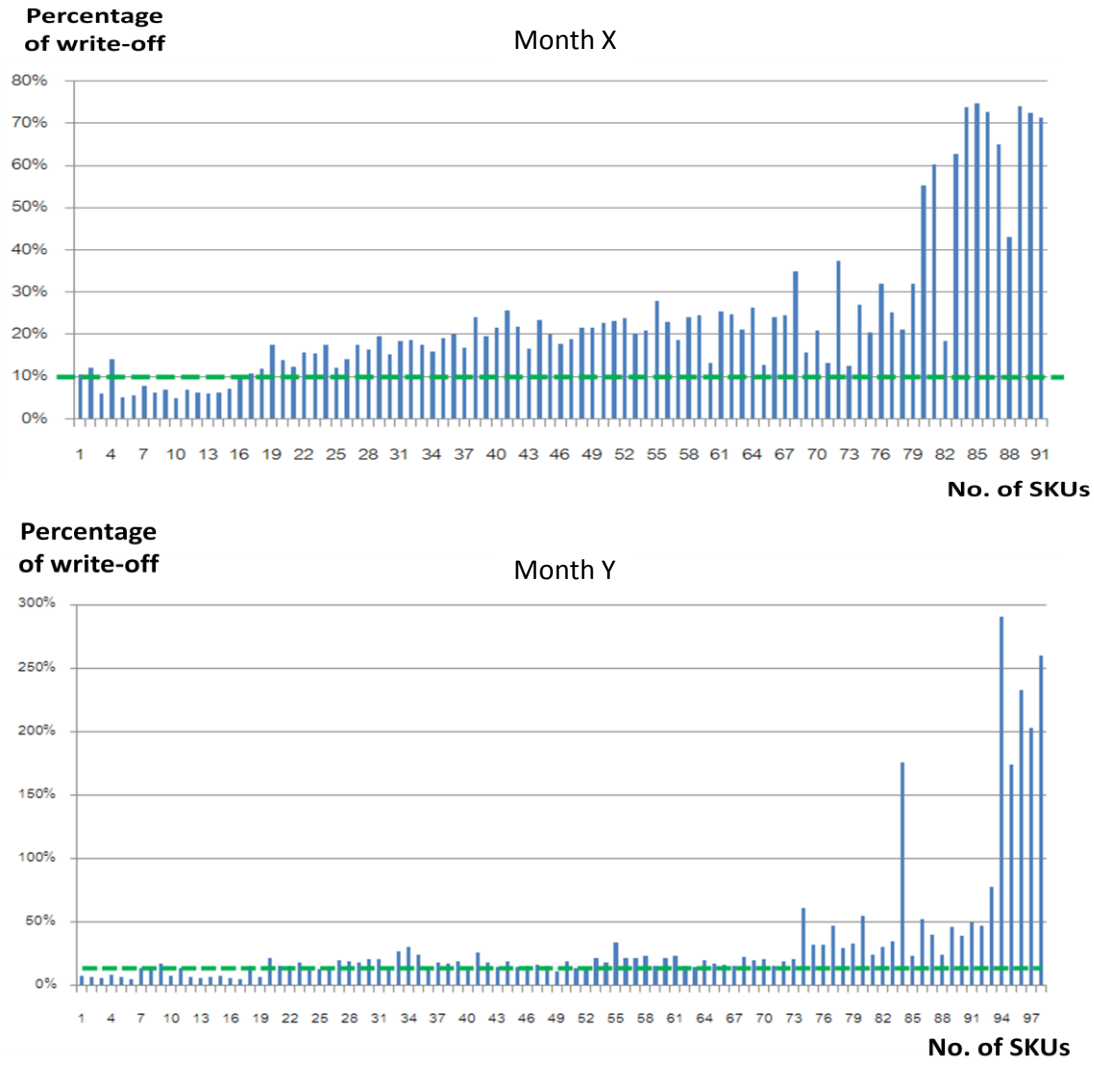


Figure 3.5: Two Months Average Write-off Rate of Fresh Product Group.

The analysis shows trend of product write-off rate. On x-axis, the top sale products were sorted form left to right. Y-axis is rate of product write-off. Above figures show the increasing of write-off rate from top sale product to bottom rank product. There show most of products have write-off rate greater than firm's target (10%) significantly.

	Month X	**Month Y**
Sale(Baht)	322,325,458	330,788,341
write-off(Baht)	50,654,422	50,789,921
Average write-off rate	15.72%	15.35%

Table3.1: Sale Worth, Write-off Worth and Average Write-off Rate of 2 Months.

The total average write-off rate shows that there is a lot of waste form short shelf life product. When product reach printed expire date on package it need to be thrown away and be recorded as store's operation cost. There are approximately 15% to 16% of product sale. These rates still over the targeted rate at 10% which can be concluded that currently overall of this product group generate waste about 5-6% of sale.

To be more specific analysis, according to the classified 3 segments of product, next step analysis is to analyze 3 different segments individually in order to clarify product sale/write off pattern of each product segment.

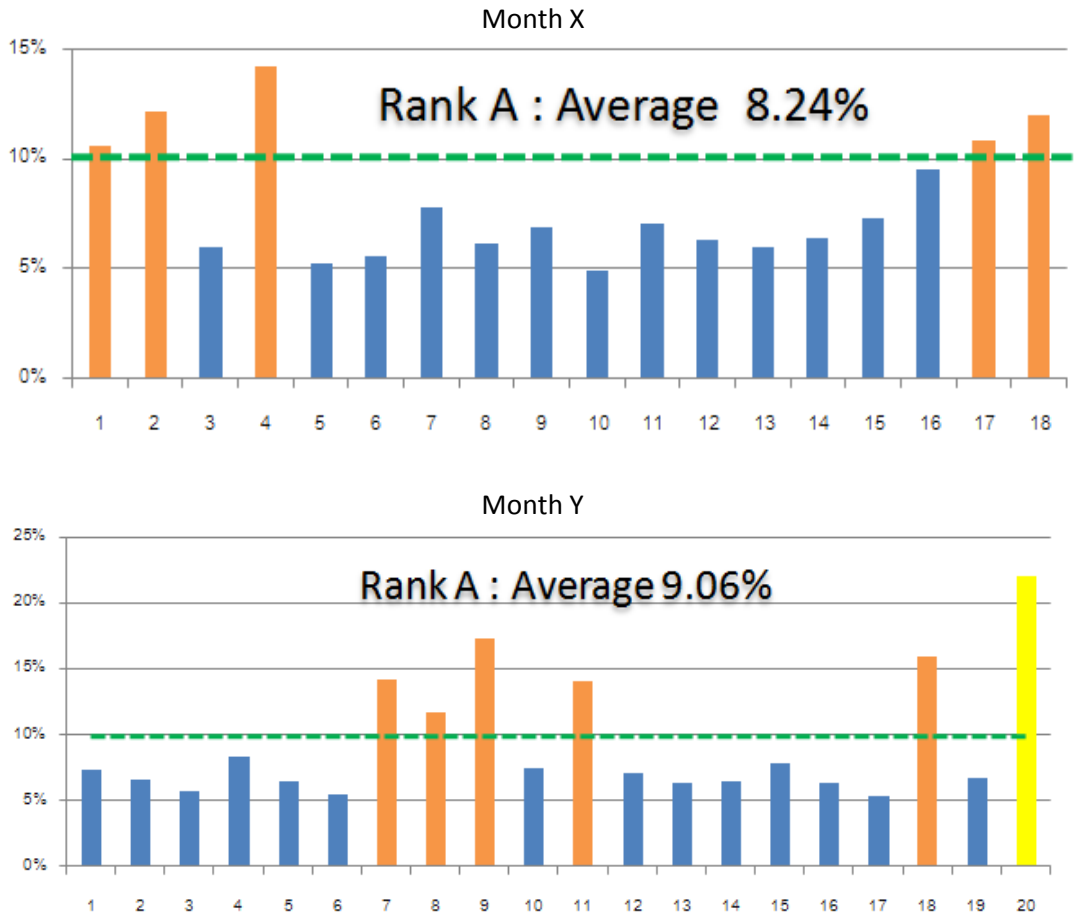


Figure3.6: Average Write-off Rate of Rank A Product

From the above figure illustrate the write-off rate of rank A segment. There show that mostly of products have lower rate than 10%. There only 5-6 SKUs that have write off rate greater than 10%. These could be pointed that the problem of this segment is not waste from throw away but it is an opportunities lost of sale. The major cause of opportunities loss of sale is from underestimating of ordering.

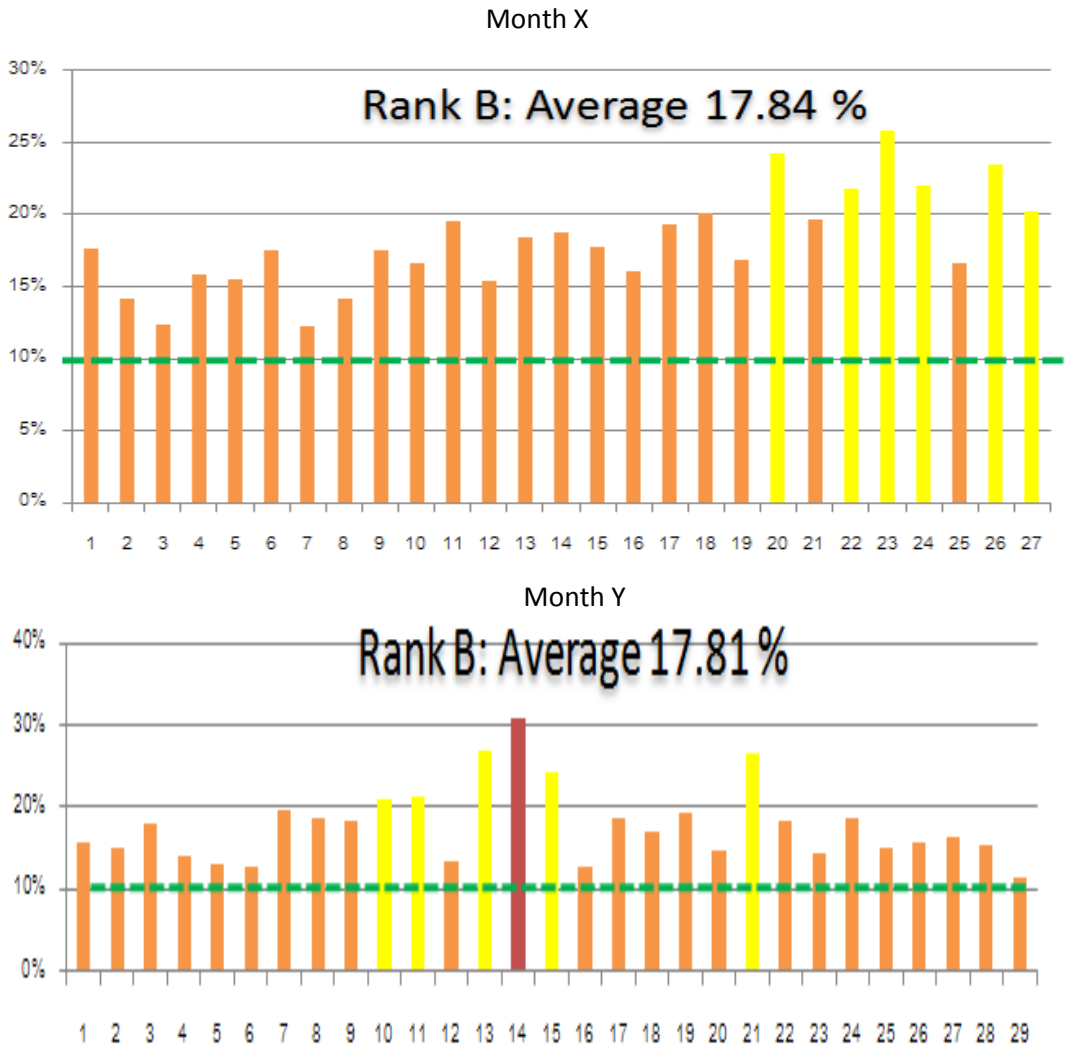


Figure3.7: Average Write-off rate Rank B Product

Second segment is rank B. Graphs show that most of write-off rates of this group are in 10-20% range. There are several SKUs which have write off rate greater than 20%. The major problem of this segment is product waste from overestimate ordering.

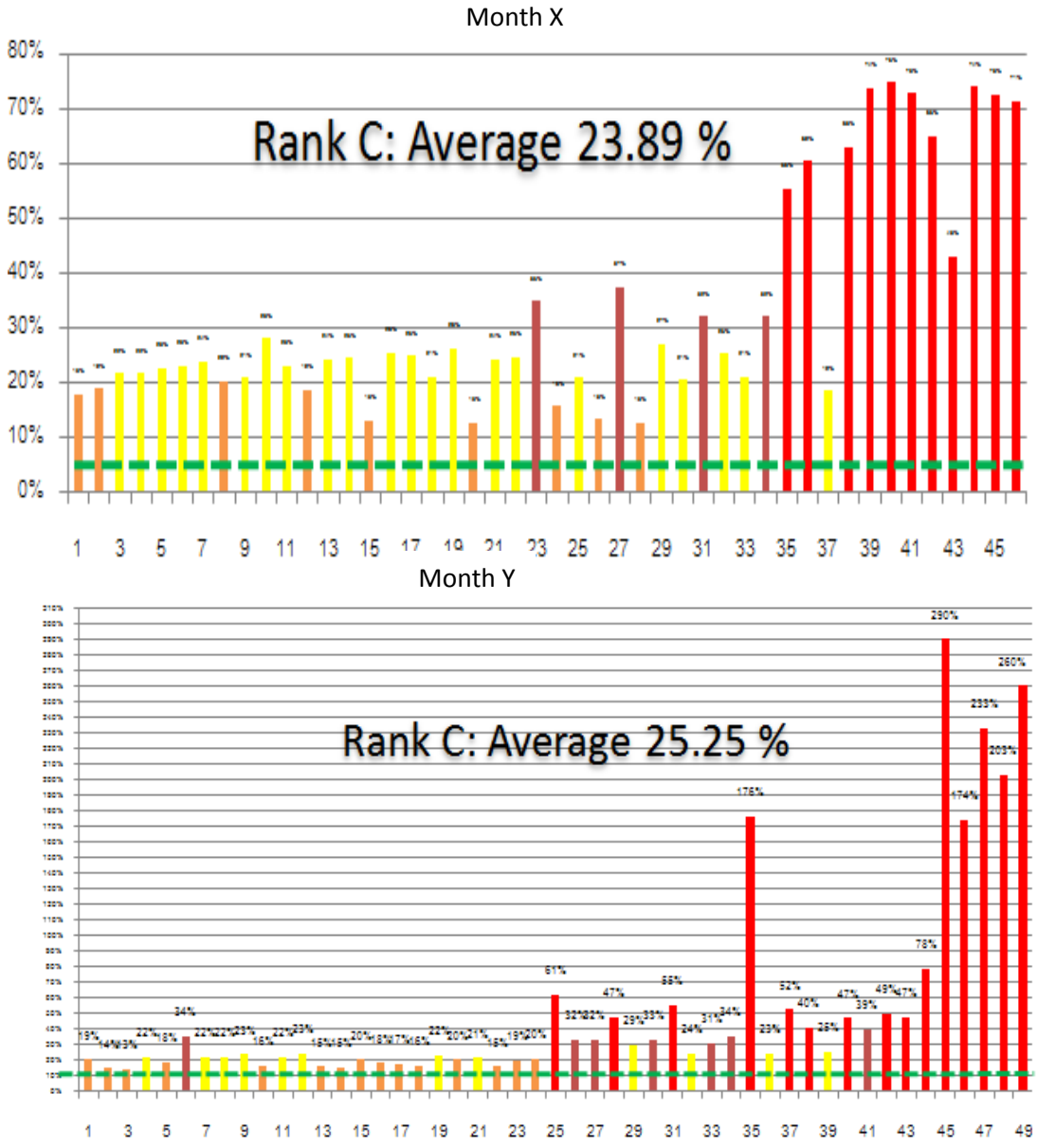


Figure3.8: Average write-off rate of Rank C Product

Above figures show the massive write-off rate of product in this rank. Most of them have write off rate greater than 20%. Moreover, nearly half of it has write-off rate greater than 30% which are extremely high write-off rate. More than half no. of SKUs in this rank have overestimate ordering problem. It also found that about a quarter of SKUs have significantly high rate of write-off.

	Rank A (18 Items)			Rank B (27 Items)			Rank C (46 Items)			
Month X	0- 10%	10%-20%	20%-30%	0- 10%	10%-20%	20%-30%	0-10%	10%-20%	20%-30%	>30%
Items	13	5	0	0	20	6	0	9	22	15
Avg write off rate	8.24			17.84%			23.89%			
Sale worth	126,220,200			109,053,702			87,051,555			
Expected write off worth (10% of sale)	12,622,020			10,905,370			8,705,156			
Write off worth	10,399,434			19,455,056			20,799,930			
Diff	2,222,586			-8,549,686			-12,094,775			

	Rank A (20 Items)			Rank B (29 Items)			Rank C (49 Items)			
Month Y	0- 10%	10%-20%	20%-30%	0- 10%	10%-20%	20%-30%	0-10%	10%-20%	20%-30%	>30%
Items	14	5	1	0	23	6	0	15	12	22
Avg write off rate	9.06%			17.81%			25.25%			
Sale worth	152,450,012			108,115,176			70,223,153			
Expected write off worth (10% of sale)	15,245,001			10,811,518			7,022,315			
Write off worth	13,810,693			19,251,232			17,727,996			
Diff	1,434,308			-8,439,714			-10,705,681			

Table3.2: Summary of sale/write off worth

Above tables summarize worth/detail of write off rate and distribution of rate in each segment. There also show calculated worth that versus with committed rate (10%). There show that segment A have opportunity loss of sale at about 1.5 to 2.0 million Baht per month. Segment B create about 8.5 million Baht of waste from overestimate ordering.

For the last segment, there could not be summarized that all waste were caused by overestimate due to there are lot of products that have significantly high rate of write off which are cause by force sale item policy. Currently there is not empowering

process at store level to delist slow moving products. These also another factor that create waste at store level. To roughly calculate which product are the dead sale product and need to be delisted from store, it could be implied that products that create waste percentage greater than average gross profit percent (approximate 29%) are the waste from lack of product delisting store process. There are 15 SKUs in segment C that have average write-off rate greater than average gross profit percent which worth 4,330,189 Baht. Another month, there are 22 SKUs in segment C which worth 6,589,284 Baht.

		Month X	Month Y
Ordering	Opportunity loss of sale (Baht)	2,222,586	1,434,308
	Overestimate ordering waste (Baht)	16,314,272	12,556,111
Lack of product assortment process waste (Baht)		4,330,189	6,589,284
Total waste (Baht)		**22,867,047**	**20,579,703**

Table3.3: Summary worth of opportunity loss and waste from 2 months data.

From summary table show that major cause of waste is fluctuate ordering. Both underestimate and overestimate create waste from opportunities loss of sale waste from throw-away expired products. Only ordering problem causes about 75 percent of total waste. For the rest of problem, waste from dramatic write off worth (over than 29%) could be implied that all of these products have very low potential and need to be cancelled from store. The major cause could be there is no systematic process at store level to do product delisting from store. Similarity, this would caused by force sale strategy from Headquarter side.

3.3 Current Process Analysis

Ordering process is one of the most important parts in convenience store industry. The main purpose of product ordering is to maintain product's availability in store. Each store has to order product daily by their own judgment by using supporting information from HQ/each store historical sales data and others. However, the current fresh product ordering processes are confusion and mostly are manual processes as described in problem description. The current process was adapted from long-life product ordering process which is the difficulty in practical operation. Store staffs have to write down sale record, write off, inventory and order manually in work sheet. There are no graphical to aiding analysis because all information support is shown in number pattern. Store staffs have to write down the order then entry the written order quantity into EOB (Electronic Order Terminal). This is not rational working process for modern business management. Moreover, this ordering method has to be processed daily with nearly 100 SKUs of fresh products.

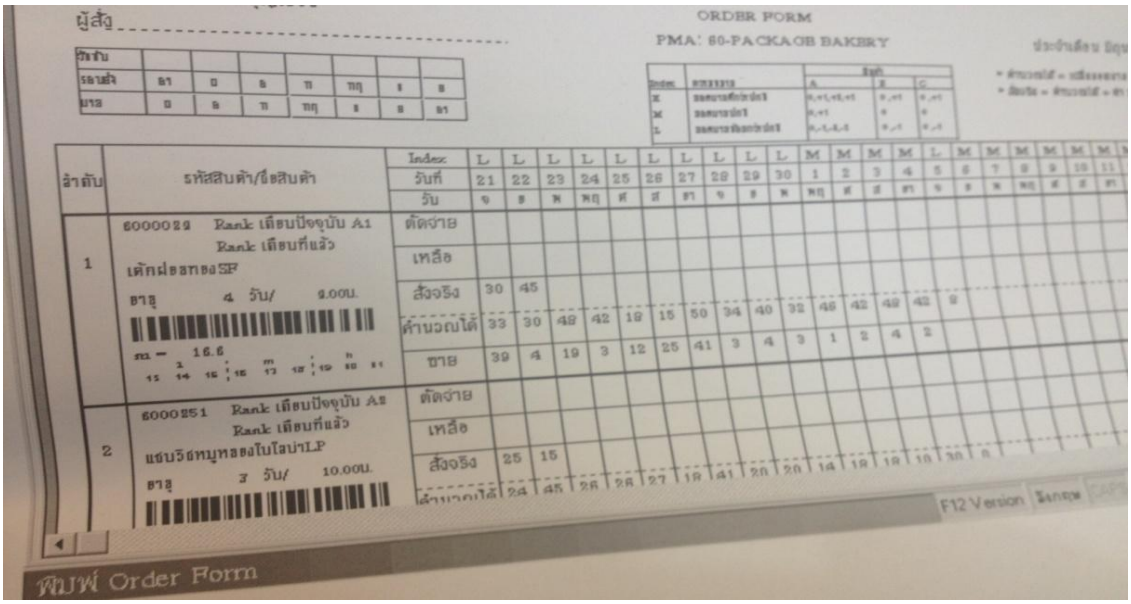


Figure 3.9: Current Ordering Worksheet of Fresh Product

CHAPTER IV

PROCESS DESIGN FOR FRESH PRODUCT MANAGEMENT

According to above problem analysis results, there are two main causes of problem which are inappropriate ordering process and force sale item strategy. However, to resolve these problems, it required overall process reengineering in order to compatible with practical operation. The main focusing is on redesign ordering process and assortment process. Others refined segments (Policy, Distribution, Logistics and etc.) are the suggestion to fulfill the completeness of problem resolving.

4.1 Proposed Policies/strategies on Fresh Product Management

To reengineer process from traditional systems, it surely requires some modification on policy (Robert E. Stein, Marcel Dekker) Merchandising policy on fresh product also need some modification for this research. There are many current policies which not conform to nature of product and could be one of the major causes of fresh product's waste. Some constrains of merchandising policy influence negatively on business processes especially at store level. To improve business process, managing policy of fresh product should be revised to be prospered the nature of product and satisfy customer's need.

4.1.1 Policy on Forced Sale Item

"Forced Sale Item" means the item that was defined as an important product. The regulation of "forced sale item" is as a core item product which must always available at store. Currently, the stores that were selected to sale chilled lunch box have to always available all SKUs in category. The purpose of this policy is to promote all products in category. This is the strategy for new product introduction in

order to build up customer perceive in the beginning product lunching phase. However this is not sustainable strategy for long run business. According to 7-Eleven, INC. documents 2005, their merchandising strategy on fresh food products is fully empowers staff to manage product assortment. They employed item-by-item management to monitor top-selling product. Consequently, it drive store staff to closely monitor customer buying pattern in order to maximize sale by staying stocked on popular items. On the other hand, slow moving product also be monitored and finally be disposed from store. Its empower store to decision to managing product assortment.

The suggested approaches are to use this strategy with limited period or totally cancel this strategy. First suggested approach is to force core item strategy for new product introduction period. This mean every new product still must be available at store but it have limited period of "must be availability". The period of availability is upon individual product life cycle and characteristics. Propose of this period to give time for product introduction (promotion, customer's perceive). Store staffs are not allowed to delist this product until it reaches the determined date. Then product reaches its allowed time, store staffs can delist the product if it has slow moving sale. This approach may suitable for current business context which have less variety of products and lack of readiness of store staff to analyze product assortment. Fully managing product assortment may negatively effect on sale if based on current situation.

Second suggested approach is fully empowering store staff to decide which product should be or not be in their store. Basically store is the closest function which knows what customers actually want and what behavior customers are. They have their own information based and local customer's preference which benefit for

decision making. Store may know that some product is not suit with their store according to individual sale history and sale experience. The approach is to allow store to decision to sale the product or not sale the products that not match with their local customer's preference.

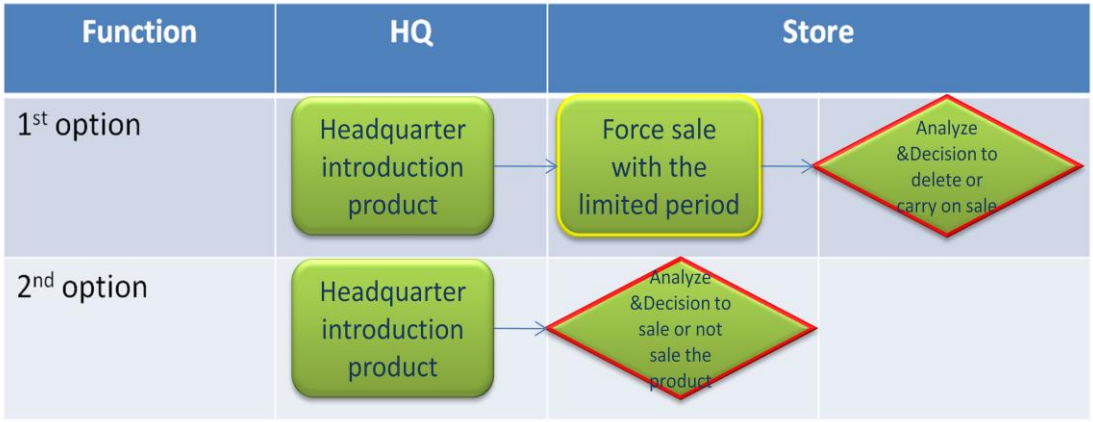
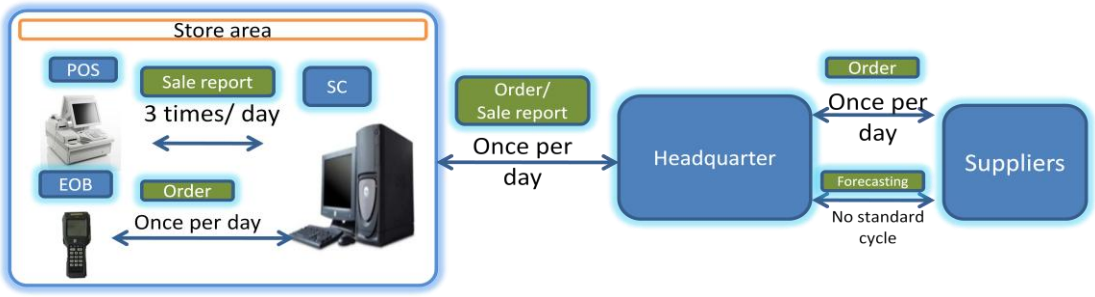


Figure 4.1: Proposed Approach Options of New Product Introduction

4.1.2 Policy on Information Management

According to The Cambridge International college's Publication, the definition of Supply chain management is *"The supply chain encompasses all activities associated with the flow and transformation of goods from the raw materials stage (extraction), through to the end user, as well as the associated information flows. Materials and information flow both up and down the supply chain."* It is not only physical good to be apart in supply chain management. Information flow also critical part for nowadays supply chain management. Limited information sharing between firm and supplier would be one of major problem that cause of waste in supply chain. Currently sale report is confidential information and is not allowed to assess by any suppliers. Suppliers receive order quantity only once a day even fresh products have high risk of waste.



Current Information Transferring Model of ABC Company

According to the successful relationship case between P&G and Wal-mart, information partnership is the key successful factor of their relationship. They jointly develop the data highway to link both data center together to share each other information. They use this highway as a foundation for every management process.

To be long term and as strategic partnership, information sharing would be the key component. Information would help to enhance both the firm and supplier processes to be more efficient. Food processing, distribution and all other related functions would benefit by enhancing degree of information sharing. This also could reduce lead time in ordering system by eliminate waiting time and could enhance accuracy of order forecasting.

4.1.3 Long Term Business Strategy on Fresh Product Group

Currently chilled lunch box products are available only in Bangkok and suburban area due to constraints of supplier capacity, distribution and product shelf life. The supplier's factories also are located on greater area of Bangkok. However, corporate direction tends to coverage these product categories into all regions. This strategy require long term plan between all parties.

“Supply chain management is the systematic, strategic coordination of the traditional business functions and the tactics across these business functions within a particular company and across businesses within the supply chain, for the purposes of improving the long-term performance of the individual companies and the supply chain as a whole” (Mentzer et al., 2001) To be Long term partnership, business strategy should be formed accordingly with business strategic and collaboration from all stakeholders. It also need to concern on characteristics of product especially fresh product. The managing of fresh product is different from grocery or long shelf life product managing. It has high frequency of delivery and lower volume than grocery product. Product Shelf life is the critical concerning. The frequency of delivery also has to be clarified. “Are fresh products that have 1 day shelf life and deliver 3 times to store per day become the new strategic product instead 3 to 6 days shelf life and once a day delivery?” These questions have to be answered in order to have clear direction on facilities planning, system planning and framework with supplier.

4.1.4 Distribution Strategy

Distribution Center (DC) expansion is the key facility of supply chain system. The location of distribution will highly effect on cost of distribution in long run business. It also effect on lead time to store which is the important factor for short shelf life product.

Area Dominance strategy of 7-Eleven Japan mainly focuses on cost of delivery and distance of delivery. According to 7-eleven Japan Cooperate outlines 2011, area dominance strategy is a format of store opening strategy. Size and capacity of 7-eleven’s DCs Japan are coverage store around 50-300 stores (Akira Ishikawa, Tai Nejo, 1998). The managed distribution of 7-Eleven USA is also familiar to 7-elecen

Japan. They work with its vendors and distributors to provide daily delivery of fresh products. Vendors include independently-owned and operated bakeries and commissaries that provide daily deliveries of fresh foods, such as sandwiches, salads, and baked goods, to its stores. In addition, the company uses 24 distribution centers in the United States and Canada to service approximately 4,900 of its stores. Each center serves about 200 stores, on average. These centers typically serve stores within a 90-minute drive. The distribution centers, which consolidate ordered from multiple suppliers for daily distribution to individual stores (7-Eleven, Inc document). 7-Elven Japan consider its market dominating strategy of high-density, clustered store openings to be the key to efficiency and stability as can be seen in below figure.

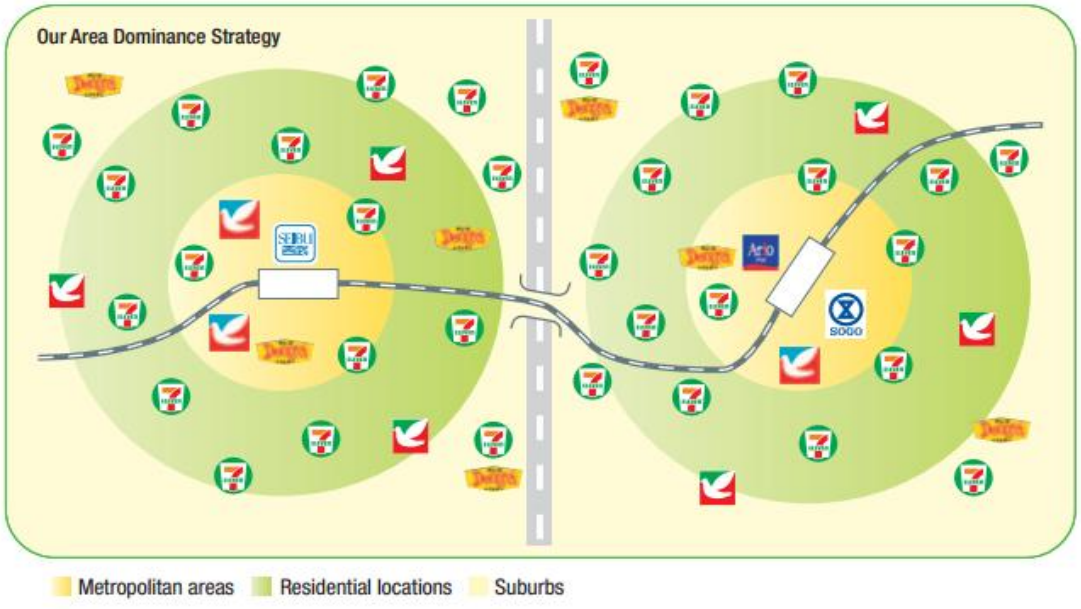


Figure 4.2: Area Dominance Strategy of 7-Eleven Japan

(Source: http://www.7andi.com/en/ir/pdf/corporate/p08_19.pdf)

In contrast, the strategy of ABC Company does not concern much on cost of delivery and distance. The size and capacity of DC also totally different, most of DC of 7-eleven Japan are coverage store around 50-300 stores while DC of ABC company coverage store around 1000-2000 stores. The store opening concept is

totally different too. For SEJ , DC will be established together with store in that area which mean that some areas in Japan do not have 7-Eleven store while ABC company will be open new store based on customer demand survey in every area of Thailand.

The current strategy of Distribution Center expansion of ABC Company is to expand into every region. The Region DC expansion concept was adapted from “Area Dominance System” of 7 Eleven Japan. Objectives of regional distribution center establishment are to reduce delivery cost and lead time. Even current plan of CDCs is expanding into every region, fresh product supporting still be suspicious. The DCs, CDCs expansion models mainly support grocery product and fresh product that have 14 days to 1 month shelf life. From the investigation, short shelf life fresh product supporting facilities are not fully included in this plan. There are no clearly framework on CDCs expansion and supplier’s facilities (Food Factory). The recommended approach is to jointly develop and do investment feasibility by researching customer’s behavior in each region. The CDCs expansion strategy needs to collaborate with supplier’s facilities expansion. The supplier food factory should be located near distribution center in order to reduce lead time which is the critical factor in fresh product industry in case there is market possibility.

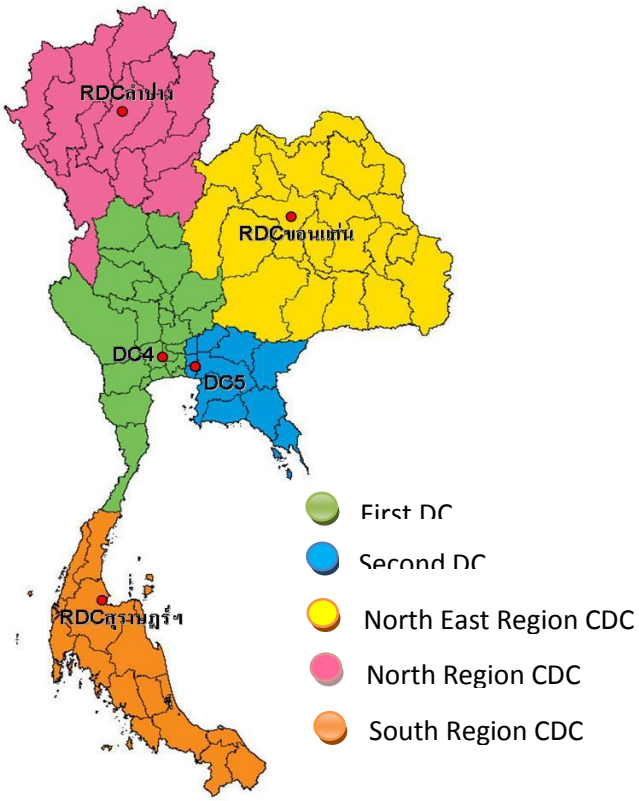


Figure 4.3: Planned DCs, CDCs Expansion

(Source: Logistic plan presentation of ABC Company)

Clarified policy would help cooperate to have business direction and long term business plan. These also the initial factors for business process designing. However, form the current context, CDCs expansion would not be changed easily due to the invested facilities and current store opening strategy. Area dominance strategy could not be used fully in Thailand due to different of distribution of the population. Regional CDC expansion is the strategy as the above figure.

4.2 Business Process Supporting Fresh Products Management

As explained in problem description analysis, long lead time is the critical factor that effect negatively on fresh product supply chain. Due to short shelf life of product, non-inventory and constrain of distribution location, responsiveness, agile and lean supply chains are principles to be concerned. “Both agility and leanness demand high levels of product quality. There also require minimum total lead-time defined as the time taken from a customer raising a request for a product or service

until it is delivered. Total lead-time has to be minimized to enable agility volatile and thus difficult to forecast. Shortening lead time would enable capable to respond customer's demand. Furthermore effective cycle time reduction leads to significant bottom line improvements in cost saving and productivity (Towill, 1996).

Lead-time need to be shortened by defining what wastes in chain are and eliminate it all. Both lean and agile will be used as a principles for process designing. In term of lean, excess time/activities and information will be eliminated from processes while agile will be concerned to design for responsiveness of sensitive customer's demand. The process design will be also designed based on "Retailer Initiative" philosophy. Retailer Initiative is 7-Eleven's strategy (USA, Japan) for providing customers with what they want through strategic item-by-item management at each store (7-Eleven, Inc). This concept will be used as a fundamental for all business process designing in this case. The main purpose is to respond customer's needs which continuously change.

Product Assortment Processes

4.2.1 Production Introduction by Headquarter Process

The current processes of new arrival of fresh product can be called "acknowledge new product to store" which mean headquarter inform new product to store for sale. Stores just are acknowledged about arrival date of new product with some product information then just sale it. This may inappropriate process because some products may not have potential for all stores. It could be a cause of waste form not matching product with customer's preference. Furthermore, the future plan on fresh product category is set as a strategic product that planed to be sale nationwide. Preferences of customer are different according to culture, religion ethic and etc.

Current product introduction process could not be the sustainable strategy for long term business plan.

The suggested processes called “Product Introduction”. Product introduction means headquarter introduce product to store instead inform product to store. Especially food products, there have different customer’s preferences in each area. Furthermore, even same area, the customer’s preference also different store by store. The approach is to introduce product based on preference area.

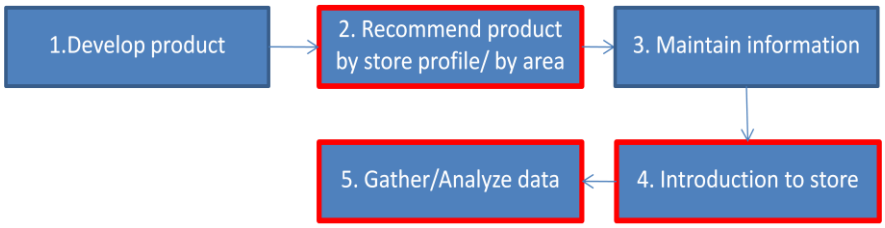


Figure 4.4: Product Introduction Process by HQ

1.) Develop Product

This process is not highly effect on supply chain of product. Processes are mainly related on food ingredient, preference testing, quality assurance and etc. The recommended approach could be more information usage from sales history, trend of customer’s demand and to be more localization in order to be ready for future coverage area and increase varieties of food. It also needs collaboration from supplier for develop and continuously lunch new product to satisfy change of consumer demand.

2.) Recommend Product by Preference Area.

After product development process, the product has to be recommended to store. According to the business direction that “tends to increase the variety of product and coverage into every region”, Fresh product could be increasingly SKUs. It is

impossible to force every fresh product to be available in every store. Recommendation product by preference is the way to roughly cluster products based on preference of customer. The recommend area is based on customer target such as business area, school, and gasoline station. It also based on preference of customer based on geography such as people in south don't consume pork much and people in north-east mainly consume spicy taste. The distribution channel and method also have to be determined according to product handling standard (temperature control) and distribution coverage. The area recommendation would help to primarily filters product for stores to have suitable products. Some products may not be recommenced to south region due to ethic constrains. Some product may be recommended to north region due to not matching customer's preference. Some product may be recommended to all areas due to it is the basic preference for everyone.

3.) Maintain Information

Every product has to be registered into master information maintenance. This is the foundation for every product management process and function. Any related information about product must be recorded in item master.

Information	Descriptions
On shelf date	First date on sale
Order start date	First date for ordering
Product classification	Core/option
Product condition	Allowance period for store to be able to delete
Product category	Category of product
Product name, code	-
Vendor name, code	-
Product shelf life	-
Delivery cycle	Daily or others
Delivery method	Temperature control, ambient
Retail /cost price	
Product support information	Promotion/out of product from supp
Recommended area	North, south, east, north east, middle and Bangkok
Recommended store profile	School, gasoline station, market, office area etc.

Table4.1: Information used for Product Maintaining Information.

4.) Introduction to Store

After determine the recommended area, merchandise have to introduce new product to store. The process is not just informing product for sale but have to include analytical information for store's decision. The analytical information is to support store's decision to sale or not sale this product. HQ have to recommend the reason why store have to sale, which store profile match with this product and what is to promotion/campaign of this product.

Information	Descriptions
Product picture	Picture of product
Product name, code	-
Product descriptions	Product details / description/ handling
Retail price	-
Gross profit	In percentage and GP per unit
Target customer	Offices / housewife /students etc.
Eating situation	Breakfast/ lunch/dinner etc
Product display	Recommend display area
Delivery cycle/method	Daily
Ordering	Daily
Advertising campaign	-
Promotion	-

Table 4.2: Product Introduction Information for store

5.) Gather/Analyze Data

After recommend product to store, merchandisers have to monitor the registration status and first order quantity. All store have to decision to sale or not sale (will be described the detailed process later in Product selection by store process). The first order quantity will be gathered and send to supplier for further processing. After that, merchandisers have to verify sale of new product in the beginning introduction phase. The monitoring phase period is upon the characteristic and life cycle of product. Normally, new product is needed time to introduce for customer. The introduction period is the judgment period of new product. Merchandisers have to

closely monitor, analyze the sale report in order to adjust the managing strategy of product. Due to the new regulation is empowering store staff to delete product after allowance period, merchandising process have to be aligned this regulation.

4.2.2 Product Selection by Store

Analyze current and historical sale and profit success, sale trend comparing and variety of product. These are the activities to find which product is the winner and losers in assortment. The is the suggested additional process in order to support store to have “right product” at store. “Right product” means the product that suitable for individual store. Product assortment processes is the approach to select appropriate product, accordingly it would help to reduce waste form inappropriate products.

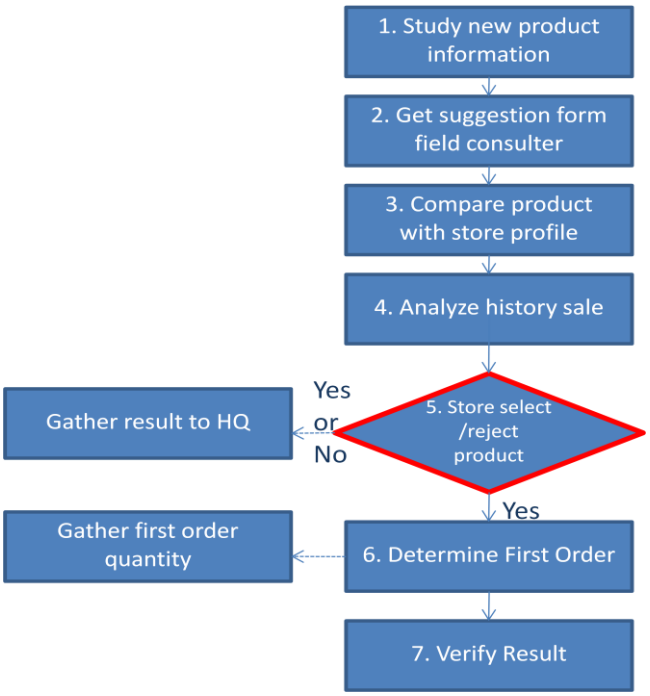


Figure 4.5: Product Assortment by Store Process

1.) Study new product information

Store staffs have to study new product information that send by HQ. The information is formed as analytical to support store decision. Store staffs could

estimate the new product potential from their own experience and could have informal decision to sale or not sale this product in their store. However, they still need other supporting information to ensure the decision.

2.) Get Suggestion from Filed Consulter

Filed Counselor (FC) is the existing function that authorized to manage their responsible stores. The working scope of FC is to suggest and communicate any massages form HQ to store. New product introduction process in one of important processes that FCs need to closely monitor and communicate to store. Information that send to store by HQ could not sufficient for decision and there may have some detail recommendation the may effect on store staff's decision. FCs have to customize their suggestion store by store due to the product may not suit for some store even they are located in same area. FCs have to communicate the strategies & tactics, trend of product, promotion, product handling method and other related managing. They have to suggest the decision making for store staff to sale or not sale the product. However, the final decision could be on store staff. Store staffs are empowered to decision

3.) Compare Product with Store Profile

Basically, store staffs need to know their store profile and customers group i.e. business area, tourist spot and school. They also have to know the customer's life style behavior and pattern of store visiting. All of these experiences are important factor for store's decision. As store staffs had studied the new product information in the above process, they able to compare the given product information from HQ with their own store profile. They have to decide that the suggested new products are match or not match with their store. This process will be done by store individually.

4.) Analyze History Sale

Another aspect to be concerned is history sale. History sale is also important factor for decision to select or not select new product. Store staff analyzes sales of existing product in same category/sub category. The information sets to be analyzed are having different analysis perspective.

- Sale by category/sub category: to know the potential of same product category
- 12 Weeks report: to know the trend of this product category both by category and by product
- ABC Analysis: to know what are the potential products in this category for store
- Matrix Analysis: to know the variety of product in term of size, price and ingredient.

5.) Select or Reject Product.

After studying, getting recommendation and analysis, store staff is ready for decision to select or not select new product suggestion. This process is designed to operation on computer program. Product information and any sales report will be clustered automatically and show in linkage page with decision screen. The decision process is just clicking the button to select or not select this product. The decision result will be recorded and registered status at individual store and also report to Headquarter.

6.) Determine First Order

If store decided to sale this product to sale, they would determine first order quantity of that product. Basically, first order quantity could base on the sale of

familiar product in same category. Any additional quantity could be used following criteria are:

- Facing/Display space: store staff has to roughly decide number of facing to display product and calculate packaging size with the depth of shelf.
- Order cycle/delivery cycle: store staff has to estimate sale in first order cycle and order the product to be enough for product cycle.
- Promotion/ special event: any promotion and special event that would effect on sale of product should be concerned for first order determination.
- All first order quantity will be gathered and send to headquarter. Then summarize order quantity send to supplier for further production.

7.) Verify Result

After select and determine first order processes, stores have to order and sale product as usual order/delivery cycle. Another major process is to verify sale of new product. Introduction period is an important period to judge the successful of new product. Store staff has to closely monitor and manage new product. There may have some error in the beginning period that could affect negatively on sale of new product. The verification period of new product is determined by headquarter which equal with “allowance period”. “Allowance period” means the period that give chance for new product introduction in order to build up customer perceive in the beginning sale period. Product cannot be deleted by store for any reasons but if product is not in this period or already over this period, store can decide to delete or keep on sale.

4.2.3 Product Delisting by Store

Product delisting process by store is also not current practical process. Stores are not allowed to delete this product category. Store must keep on sale every product until it be canceled by headquarters. Propose of product delisting process is to has procedure to eliminate slow moving sale from store. This would help to reduce waste from inappropriate product. The suggested product deleting by store processes are below:

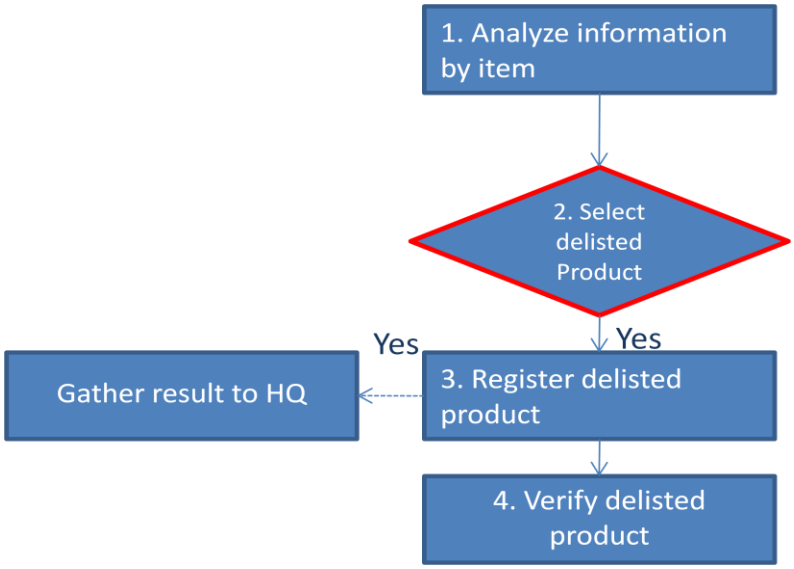


Figure 4.6: Product Delisting Process by Store

1.) Analyze Information by Item

The important process of product delisting is analysis process. Usually, Store staffs have to verify products sale during ordering process. This process also can be done during new production selection in order to prepare space for new product. This process also is important as new product selection process. Due to limited sale area, stores need to have only right product or only potential product at any time.

Firstly, stores have to indentify slow moving product. Slow moving product can be analyzed by ABC analysis. Next analysis tool is 12 weeks analysis. This

analysis will inform sale trend of product. In this analysis also inform the order, write off and out of stock information. There may have some problem that would affect on ABC analysis ranking. Product may be ranked in C due to inappropriate ordering. It probably shows out-of-stock status which can be implied that product have less sale due to underestimate ordering by store. This refer that this product still has potential but the problem is about inappropriate ordering. On the other hand, if 12 weeks analysis shows continuously write off information, this could refer that product actually has low potential.

2.) Select Delisted Product

After analysis process, stores determine the delisted product based on gathered information and analysis.

3.) Register Delisted Product

Stores register the delisted product in to delisted product list.

4.) Verify Delisted Product

Though the delisted product is the products that were decided not to be sale in store, this could not be absolutely implied that this product will forever have low potential. The deleted product still is in store system. It will show the average sale per store per day of other stores in same area. The information filed will hint store staff to decision to re-sale the product again or not. This information will be shown to for store staffs to recognize the potential product in their area. Area sale information also helps to know the potential product in their area in order to focus more in assortment and sale.

4.2.4 Product Discontinued by HQ

The process is similar with the process of product delisting by store but the information analysis is in macro form.

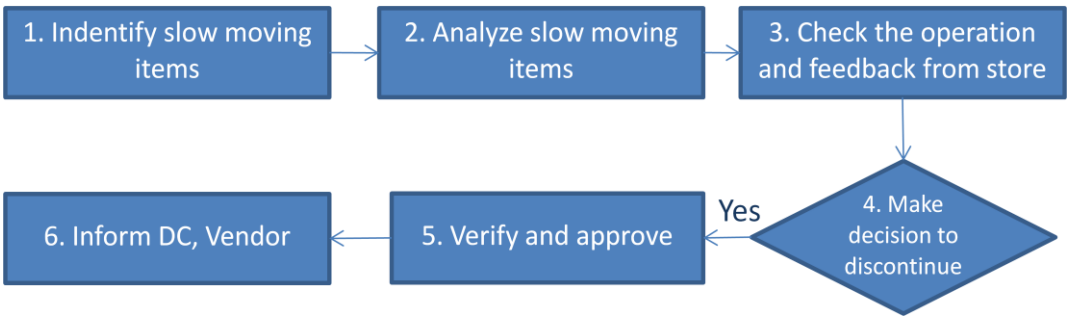


Figure 4.7: Product discontinued by HQ process

1.) Indentify Slow Moving Items

This concept of this process is similar with product delisting by store. The authorized merchandisers have to closely monitor sale of their products. ABC analysis is the analysis tools to verify both potential and slow moving sale. To indentify slow moving item, C rank is the rank to be focused. ABC analysis is ranked automatically by cooperate sale analysis system. This is just the initial indicator to define to be discontinued product.

2.) Analyze Slow Moving Items

After getting filtered product from first step, next is to analyze sale trend, sale rate, order rate and disposal rate of the product. Sale trend will define the trend of this product (incline, decline or stable). There is possibility that sale trend still incline while it is in rank C.

For this case study, merchandiser probably should not discontinue this product due to the inclining trend. For normal case, if product was in rank C and sale trend is decline, it has high possibility to be discontinued. Other analyses such as order rate sale rate and disposal rate also have to be concerned. From this analysis could clarify the hidden problems. This analysis would help to know the root of problem which is not just sales report. These analysis would help to know that the

Order rate	Sale rate	Disposal rate	Possible causes
High	low	High	Over ordering estimate
High	High	Low	Suitable order estimation
Low	Low	High	Declining phase of product life cycle
Low	High	Low	Under ordering estimation

Table 4.3: The scenario cases to supporting decision

Case 1 high order rate low sale rate high disposal rate

Case2 high order rate high sale rate low disposal rate

Case 3 low order rate low sale rate high disposal rate

Case 4 low order rate high sale rate low disposal rate

Recommended solution

Case 1: This mean it have a lot of waste from disposal product which need to be solved urgently by communication or discontinued

Case 2: This is the ideal scenario of general potential product

Case 3: this product should be considered to be discontinued

Case 4: this result shown possibility opportunities loss of sale from underestimate order.

3.) Check the operation and feedback from store

- Display at store level
- Out of stock data
- Feedback from customer

4.) Make Decision to Discontinued Product

After analysis all information, merchandiser could have enough information for decision to discontinue or keep on sale. Merchandiser need to indentify the reason for discontinue, effective date, discontinued area.

Preference area concept also is used for discontinued product. This could help to reduce opportunity loss of sale in case this product still has potential in other area. Area concept will be used as a fundamental analysis for product discontinuing since first step of analysis.

5.) Verify and Approve

Senior merchandisers approve product discontinuing as traditional process in meeting

6.) Inform DC, Vendor

Inform the confirmed production discontinuing to all related parties. Vendor and DC will be informed the product discontinuing accordingly with preference area. Product name, product code, reason for discontinuing and effective date information will be informed to all related parties.

The main purpose of all above processes is to have “Right product” in store. By implementing area product introduction process for headquarter and product assortment process into store working process. “Production Introduction by Headquarter Process” would help to reduce unnecessary product by using area concept for introduction. This is like first product filter before recommend to store. Secondly, “Product Selection by Store Process” is the latter process to select product but this process is responsible by store staffs. Store staffs are empowered to make decision by using efficient information supported. On the other hand, low potential products also need to be moved out from store. “Product Delisting by Store” also is the process which empowers to store to have judgment in order to cancel slow sale products from store. Eventually, if product have low potential till now worth to sale anymore, headquarter have to decision to discontinue this product in specific area or nationwide. Information analysis would help to have accurate decisions. Information

analysis will heavily used in all process than ever be. The summarized figure of product assortment process illustrated below:

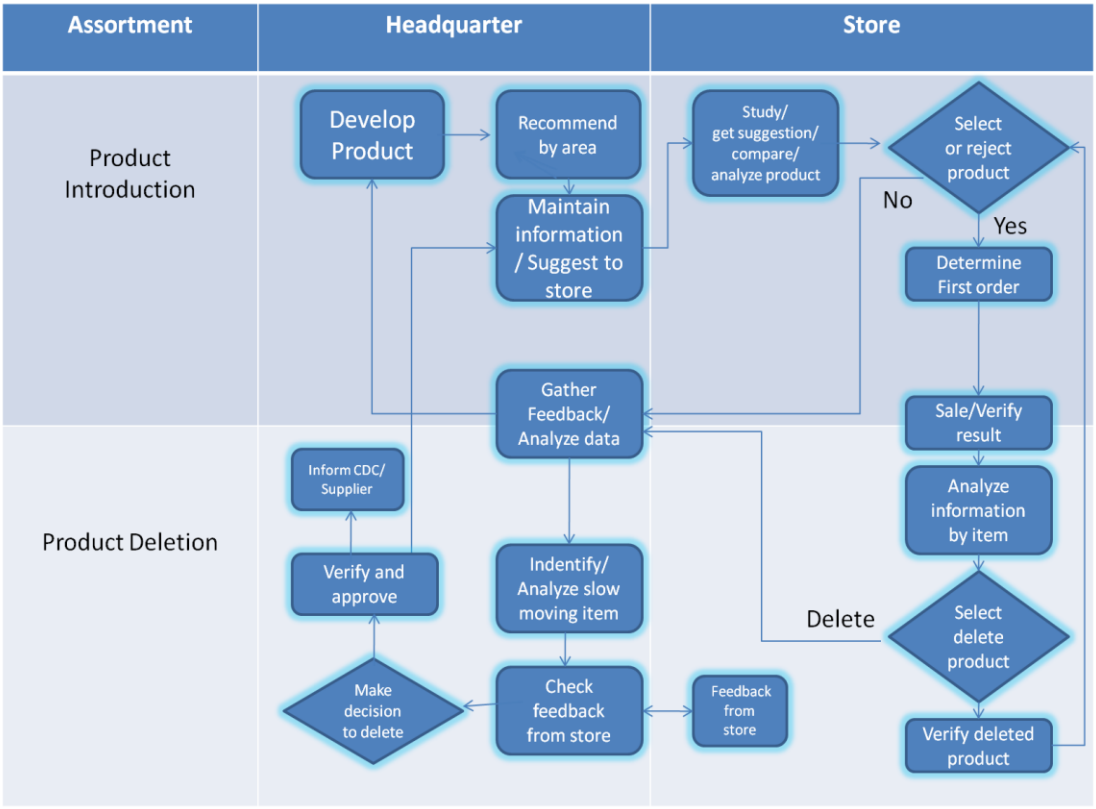


Figure 4.8: Integrated Product Assortment Process of HQ and Store

Store/HQ Ordering Process

4.2.5 Store Ordering Processes

To enhance efficiency of ordering process significantly, ordering process have to be revised and redesign to be consistent with characteristic of product, delivery cycle and current technology. Below are the suggested ordering processes for fresh product based on current context.

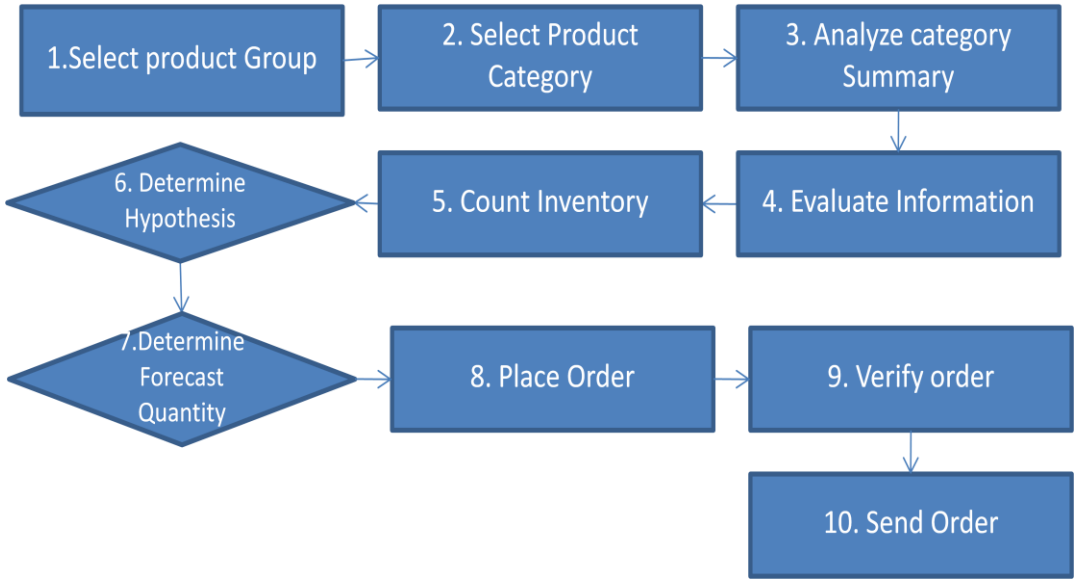


Figure 4.9: Fresh Product Ordering Process

1.) Select Product Group

Though this study emphasizes on short shelf life product (3-6 days), another fresh product group which has longer shelf life (7-21 day) also be concerned to have same ordering standard. So this process is to select product group between fresh short shelf life (3-6 days) and long shelf life (7-21days) product for ordering. Both product ordering processes decided to use same ordering tool.

2.) Select Product Category

Select product category which same category always has same ordering cycle and shelf display area. Ordering process will sequence by shelf display from right to left and top to down. Shelf sequence is the one of the ordering method that fully supports item-by-item management concept. This strategy will enable every product in category to be taken an interest in.

Figure 4.10: Shelf Sequencing Ordering Method

3.) Analyze Category Summary

Category summary analysis is important for fresh product in term of summary of sale in the category. This analysis helps store staffs to know the sale summary of fresh product. This analysis will shown the summary of product sold, product delivered and written off. Trend chart, ABC analysis, special event and all others information that useful for big picture analysis also be included in this summary.

According to attributes of lean supply chain, one of the key attributes is process standardization. All Information analysis process in the study will be designed to have similar standard. These include all store information analysis, headquarter sale analysis and for supplier analysis. The benefits of sale format standardization are to reduce the complexity and to easiness in communication.

4.) Evaluate Information

Store staff evaluates merchandising messages and local event to determine whether there is positive/negative impact to sale at the store. The merchandising are included the nationwide event advertising and promotion while local event are the

information that maintain by individual store. Store staff analyzes weather forecast information to see how it will effect to sale (not effect, positive/negative effect) by considering the relationship between previous weather information and sale

5.) Count Inventory

After analyze category summary and evaluate information, store staff walk to product shelf that selected to be ordered. Store staff starts to count product inventory item by item. The sequence is from top to down and left to right. Store staff inputs quantity of existing product into ordering tool.

6.) Determine Hypothesis

Store staff determines the hypothesis by considering the sale/disposal history/trend, special events weather forecast. Merchandising messages, promotion, and ABC analysis from previous analysis step also have to be concerned. Then determine the hypothesis from all information and environment what will effect to individual product. The hypothesis is based on one day sale quantity. Hypothesis also is determined item by item. Different product has different hypothesis even there are same product category.

7.) Determine Forecast Quantity

Store staff determines the forecast quantity based on the hypothesis (item by item). The forecast quantity is the estimated quantity that would be sale in specific forecast period (1 day)

8.) Place Order

Place the determined quantity into ordering tool. The forecast quantity (F) is used to calculate order quantity (O)

F – I = O formula will be used

While

F = Forecast Quantity

I = Inventory Quantity

O = Order Quantity

The determined forecast quantity will be subtracted by the inventory quantity. The result will be the order quantity that will be sent to Headquarter. The reason why it have to subtract inventory quantity is forecast quantity is based on one day sale hypothesis. Store staff has to determine F as a quantity to be sale in that day. Inventory will be counted as an existing quantity which is not sold yet at ordering time.

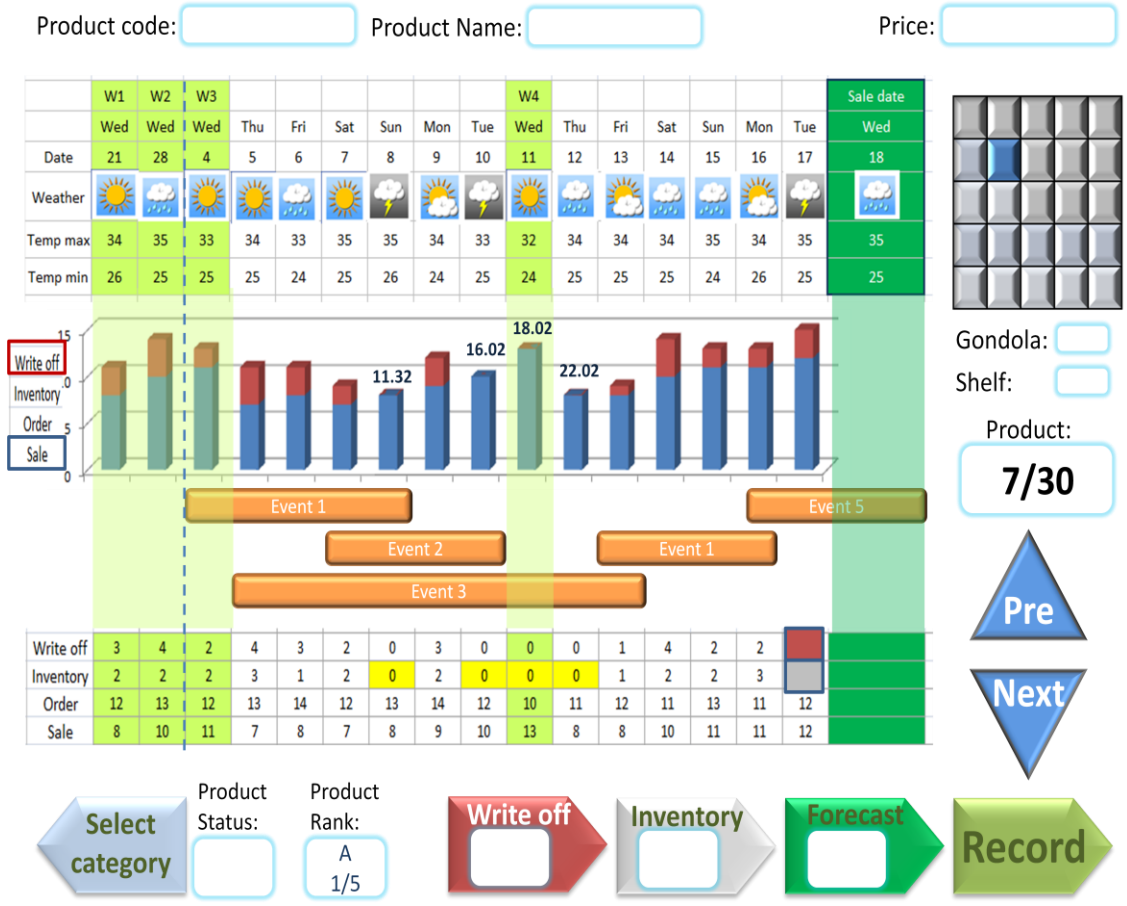


Figure 4.11: Example of Order Screen for Fresh Product Ordering

9.) Verify Order

After order all products item by item in the selected category, store staff verifies order by checking missing ordered items and how many SKUs that already been ordered. Store staff also verifies the summary of all ordered items. For any missing order item or any error in ordering (such as double key number), store staff can fix it by going back to "Place order" process.

10.) Send Order

Store staff sends order to headquarter. Order must be transmitted to headquarter before cut-off time. Then store staff will get the order confirmation from headquarter. The confirmation from headquarter means headquarter already got the order from store and ensure the order for store staff.

4.2.6 Headquarter Ordering Process

The current Headquarter ordering process is basically general ordering process. Order, Delivery to CDC, Receiving, Picking, Deliver to store and product receiving by store. The proposed HQ ordering process will uses seven waste tools to eliminate waste in current process. "Waiting", "Inefficient transport", "Inappropriate processing", "unnecessary motion" are the element to be concerned for process design.

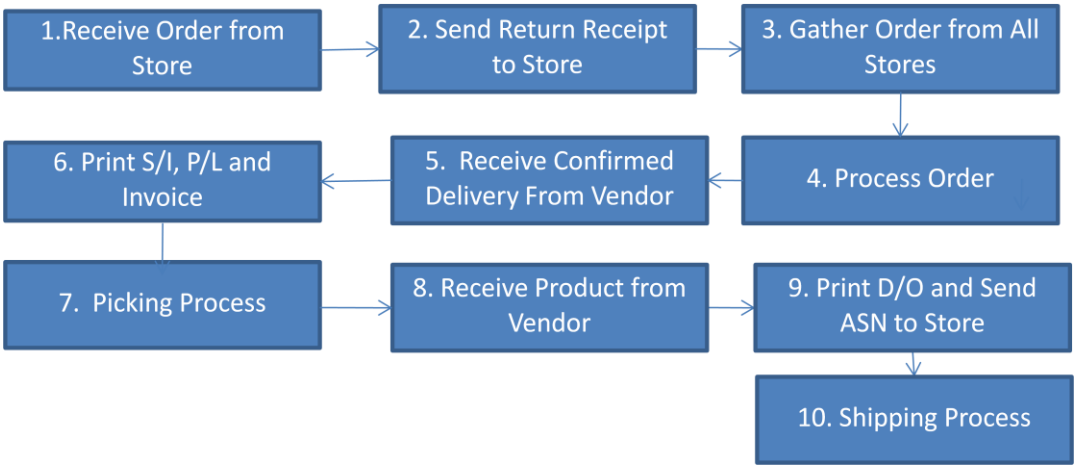


Figure 4.13: Headquarter Ordering Process

1.) Receive Order from Store

Headquarter receives order data from store.

2.) Send Return Receipt to Store

Headquarter send return receipt to store.

3.) Gather Order From all Store

Headquarter gathers order data from all stores.

4.) Process Order

Headquarter checks order data each store (in case it has any human error in ordering such as double key or too much quantity). The process does atomically and alert for order adjustment. Then headquarter generates Shipping Instruction (S/I), Picking List (P/L) Delivery Order (D/O) and invoice.

- S/I and D/O are delivered to CDC.
- S/I, P/L and invoice are delivered to vendor

5.) Receive confirmed delivery form vendor

Vendor verifies the order and checks their capacity and available raw material. Then confirm the order to headquarter. In case vendor cannot deliver product as ordered quantity vendor will send the confirmed (maximum quantity) delivery to headquarter. Headquarter have to reallocate order quantity to prevent product out of stock problem in some store. After that headquarter send the updated S/I, D/O, P/L and invoice to all related functions.

6.) Print S/I, P/L, Invoice

Vendor prints P/L to know how to pick product. Vendor prints S/I to know how to ship the product to CDC and invoice for accounting managing. CDC also prints shipping instruction(S/I) to analyze their workload and prepare area for the delivery before arrival of vendor.

7.) Picking Process

Vendor pick product according to P/L or adjusted P/L. Product will be picked store by store since vendor's process (currently vendor send bulk product then picking by store at CDC). Then vendor moves picked product according to S/I.

8.) Receive Product from Vendor

CDC staffs receive product form vendor. CDC staffs inspect the physical product with invoice. If there are have product short or product damage, CDC staffs issues credit note for vendor.

9.) Print D/O and Send ASN to Store

CDC staff prints D/O (or adjusted D/O after inspection) for shipping process. CDC staff electronically sends Advanced Shipping Notice (ASN) to store. Advanced Shipping notice is the data for store to use for product receiving when products are delivered to store.

10.) Shipping Process

CDC staffs move product to delivery dock as (S/I) Shipping Instruction. CDC staff and deliverer match the product with the D/O hardcopy before product loading. CDC staff loads product into the truck according to S/I routing. CDC staff release product to deliverer with the store by store D/O hardcopy.

4.2.7 Product Receiving by Store

Figure 4.14: Product Receiving Process

1.) Record Delivery Check in Time

Store staff record the arrival time of delivery. Using deliverer code and D/O to record the product arrival time

2.) Receive Product

Deliverer move product into store area. Store staff receives product and places product at prepared area.

3.) Audit Number of Case

Store staff audits number of storage case. Due to the physical of product have to be storage in plastic case in order to protect damage from delivery. Store staff uses D/O that have summary of product quantity and number of case for each store. Store staff psychical counts number of plastic case and verify the case's code to be matched with store code. Auditing just no of case require trust among supply chain participants. Order Information has to accuracy and transmitted to store just in time for receiving. Evident seal like using plastic cover case could be considered to use. Trust among supply would reduce huge cost, lead time from physical counting. Performance tracking system is the solution to track corruption in chain.

Figure 4.15: Plastic Case for Fresh Product Delivery

4.) Sign Product Receiving Document

Store staff signs the product receiving document and gives to deliverer.

5.) Record Delivery Check out Time

Store staff records the departure time of deliverer.

6.) Audit Product Quantity item by item

Store staff physical counts product item by item. Store staff uses ASN (Advanced shipping notice), which was send from HQ, as an initiated data for product auditing.

7.) Confirm Actual Product Quantity to HQ

Store staff records the actual product quantity in to store system. The recorded data will be used for store inventory balance and use will be send to HQ for financial management with vendor.

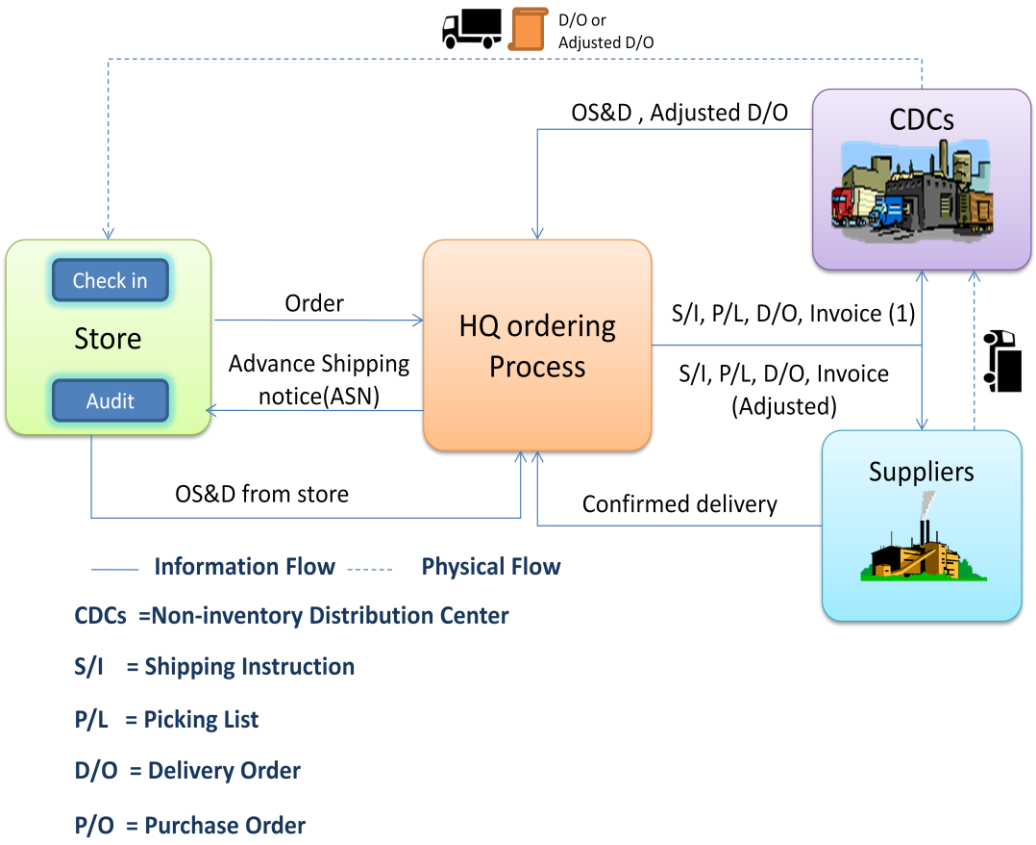


Figure 4.16: Headquarter Ordering Process Diagram.

Above figure illustrated information flow and product physical flow of Headquarter ordering process. The initial orders are from stores. HQ collect ordered data from all stores then processes order and sends to suppliers and CDCs. Afterward, suppliers confirm actual manufacturing volume to HQ. HQ have to process to allocate order incase suppliers cannot delivery as first ordered quaintly. Suppliers manufacture and pick products by store according to picking list of HQ. Suppliers deliver product to CDCs then CDCs pick product to store.

4.2.8 Local Information Log Key in

According to store ordering process, this process needs both HQ supporting information and local information. Initially headquarter have to send the weather forecast information and national event to every store as a supporting information for ordering decision. However, there is possibility that the forecasted weather and the actual happened weather are different. Information log key in is the process that helps store staff can re-entry the actual happened weather into store system. The adjusted information will help store to protect the mislead information on ordering decision.

Another source of information is local event. HQ cannot know in detail that what is going on in particular area. The approach to record local event to be shown in ordering system is to entry the local event into store system by individual. The recorded event will be shown in information supporting screen while store staff is ordering. The local event is one of the critical factors which highly effect on sale. Currently store staffs use their memorial which is not systematic process.

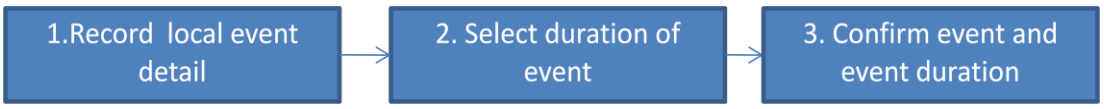


Figure4.17: Key in Local Event Process by Store

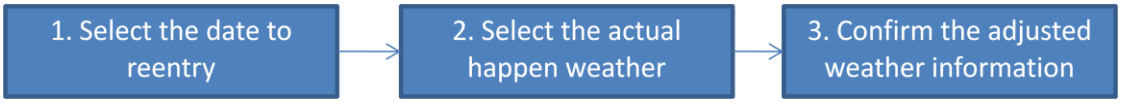


Figure 4.18: Key in Actual Happen Weather Process by Store

4.2.9 Pre-ordering by Customer Process

Traditionally, store staff order product by using history sale and future forecasting to set hypothesis for order quantity. To be more closely to customer's need, the additional suggested process is pre-book ordering. Propose of pre-ordering by customer is to satisfy various pattern of customer's demand. This process could support the strength of firm in term of great number of store and closeness to customer. Some group of customer may need to order lunch box for party, seminar and whatever proposes. The pre- order process would serve exactly customer's need both quantity and item because the order will be determined directly by customer. There will not have waste from disposal in this ordering type.

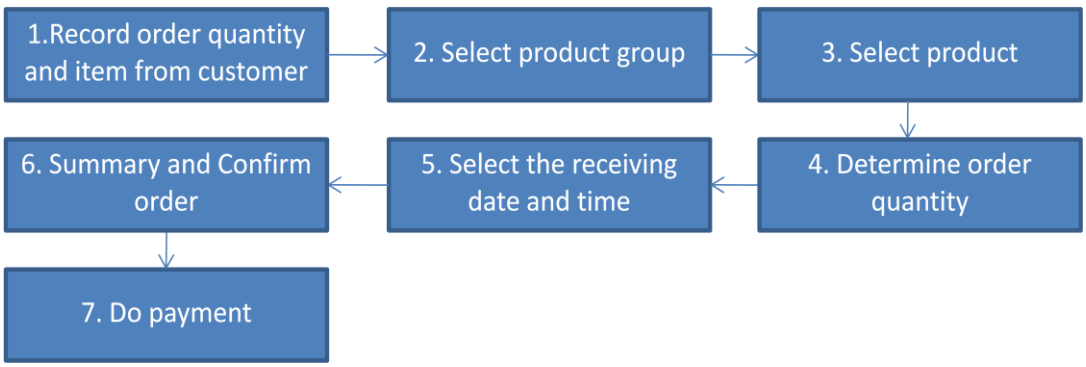


Figure 4.19: Pre-order Process by Customer

1.) Record Order Quantity and Item From Customer

Store staff records the order from customer. (Store staff can order together with customer along all pre-order process.)

2.) Select Product Group

3.) Select Product

4.) Determine Order Quantity

5.) Select the Receiving Date and Time

The system will default the earliest time and date according to individual lead time to store constrain. The arrival date of product can be set as customer's desire.

6.) Summary and Confirm Order

Store staff confirms the ordered product item, quantity, receiving Date &Time and total price with customer.

7.) Do Payment

Customer does the payment according to ordered.

Pre-order processing will be processed like general ordering. The ordered information will be send to HQ and send further to CDC and supplier. The products will be delivered to store according to customer's confirmed date. The sale information of pre-order will not be collected into sale analysis information of store due to preventing mislead in ordering analysis. Pre-order by customer process would enhance sale opportunities from customer that need the specific product with exact quantity by order as actual demand customer.

4.3 Logistics Activities

Current situation of fresh product delivery is quite complicate and have redundant routing. Even the products has same temperature control, there are 2 delivery types which are combining at CDC and send to store and direct delivery by supplier to store. According to 7-eleven Japan corporate outline 20011, the combined distribution system propose is the have greater efficiency. The combined distribution

system is a rationalized system that allows products from different suppliers and manufacturers to be delivered to store in the same truck.

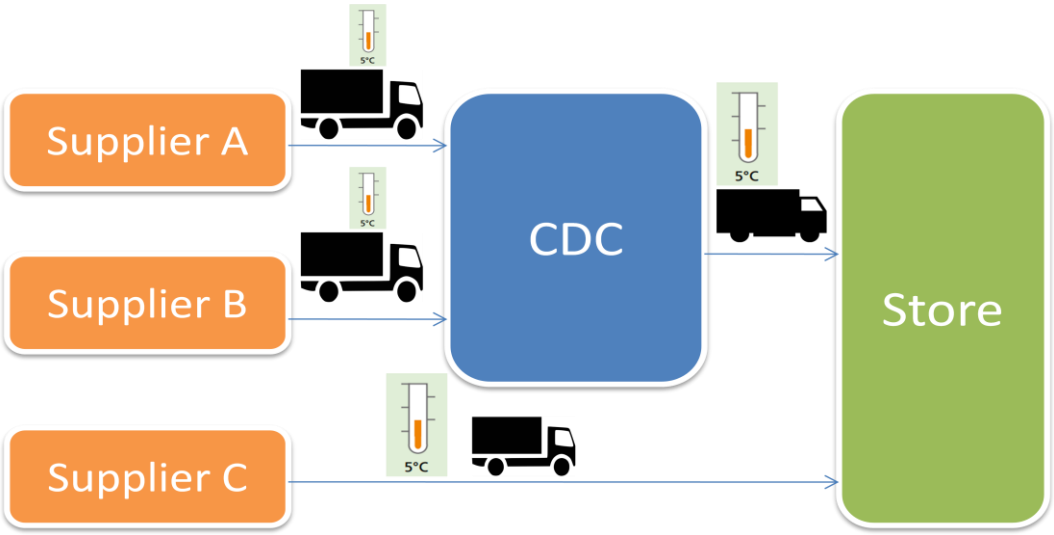


Figure 4.20: Current delivery model

As can be seen from above figure, this figure illustrates the current situation of distribution methods. There is one supplier that directly delivery product to store, even products are controlled at the same temperature (5 Celsius degree) and has same characteristic.

	CDC
Temperature	5 Degrees Celsius
Inventory	No (Cross docking)
Product shelf life	Less than 1 mouth
Delivery Cycle	Daily
Delivery Method	Break case

Table 4.4: CDC Delivery Characteristics

Figure 4.21: Break case Delivery of CDC

This situation leads to inefficient cost and complexity of product receiving at store. The proposed model for this case is simply solution which is combining delivery from suppliers to deliver to CDC and deliver to stores in the same truck. This is the rationalize model which widely used in general distribution model. However from the investigation, the reasons behind why supplier has to directly delivery to store are product shelf life and lead time constrains. So the root cause of this problem is all about time constrain. Long lead-time since order to store is the major obstacle in this supply chain case.

4.4 Technology Supported Working Process

Not only refined working process would improve efficiency, another component that also critical part which supporting designed working process to be operated suitability is technology supporting. Business process design and information technology are natural partners (Thomas H. Davenport and James E. Short 1990)

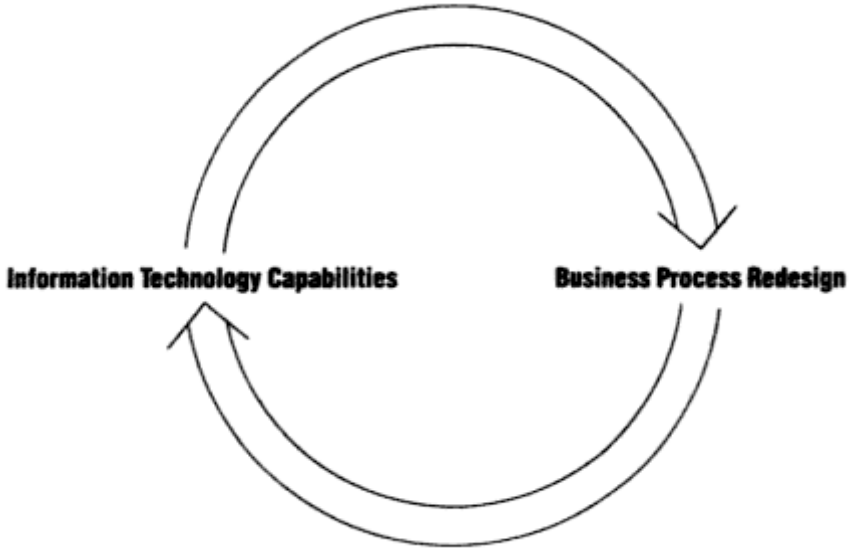


Figure 4.22: The Recursive Relationship between IT Capabilities and Business Process Redesign.
(Source: Operations Management: Critical Perspectives on Business and Management, 2003**)**

IT driven process redesign can be applied to the designed working process. Product introduction, product ordering, product receiving, accounting activities and supplier communication are all the processes that require IT to driven. There are several objectives using IT to support working process which are

Cost Reduction; This is implicit objective to redesign working process and using IT support. Expect result for this study is to help firm to reduce cost from throw away product and waste in supply chain

Time Reduction; Time reduction is another important objective from using IT to support new process. The shorten lead-time would advantage in responsiveness to customer and accuracy of order forecasting.

Output Quality; All processes have output. Tangible product or informational are the example output of process. IT can lead to greater output quality. The accuracy of order forecasting could be enhanced by using IT supporting.

IT also can improve quality of working life. IT can bring out the easiness of working process. Some working process can be automated and some may be aided user to operate easily and efficiently. The repeating working process is rational be standardized and be operated by IT supporting. The process that involves with multiple functions could be benefited by IT supporting. Cost, time could be significantly minimized by using IT support for long run business and output quality could be enhanced.

4.5 Required Technology Devices for Store

Currently, each store has tools provided by Headquarter to process daily operation. Electronic Ordering Book or EOB is the tool used for product ordering and product receiving. Store Controller or SC is the store central system which centralizes all information and process in individual store. Point of Sale or POS is the system that mainly operates on sale its duty is to collect all data when the products were sold.

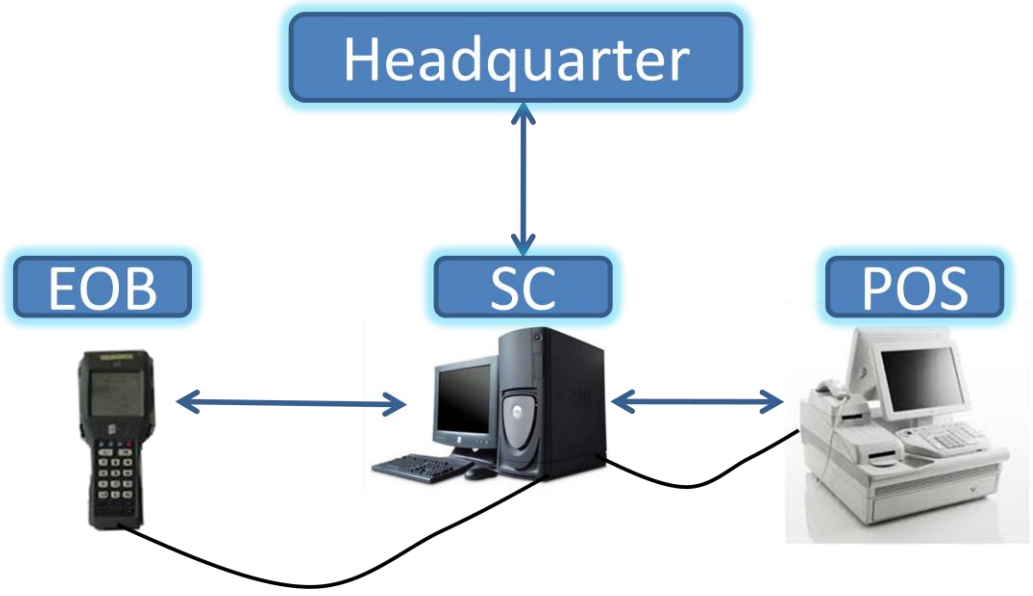


Figure 4.23: Current Technology Supported

However, the current process cannot fully support the designed working process. The proposed processes require more advance tools and technology support to operate. The detail of required technology will be described as below

1.) Point of Sale (POS):

All transaction will be recorded by POS system all send to Store Controller (SC) for using and send to Headquarter. POS information is used in many purposes both at store level and at headquarter. However, the current technology constrain is the frequency of information from POS to SC is limited. There are 3 times per day for information transferring between POS and SC. This is due to the current system and software limitation.

The suggested technology requirement for POS system is to real-time transmitted sale information to Store System. Real time transmitted sale information is the initially requirement the useful for all other function that have to use sale data. The main objective is to have real-time information for analysis to improve ordering process and production preparation.

2.) Store Controller (SC):

The SC is the computer system that is used in store for all related activities. SC linked to POS, all ordering devices and network. It is the center system that communicates all information in store such as sale analysis, inventory, ordering and others. It also integrates to external network to communicate with Headquarter operation system.

The proposed requirement would be the same function but the additional requirement is to have more capability to integrate all devices in store. SC requires having real-time sale and order information transmit. The connectivity of ordering devices requires wireless technology to support real time information analysis. The

information sharing between store and headquarter also need to have suddenly communication and information transmit.

Electronic Order Booking (EOB): EOB is a portable device that use for in store product ordering. It can scan product barcode to collect data for various purposes. This potable device has approximately 3.5-4.0 inch wide screen size. It can show only letter and number on screen. In this case, EOB won't be used for fresh product ordering anymore. Due to limited screen size and display performance, it cannot show suitable and enough information for fresh product ordering. The existing function is only used for product receiving.

3.) Graphic Order Terminal (GOT):

According to Akira Ishikawa, Tai Nejo (The success of 7-Eleven Japan,1998) GOT is an A4-size electronic book order terminal. When comparing with EOB, it has larger screen and can show all necessary information for product ordering. It also can be carried anywhere in the store operate in different places. The fourth generation system of 7-eleven Japan which introduced in 1990s, EOB was replaced by GOT for placing order. 7-Eleven Japan has used GOT until now which is the sixth generation system (Seven & I HLDGS.Co.,Ltd. Corporate Outline 2011).

Figure 4.24: 7-Eleven Japan Graphic Order Terminal (GOT)

(Source: http://www.mgmt.uestc.edu.cn)

This could be ensured that GOT is the device the suitable for ordering product in convenience store industry especially fresh product which requires various aspects information analysis. GOT is proposed device to be used in this study for ordering fresh product. Big screen size benefits for information displaying area. This device can be connected with Store Controller via wireless network. This would benefit on speed of information transferring between SC POS and headquarter. Real-time sale information from POS can be shown in sale analysis on GOT. This could enhance the accuracy of sale analysis. Store staff can carry GOT and walk to product shelf then using information analysis to place order. The ordered information will be send automatically to Store Controller system then send to Headquarter and all related parties. It also can shorten lead-time and reduce work load of ordering process by automatic information analysis and efficient data transmit.

4.6 Integrated Information Infrastructure

All working process could not be operated without integrated information system. Currently, all functions are integrated together. Store, Headquarter, CDC and supplier use technology to support operations. However, the integration is not fully utilizing information from each function. Stores send order data only twice per day (fresh product order) and once per day for sale data. HQ send only collected order from each store to supplier once per day. The degree of information sharing between HQ and suppliers is low due to the confidential issues and lack of technology support. From the investigation, merchandiser using excel file to communicate with supplier on order forecasting. There is no systematic and standard cycle on communication. Order information is pushed from store to headquarter then head quarter push order to suppliers.

The proposed model for this case study requires Integrated Service Digital Network (ISDN). Due to the designed working process require high rate of information transmitting, ISDN is critical fundamental as a foundation for communication between all parties. A huge data from POS and SC have to be transmitted to Headquarter and Suppliers. This also benefits for other product and services.

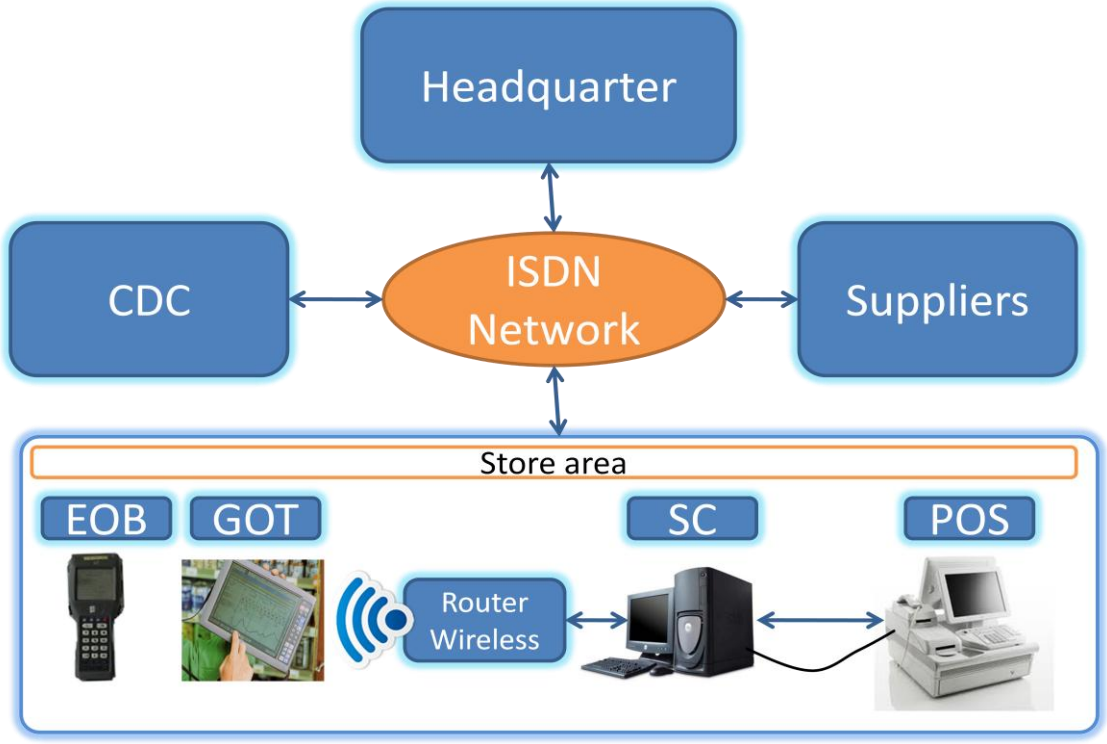


Figure 4.25: Suggested IT Supported Model

4.7 Supplier Collaboration

Supply collaboration is very importance management for the current competitive context. According to Chartered Institute of Purchasing and Supply, it defined that the Supplier Relationship Management (SRM) is "the process for managing the interactions between two entities – one of which is supplying things to the other. SRM is a two-way process in that it should improve the performance of

both the buying organizations as well as the supply organization and hence be mutually beneficial. It involves proactively developing relationships with particular suppliers”

Importance of Supply Relationship

Supplier Relationship Management provides many benefits to suppliers, enterprise and customer. The examples of benefit from SRM are as following:

1.) SRM can lead to reduction of operation cost by eliminating the redundant processes and resources for instance; they can reduce the purchasing process. This leads to total cost reduction by eliminate cost of negotiation, eliminate redundant/overlap functions and processes.
2.) Able to control both quality and quantity. The close coordination will enhance ability to control the quality of product. The demand from customer can be directly communicated to the upstream supplier in order to meet the expected quality level and ideal specification. The variation in communication would be reduced accordingly. Next, if we done both backward and forward vertical integration, we will have the value information for planning such as raw material plans, scheduling/capacity plans and distribution planning. These would help enterprise can forecast ordering and production quantity more accuracy.
3.) SRM benefit for long term supply chain management. In some business quick respond is the critical factor for their business. SRM will help to reduce the lead time or service time to customer. The information integration is an important element in vertical integration establishment. The effective and systematic supply chain management would impact in

operation cost and operation process positively for example, in retail business, inventory is the unnecessary cost. If every firm have the excellence information transferring and integrate together, they may reduce a huge number of inventories in each year.

There are many areas to be developed together with suppliers as following:

4.7.1 Information Sharing

According to Frankel, Goldsby and Whipple (2002), one of the keys to collaboration is enhancing communication between participating supply chain members. Traditional working style is the major obstacle to develop collaboration in chain. The degree of information sharing is limited as described in problem description. To develop communication between all related function, firm has to know what information could be shared for both internal and external parties. There may have some information that should not be allowed to share for external. However, to be a closely and long term partner; trusting is the key factor of collaboration development.

First of all, every party has to setup with the same goals and objectives. Manufacturer, deliverer, distribution center, Headquarter and store are all related that need to have same goal is to serve customer with quality product with sufficient volume at the lowest operation cost as possible. Production planer, logistic function and marketing have to know that what information they want which would benefit their work. Basically, sale data is the information that value for all function. However, there is some information that should be shared to other function to enhance work efficiency. Promotion, advertising and special event are the example of information sets that could highly effect on sale. These set of information is needed to have

systematic information sharing among participants. Production planner could provide more raw material than usual while it has big promotion campaign. Logistic may forecast delivery capacity more accurate if they got enough and useful information. Store staffs also can forecast order quantity more accuracy if they get enough information support. The proposed model of information between store, CDCs and supplier is centric information system. The information to share and to be shared will be centralized. Each function can access the information as it necessary and it is allowed. As can be seen the following figure.

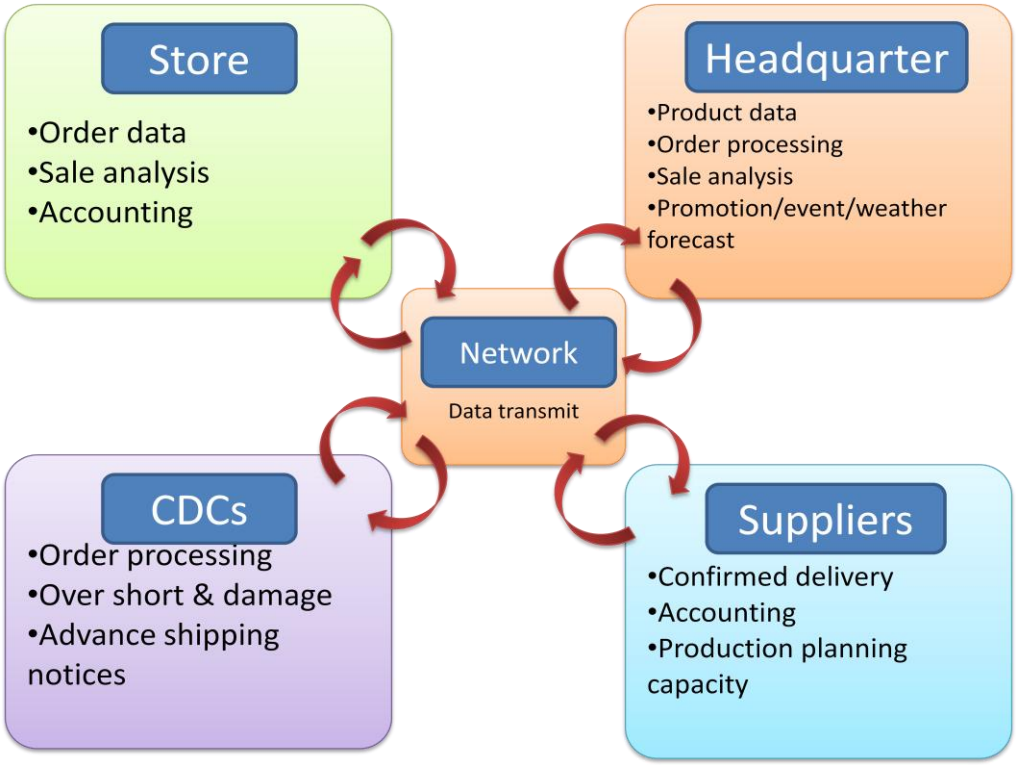


Figure 4.26: Information Sharing Among Participants

4.7.2 Ordering / Production and Workforce Forecasting.

As point out by Frank Chen, Zvi Derzner, Jannifer K.Ryan and David Simchi-Levi, 2003, the bullwhip effect is a major concern for manufacturers, distributors and retailer because the increased variability in the order process. It leads to inefficient use of resources due to the fact that it is not clear whether resources should be planned based on order quantity.

For this study, bullwhip effect would not directly affect on over-production or excess-inventory due to it is made-to-order production. The mainly effect that probably happen from bullwhip effects for this study are increasing of operation cost and inaccuracy of order forecasting. No coordination and lack of communication up/down the supply chain are the factors that contribute to the bullwhip effect .Sharing of necessary information across the firm can help to reduce risk of bullwhip effect occurring. The problem also can be quickly solved when the problems occurred before it affected customer.

4.7.3 Standardized Information Analysis

Currently, the information analysis in this chain is not using same standard even internal information analysis. From investigation, Store and headquarter using different information system analysis. It makes a trouble for communication. For external communication, there is no standard system for communication too. Mostly is communicating via mailing and excel file. To be a long term partnership, process of communication should be standardized. The benefit of information standardization is reducing sophisticate of communication and information analysis.

4.7.4 Technology Supporting Partnership

To collaborate supply chain effectively, technology system will enable information exporting/importing between participates. Information transferring can be managed by Electronic Data Interchange (EDI). According to Kenneth W. Copeland, 2011, EDI is the computer-to-computer exchange of business data. It conducts business transaction electronically. EDI improves the accuracy and speed of transmitted information between companies. Many businesses choose EDI to sending purchase orders, invoice, payment and others. Data from store (POS) is important for supplier especially for food industry supply chain. Excellence information sharing could assist the collaborators in making better decisions.

Another important technology that supports supplier collaboration is ISDN (Integrated Service Digital Network). ISDN is an information network that links all stores together. It provided two-way, high-speed on-line communication capability of ISDN enabled Seven-Eleven Japan to collect, process, and feedback POS data quickly. This network was set up in 1991. Seven-Eleven Japan spent 2.4 billion yen setting up this network (SUNIL CHOPR, 2005). ISDN is the critical infrastructure which supports information sharing strategy. Supplier can closely monitor sale of product to decision on their production planning. It also benefits distribution system, ordering and accounting system.

4.7.5 Category Management

Above article explained about process, information and technology to support collaboration. Another aspect to be concerned is collaboration working approach. According to Dirk Seifert, 2002, Category Management (CM) is defined as the joint process of retailers and manufacturers through which categories are managed as

strategic business unit in order to increase utility for the customer and thereby revenues. Every participant has same goals but they have individually different responsibility. Though they have goal, Point of view and individual goals may different. Category Management requires activities consideration of the whole system from manufacturer to logistic to retailer and to consumer.

All participants have to clearly understand firm's goal and strategy. For example, assortment process is the never be used process before so every function have to understand the characteristic of product assortment that stores are empowered to make decision on sale. So information analysis has to be more in detail which totally different from forced-sale strategy. All participants have to indentify who is target group and what is the product segmentation is. If they know who the customer is, they would manufacture product according to consumer's behavior. Flavor, pack size and etc. for specific group of customer will be more responsive. Clearly role & responsibility

CHAPTER V

IMPLEMENTATION APPROACH AND EXPEXTED RESULT

5.1 Introduction

According to project scope, implementation phase is not included this study. The deliverables from this study is the proposed working process/concept which suitable for current business context. However, this study will propose the implementation approach as guidance for ABC Company which will be described below:

5.2 Change Management

As can be seen from chapter 3, there are many working processes and technology supports that designed to improve the efficiency. To change the traditional working process, it require methodologies to be accomplished Firstly, top management it is an important driver to change the business strategy, vision & mission and direction of cooperate in order to remain as a leader in this business. These changes cover almost areas of organization. Working process of both headquarters and store has to be changed. The roles responsibilities will be changed to conform to the new working process. Technology and supplier collaboration also be developed. These will change a lot of working processes that had been operated for a long time. The concept of doing business also will be changed to be more proactive than the current. To be ready for dramatic improvement, there are many tools and techniques that will be used in this big change.

5.2.1 Project Management

First of all, the essential tool that would be used is project management. Project management will be used as a foundation tools and can be adapted to use with other tools. The useful of project management is to identify, prioritize and control the actions or activities in change management. This tool will help to structure framework of change. It would benefit to top management level to know the framework and time line of change project. For the operational level employees, project management would help them to know the detailed activities to accomplish the goals. This tool will help everyone to know the big picture of project and also help to determine time frame from the beginning to end.

5.2.2 PESTLE Analysis (External Analysis)

Second tool for change management is PESTLE Analysis. PESTLE Analysis is a standard tool for understanding the context of Political, Economic, Social, Technological, Legal and Environmental that forces the organization direction. It will help to illustrate the future scenarios that might happen.

Below is PESTLE analysis of change management project of ABC Company

Political 	• There are no any key point that affect on the future plan and business strategy of cooperate
Economic 	• Thailand Future Economic is hard to predict. However economic has less effect on convenience store industry even economic recession. • Increasing of energy price is considerable on model of distribution.

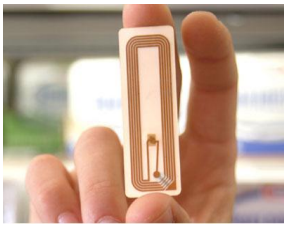
Social 	• The changed business process must respond the localize social in each part of Thailand individually. • Study the local living & eating style of each part of Thailand, for instance, North East people like the spicy food and South people don't eat pork much because of Muslims religion. • Distribution of population has to be concerned in order to decide store/DC expansion strategy.
Technological 	• Every latest technology, which relate on business, must be accessed by team in order to have the best technology for new process with the reasonable cost. Such as high speed internet provider (ISDN) Tablet device that appropriate to operate at store. RFID technology (Radio Frequency Identification) will be considered to be used to enhance logistic efficiency.
Legal 	• Legal on tax/vat to support online accounting instead invoice hard copy.
Environmental 	• The paperless concept will be used in every part of new business process • The transportation concept will be changed to reduce the energy consumption and pollution emitting.

Table 5.1: PESTLE Analysis

5.2.3 Internal Analysis (SWOT Analysis)

After doing external analysis (PESTLE Analysis), the internal analysis also need to be done. According to "Change Management Master Class" book of Mike Green, "The point of a SWOT analysis is to ensure that key strengths and weaknesses within the organization, and key opportunities and threats from without, are

considered, prioritize and addressed. One of the main aims is to identity whether or not there is an imbalance between an organization's current capabilities and future needs.

1.) Strengths

- Strong training system and facilities and has systematic providing store staff.
- Greatest company in convenience store industry.
- Strong management team

2.) Weaknesses

- High turnover rate of store staff due to too much work load
- Lack of information sharing among business partners
- Inefficiency information utilization on product development

3.) Opportunities

- Stores locate all important area and closeness to customer.
- Opportunity to sell more variety of products.
- Continuous store expansion.

4.) Treats

- Silo-working style and big organization structure lead to clumsy management
- Constantly change of customer's behavior

5.2.4 Prosci's Change Management Toolkits

After business processes & concepts were designed completely, the following process is implementation of new processes & concepts to organization. If the new processes & concepts are implemented without change management concerning,

project may not successful and bring out problems while implementing. Change management has to be concerned to develop plans for each function. Prosci's change management toolkits is one of the most comprehensive guides for managers, project teams and consultants involved in change management (Change Management Learning Center ,2008). Prosci research divided change management into 3 major phases:

Phase1: Preparing for change: Building the foundation for managing change. Access the impact of change management and develop the team structure and sponsorship model

Phase2: Managing change: Develop the change management plans which include sponsorship, coaching, training and resistance management. Create detailed plan for implementation and implementation.

Phase3: Reinforcing change: Access the result of change management implementation. Determine the problems in change and how to solve these problems.

The 3 phases are as following figure:

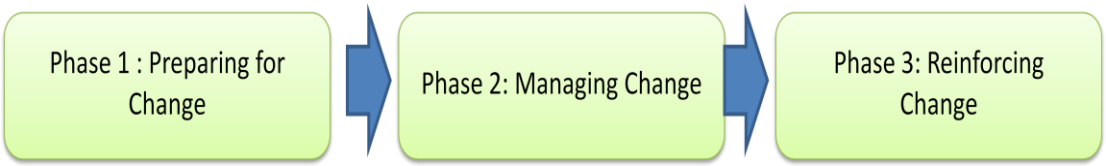


Figure 5.1 Change Management Process

Phase1: Preparing for Change

Step1.1: Define your Change Management Strategy

Due to the change will be implemented in organization that has various knowledge and levels, the change management strategy should be determined

appropriately with the specific functions and levels. There are 2 major levels of employee, which will be classified for change strategy, are headquarter and store.

Change management for headquarter employees, the change management strategy will more complicate than the store level because there have a lot of functions which have different role & responsibility. The strategies for headquarter people are:

- Back to Store Program

The approach of this program is to send the headquarter employees to work at store. The purposes are to make them realize and understand the store operation. They could get some problems understand exact operation context, and then they could improve the business processes according to their working experience as a store staff. This program would help to close gaps of work between headquarter and store. However, the main objective is to make headquarter employee to realize and change their mind set form “headquarter” to “store supporting” function. Their new role is store supporting in order to have smooth operation at store.

- On the Job Training

According to current company’s context, it found that the traditional training style, which is short training course by job-unrelated trainer, is inefficiency training. The problem is training course period is too short and has plenty of contents. It also difficult to adapts to use in practical work life. So the appropriate approach for training is to train by job supervisor. The new role of supervisor is to become a trainer for their command line. Trainers (supervisors) will be trained the training techniques & tools and they have to adapt with their working experience to train store staff. Leadership of supervisors in organization has to be more focusing.

The strategy for store staff is:

- Establish Religion Store Model Training Center

The new business processes require lot of training sessions. Current training center located in Bangkok which may not enough capability to train more than 40,000 employees in specific period. The strategy is to decentralize training center store model into each region. Store staffs will be trained by practicing work in training sessions. This will help them to understand new business process than classroom training session. They can study theory then practice immediately due to training room is beside store. After complete training, store staffs will back to work at their store. The well-trained staffs have to coach other staff according to new working processes.

Step 1.2: Prepare your Change Management Team

Change management requires specific responsible team to manage. They must have a clearly role & responsibilities. Team member must be selected appropriately and conform to change strategies and plan. For the headquarter side the organization will be separated by function while the store operation will be divided by religion or geographic.

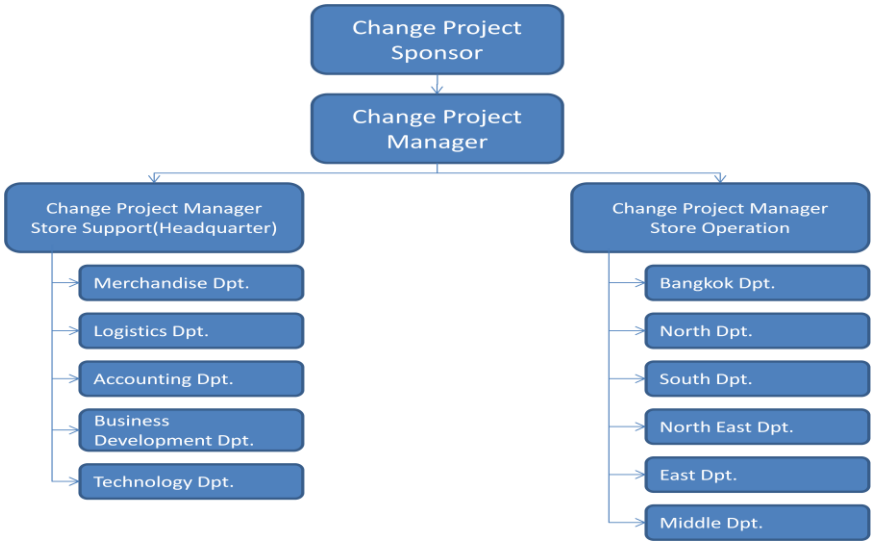


Figure 5.2: Drafted of Change Project Team and Organization Structure

Step 1.3: Develop your Sponsorship Model

One of the project success factors is sponsorship. Top management is a group of person which support and track project. Naturally, big impact project have cross functional resources form many functions which may have conflicts while implementing project. Sponsorship would effectively drive and solve issues along project duration.

Phase 2: Managing Change

Step 2.1: Develop Change Management Plan

Project plan is the master plan that details project tasks with timelines. Project plan is useful tool for top management to monitor project progress according committed deliverables in each phase. It also useful for project team member to know the indentified the working task that they need to accomplish in each period.

Step 2.2: Take Action and Implement Plans

The implementation plan is divided into 2 major plans regarding to the change management strategy steps (headquarter, store).

Firstly, For Headquarter, there is pilot test a project. The participators are from nominees of each function. The result of pilot test will be evaluated and revised if it has any issues to be concerned before fully program implementation. First pilot test project is “Back to store program” then “on the job training” will be implemented.

For store side, pilot training store need to be established to support pilot project. After that implement pilot project, then evaluate and revise pilot test result. Then if the revised implement methodology were completed, the implement change program will be deployed into organization.

Phase 3: Reinforcing Change

Step 3.1: Collect and Analyze Feedback

During implementation period the implementation teams have to collect and analyze feedback from employee via questionnaire, suggestion box or others.

Step 3.2: Diagnose Gaps and Manage Resistance

Implementation teams use the data to determine the weak points in program and improve the program to be suite for employee in organization.

Step 3.3: Implement Corrective Actions and Celebrate Successes

The corrective actions will be implemented. This process will be done frequency through project period. The program is able to be changed all the time in order to appropriate with the most current context and environment.

5.3 Expected Results

Objectives of this study would to design working processes that align with current business direction, product's characteristic. Moreover, to reduce non-value added activities and to propose the approach can to reduce waste from writing-off.

All processes were designed base on business strategy which is "to be a convenience food store". The first major objective of designed processes is to reduce non-value added activities. New processes tend to reduce the redundant processes and inappropriate activities by using technology support and refining collaboration approach. Technology support would enormous reduce waiting time and inappropriate process. New ordering process significantly be improved in term of eliminating non-value add processes as following table

	Current Process		New designed Process	
Ordering Processes	Bi-monthly activities (Min)	Daily activities (Min)	Bi-monthly activities (Min)	Daily activities (Min)
Prepare order sheet	210	-	0	-
Evaluate HML	5	-	0	-
Evaluate ABC Rank and write down information	15	-	0	-
Shelf display and register	47	-	47	-
Count inventory product	-	29	-	Simulation ordering 30 sec per SKUs 0.5 min X 97= 48 min
Order product	-	34	-	
Scan barcode and key in order quantity	-	12	-	0
Sync ordered data to store computer	-	7	-	0
Summary average lead time	277	82	47	48
	Bi-monthly activities (Min)		Daily activities (Min)	
Approximate saved time	230 min		34 min	

Table 5.2: Current Vs Expected Lead Time of Ordering Process

The result shows the reduced lead time by eliminating non-value activities from new process designing and technology supporting. The information preparation process which will be done bi-weekly cycle was improved by automated information analysis. Daily process also be improved by eliminating inappropriate and redundant process. Approximate reduced time form this study is 34 minutes per day per store. If

multiple with current no. of store approximate 6,000 (June 2012), the total reduced time would be 3,400 hours per day or 1,241,000 hour per years. The improved process at store level would highly effect on total workforce of cooperate due to large number of chain store. Though, it may not directly relate on labor cost saving, the reduced workforce would benefit on other activities such as better customer services.

Another major objective is reducing waste of writ-off product. As described in problem analysis, current write-off rate is approximately 16-17 % of sale. Mostly are caused by inappropriate ordering process and insufficient information supporting. Using new ordering process (item by item management and technology and tool enable) rather than current process (mostly manual and worksheet operation), would improve the accuracy of order estimation. Accordingly would reduce writing-off rate.

New working process and technology enable could help to reduce waste by optimizing order forecast reducing gap between predicted sale and actual sale. Weather forecasts, historical sale, merchandising information and others are the key point to help store staff to have better decision on order forecasting. Another major cause is waste form low potential product that was forced to be sale in store by headquarter. There are no empowering processes for decision to delist low potential product from store. Both are major causes of waste. Currently, approximate waste from inappropriate ordering is worth about 14% of sale which approximates 45 million Baht per month. While waste from forced sale item is approximately 2% of sale (5 million Baht per month). The details of waste data are as following table.

		Month X	Month Y
Sale (Baht)		322,325,458	330,788,341
Overestimate ordering waste (Baht)	Total	46,324,233	44,200,637
	Percentage	14.37%	13.36%
	Approximate per store (5,500 Stores)	8,422 Baht/Month	8,036 Baht/Month
Lack of product assortment process waste assortment (calculated from write off worth of product that greater than 29 % which is gross profit rate)	Total	4,330,189	6,589,284
	Percentage	1.35%	1.99%
	Approximate per store (5,500 Stores)	778 Baht/Month	1,194 Baht/Month
Total waste (Baht)	Total	50,654,422	50,789,921
	Percentage	15.72%	15.35%
	Approximate per store (5,500 Stores)	9,200 Baht/month	9,230 Baht/month

Table 5.3: Sale & Classified Waste value

Due to this study does not include implementation phase, the result would be the estimated result from historical information. The expected result from implementation could refer to the pilot test result on similar ordering process. The pilot test was implemented in 16 stores by fully headquarter controlling on short shelf life product ordering process (as described in Chapter I Page 9-11). The pilot test is controlled by headquarter on step by step ordering. The results showed that in fully controlled situation on order forecasting can reduced waste approximately 4% though

based on current ordering process which has many problems and constrains. So 4% is implied conservatively as a minimum waste reduction target from improved ordering processes for this study. While waste form lack of assortment empowering could be totally reduce to zero waste. In summary, the expected minimum waste reduction value from this study would be about 5.7 % reduction of sale which worth about 18.5 million Baht per month

		Approximately waste before implementation	Expected waste after implementation	Different
Overestimate ordering waste (Baht)	Total	45,262,435	32,200,637	-13,199,546
	Percentage	13.8%	9.8%	-4%
	Approximate per store (5,500 Stores)	8,422 Baht/Month	5,854 Baht/Month	-2,567 Bath/Month
Lack of product assortment process waste assortment	Total	5,459,736	0	-5,459,736
	Percentage	1.67%	0	-1.67%
	Approximate per store (5,500 Stores)	986 Bath/Month	0	-986 Bath/Month
Total waste (Baht)	Total	50,722,171	32,200,637	-18,521534
	Percentage	15.54%	9.8%	-5.67%
	Approximate per store (5,500 Stores)	9,215 Baht/Month	5,854 Baht/Month	-3,361 Baht/month

Table 5.4: Expected Waste Reduction Value

5.4 Expected Advantage and Disadvantage from Implementation

There are many aspects that could effect on sale, operations and Etc after the implementation. Changing working process has both benefit and drawback to be concerned as following summary table

Changes	Advantages	Disadvantages
New Policy Change to be more empowering in product assortment	• Benefit for long term Business. • Reduce conflict between HQ and Store • Dynamic information usage	• Require intense training program (Big Change) • Risk on inconsistent skill of store staff • Risk on bullwhip effect from store
New Ordering process	• Shorten lead time • Better information analysis • Expected waste reduction	• High investment on infrastructure and tools • Risk on sale opportunities loss
Store Assortment	• Expected waste reduction • Engagement staff by ownership • Availability of Right product at right store	• Inconsistent skill of store staff may mislead decision (inactive decision) • Problems in production planning • Effect on nationwide marketing strategy • Lower degree of product variety
New Logistics approach / technology support/ collaboration	• Shorten lead time • Cost reduction (long term) • Greater information sharing among related functions • Creating mutual benefits	• High investment on infrastructure and tools

Table 5.5: Advantages and Disadvantages of Suggested Working Processes

CHAPTER VI

CONCLUSION AND DISCUSSION

6.1 Conclusion

The factor that drives author to study problems in ABC Company is from the tending to be “Convenience Food Store” business direction. This is seem the general business direction and easily for implementation. However, practically current organization contexts, which are working process, facility, logistics, technology support and etc, lack of readiness to operate according to business direction. Though fresh food products were introduced for sale in Bangkok area for a while but there has created lot of problems and wastes. The actual root cause could be current business processes which were designed to support only grocery product or long shelf life products. ABC Company has no experience on very short shelf life product (1-3 days) sale. Fresh products such as Milk, Sausage and others have longer shelf life and have similarity management with long shelf life product. The risk to be disposed is lower than short shelf life product. From disposal product data, it showed a great number of waste from write off product. The analysis showed that major causes of waste are inappropriate ordering process and strategy constrain on force sale strategy. So designing new working process/ concept to support strategic product like fresh product could be rational studying and reasonable for implementation.

The primary goal of this study is to transform working process and concept in order to have the comprehensive solution that conforms to product and current business context. The proposed processes approach is trying to eliminate inefficiency processes which occur through current supply chain e.g. waiting time, information utilization, redundant activities and collaboration with supplier. These create both

mutual benefits and individual benefits. Consumer profit is satisfaction from product and service while retailer and supplier also gain benefit from efficient processes.

Customer	ABC Company/CDCs	Suppliers
• Product Freshness • Satisfied by assorted product • Availability of product	• Reduced lead time/ work load processes • Efficient working processes • Waste and opportunities loss reduction. • Greater respond customer • Lower costs and higher revenue	• Reduced lead time/ work load processes • Better production planning • Reduction of raw material inventory • Greater information utilization • Lower costs and higher revenue

Table 6.1: Benefits for Each Function

To summarize the major change in this study, there are deliverables from this study are as following:

Right Product at the Right Place

The limited store area is major constrains for convenience store industry. ABC Company cannot hold all SKUs for sale, so there is an operation to select the “Right Product” for selling in the “Right Place”. The working process to select the suitable products called “Product Assortment”. There are 2 levels of assortment. Firstly, “HQ assortment” is a process that Headquarter (HQ) will suggest the products that have potential for sale in store by “Area concept”. The “Area concept” means that some product may not be suggested to North of Thailand because this product is not suit or have very low potential in North area. The benefit of HQ assortment on area concept is can reduce operation cost and junk information. After that, the product that was suggested to store, will be selected or not selected by store staff decision. This process

called “Store Assortment”. Store staffs filter products to have only suitable products for each store. Store assortment also included delisting slow moving product by using efficient supported information analysis which done by both function (store and headquarter). These processes will enhance a chance to have only “Right Product”. Accordingly, product will be selected for sale only in the “Right Place” which has potential for sale. There also reduce a chance to have waste form unsuitable product by sale only in the “Right Place”

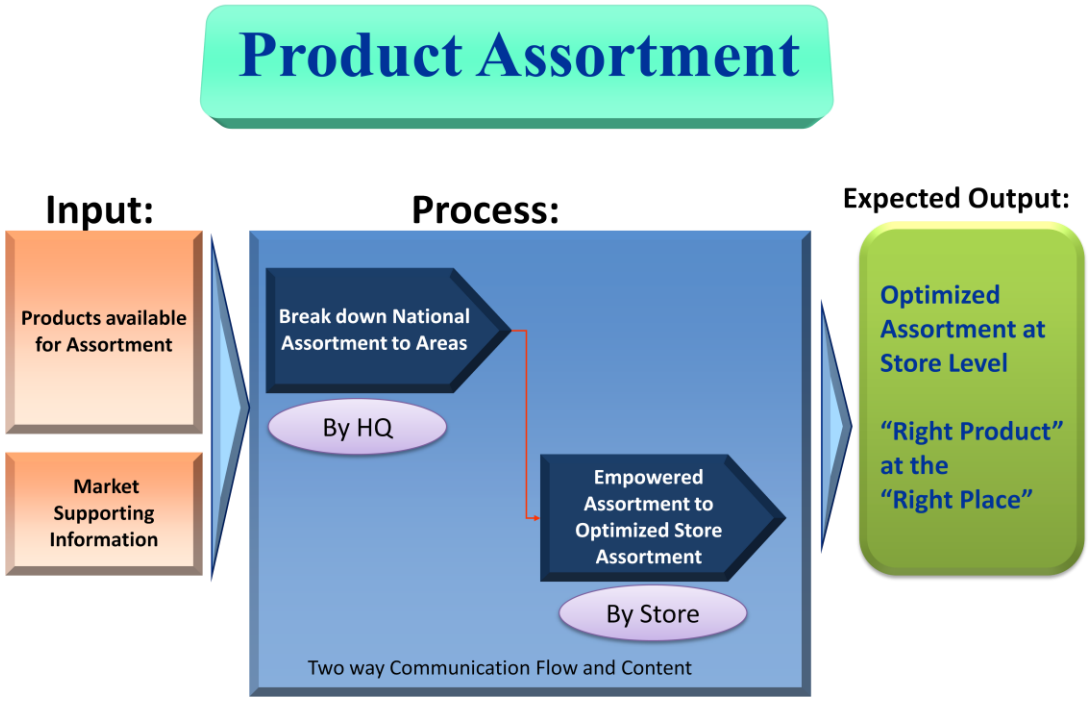


Figure 6.1: Summary of Product Assortment Mechanism

Right Time

Right time is means availability of product for customer. Product is needed to always available for serving customer. The process to replenish product at store called “Store Ordering Process”. Ordering process is very important because it may causes out of stock or excess product problem. Waste and opportunity loss are 2 major classic problems in retail business, however these problems can be mitigated by using

information support via friendly ordering analysis in order to have more accuracy forecasting. Store Staffs can analyze sale history data and estimate future event plus with other support information to determine suitable order quantity. The ideal objectives of ordering process are to always have products on shelf at the right time for customer with the optimal quantity.

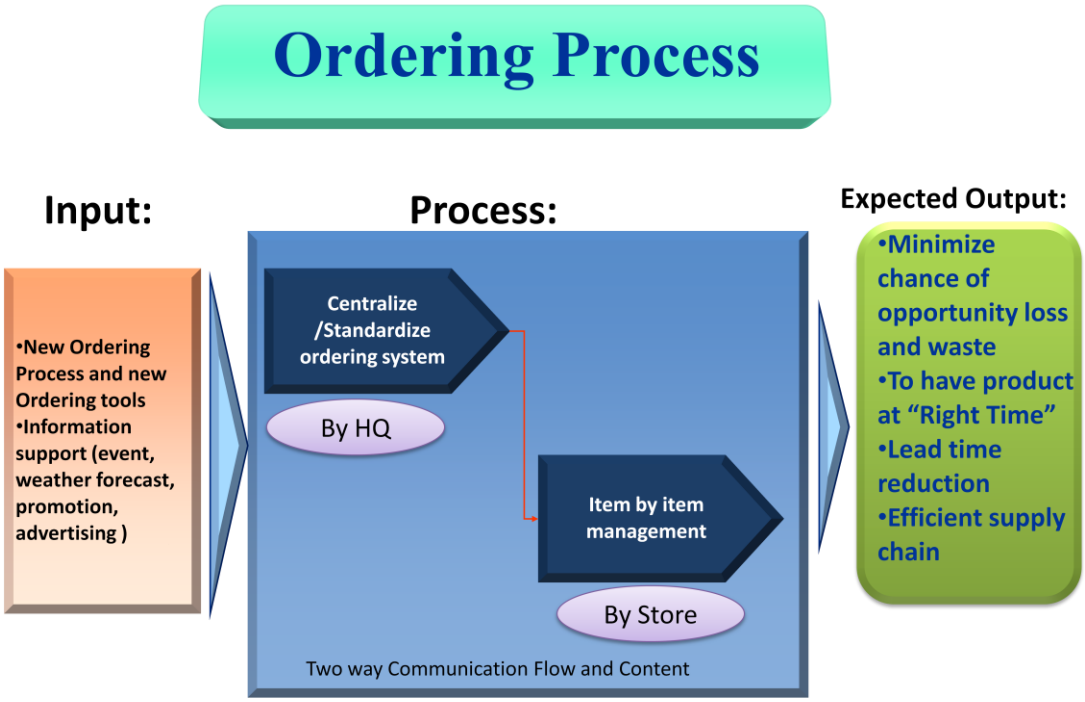


Figure 6.2: Summary of Ordering Process Mechanism

Push Principle to Pull Principle

The current supply chain was dominated by push principle. This is the traditional supply chain that order was pushed from customer to headquarter and to suppliers. This could lead to unsynchronized production/ supply management. The problem is lack of enough information for any decision in supply chain. The proposed approach form this study is to change from push to pull principle. Sale data or

consumer buying behavior can be pulled from store via high speed internet system to center computer system for demand consideration. Sale information from POS can be transmitted real time to all participants in supply chain. This could be beneficial information for all related functions. This approach could change the old-fashion working style to be more focus on customer demand. The improving information utilization in supply chain could lead to change business concept from “Product Driven” to “Customer Driven”

Supplier Collaboration

Generally, working between participant always lead to conflicts from having different objectives and goals. Every party in chain surely tries to minimize its own operation cost. However, one unnecessary cost is from lack of trust in any linkage activities. Neither Long term business plan nor daily operation currently has enough collaboration. This situation leads to hidden cost from redundant processes. Setting same goals and objective could lead to total system efficiency. Long term plan of facility expansion should be collaborated and determined in the same direction. For supply chain management, it needed collaboration to have leanest process as possible. Standardize information analysis would help participants to have same standard for working together. Centralized ordering system also helps to reduce the complexity of working and have efficient process. High degree of collaboration would enable to accurately predict demand. It also leads to minimizing cost from cutting of redundant operation and overlap resource in supply chain.

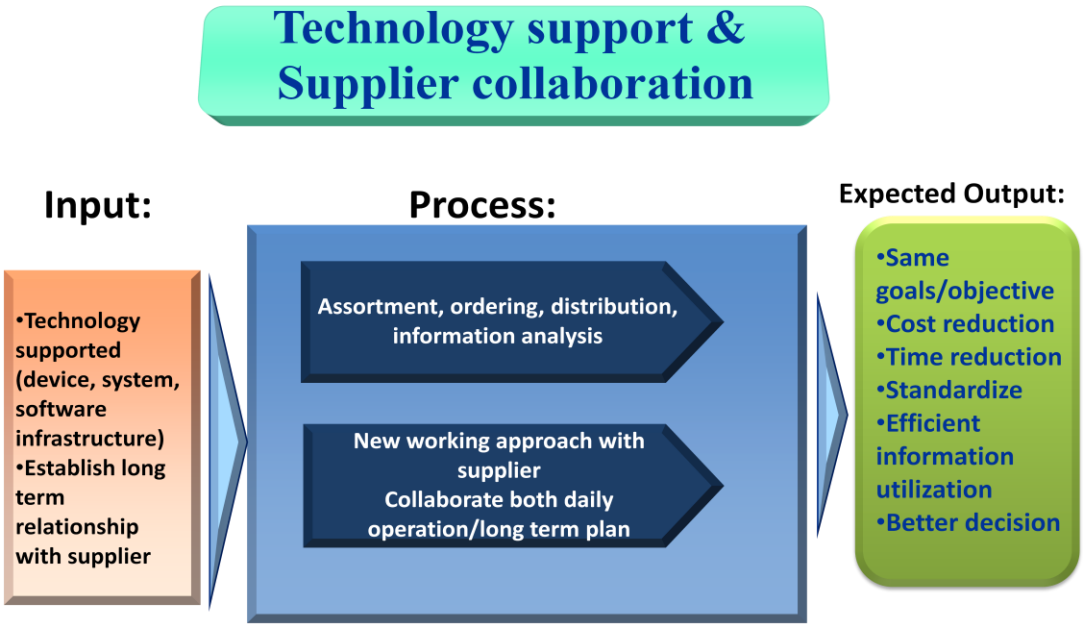


Figure 6.3: Summary of Support functions Mechanism

6.2 Suggestion

As changed business context and customer behavior, the management supposes to be changed accordingly. The growth of business and expansion of store which coverage nationwide area divers. In my view, "Decentralization and empowering are the key principles for managing convenience store industry. Product management, distribution management, training and others need to be decentralized and empowered to each region for flexibility in management. Centralization concept would not appropriate with big organization. The suitable strategy is to decentralize and support efficient information to make decision. The management should base on individual location, geography and context.

Next suggestion is on ordering process, the purposed processes and tools for ordering short shelf life product can be adapted for another types of product. According to problem descriptions, it referred to waste from long shelf life fresh products which are quite a lot of waste. Approximately, sandwich category has 19

SKUs, sausage/burger and others has nearly 250 SKUs, milk category has 149 SKUs. All of these product groups are treated as grocery product. The efficient information support on big screen device would benefit for other category. There may have different order cycle/forecast period but the ordering concept is standard. Other products are also possible to be ordered via this device. The graphical information analysis would help to has better decision making than using numerical analysis. Excess inventory and out of stock problems would are less chance. In addition, the cooperate target to optimize product sale and waste rate at 10% of sale probably to be revise. To be more challenge on waste reduction, lower than 10% is probably practical business. Reason of targeted waste at 10% is in order to prevent opportunity loss of sale from unattractive product display. This problem can be solved by closely in-store management. Study customer's behavior in particular time and manage suitably individually on product displaying techniques. Another suggestion is to discount product before it going to be a waste (accounting system constrain and fraud concerning). This approach would can reduce waste and help environment.

The integrated information sharing and technology support benefit not only for fresh product group. This technology infrastructure investment also is foundation for other management. Grocery supplier also needs to closely monitor sale information than just receive bulk order. The supplier collaboration should be implemented with any supplier. Basic Mutual benefit is to minimize total cost via efficient supply chain. Basically, the establishment of common goal and objectives can do with any supplier. The willingness in supply chain would deliver efficient operation/ less cost and better satisfy customer.

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Appendix

Interview Questions

For Merchandise function

1. Explain current new product lunching processes
2. Fraction of Fresh products and grocery goods?
3. The strategy on fresh product/ long term plan/ regulation / write off allowance
4. How many current short shelf life product SKUs?
5. What is current implemented fresh product store area?
6. Approach to discontinue slow moving product?
7. Vary of shelf life of fresh product?
8. What is supported Information store and is the channel and frequency.

For Store/ Logistics

1. How many delivery type and delivery cycle.
2. Where the CDCs located?
3. What is cut-off time order?
4. Approximate lead time of each task since order from store to product delivery
5. Explain ordering process
6. Approximate lead time for product ordering
7. What is information used for ordering?
8. Explain Current Supplier Relationship

BIOGRAPHY

Mr. Chittapol Sakavutanudej was born on August 4, 1981. In 2000, he finished his high school from Saint Gabriel College School. In 2004, he graduated with a Bachelor of Engineering in Industrial Engineering, Mahidol University (Thailand). In May of 2009, he enrolled as part-time student of the Regional Centre of Manufacturing Systems Engineering for the Master of Engineering in Engineering Management from Chulalongkorn University (Thailand) and Master of Science in Engineering Business Management from the University of Warwick (United Kingdom).