One-Stop Supply Chain Solution

by

Mr. Natjapak Vetviriyakul

A Final Report of the Six-Credit Course
IC 6998 E-Commerce Practicum

Submitted in Partial Fulfillment of the Requirements for the Degree of
Master of Science in Internet and E-Commerce Technology
Assumption University

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Project Title: One-Stop Supply Chain Solution
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The graduate School of Assumption University has approved this final report of the six credit course, IC 6998 E-Commerce Practicum, submitted in partial fulfillment of the requirements of the degree of Master of Science in Internet and E-commerce Technology.

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ABSTRACT

This project is to create & implement a one stop supply chain solution for Philips Semiconductor (Thailand) Co., LTD. This One stop supply chain will reduce transit time to deliver shipment from 7 days to 3 days to USA. The system is developed from the existing transportation mode.

We have improved the system by replacing all transportation carriers to only one carrier. The appointed transportation carrier will perform one loop network on delivery shipment from manufacturers to end customers. The system is more reliable for commitment transit time and, tracking shipment besides reducing inventory carrying costs.
ACKNOWLEDGEMENTS

Several people have made contributions to this project. I would like to acknowledge their efforts and thank them for their encouragement.

I would like to thank Rear Admiral Prasart Sribhadung, Associate Dean of Graduate School of Internet and E-Commerce, my project advisor, for his valuable suggestions, recommendations, information and advice given in the preparation of this project.

My appreciation is due to my colleagues for their help and support. Above all, I am grateful to my parents, whose readiness to invest in my future has enabled me to accomplish my educational goal and objective.
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I. INTRODUCTION

1.1 General Background

Federal Express or FedEx is the largest air express company which provides service to customers around the world in terms of pick up and delivery of packages that are carried by FedEx airplanes. FedEx not just delivers packages, they also provide customized supply chain solutions to different customers depending on customer needs.

Philips Semiconductors is one of the leading semiconductor manufacturers in United States and the world. Philips delivers high-tech components to some of the country’s best known telecommunications, consumer electronic, Automotive and computer companies.

There are network plants in seventeen countries. One of the largest in Asia is located in Vibhavadee Rangsit road, Bangkok Thailand. Each plant has different shipping operations which means they have to manage a complicated network of thirty airlines, six custom brokers and eight freight carriers.

Currently the plant in Thailand delivers semiconductor products to end consumers for two week cycle time. The Supply Chain solution which I would like to propose will reduce cycle time from two weeks to 4 days as total transit time, while using FedEx service as International Priority Direct Distribution which allows international orders to be shipped from the factory directly to customers.

1.2 Objectives of the Project

The objective of the project is to create one stop supply chain solution for Philip Semiconductors of Thailand. The goals of the objective are as following:

(1) To automate and integrate shipping operations.

(2) To shorten transit time from two weeks to less than 4 days.
(3) To meet end consumer demand for faster delivery of products.

(4) To provide supply chain solutions in order to streamline transport.

(5) To replace other carriers which will result in reduced paperwork and invoices.

1.3 Deliverable of the Project

The document of the project including literature review, existing shipping operation path form, propose one stop supply chain model, cost analysis project and recommendation.

1.4 Scope of the Project

The project conduct situation analysis which focus on improvement of transit time on delivery shipment. The scope on this project is developed from existing model. The writer will create and customize on air transportation process for Philips Thailand to their 40 customers in USA. The scope base on information received from fact finding at Philips Semiconductor Thailand. The limitation on this project is use for only Philips Semiconductor Thailand.
II. LITERATURE REVIEW

2.1 Supply Chain Management (SCM)

2.1.1 What is SCM?

A supply chain is a network of facilities and distribution options that performs the functions of procurement of materials, transformation of these materials into intermediate and finished products, and the distribution of these finished products to customers. SCM consist of five main elements which are supplier, manufacturing, warehousing, transportation and customer (see figure 2.1). Supply chains exist in both service and manufacturing organizations, although the complexity of the chain may vary greatly from industry to industry and firm to firm. SCM increased sophistication in customer requirements and greater competition, have pushed the industry towards higher and higher levels of efficiency in an effort to meet customer needs and cut costs. One of the results of this drive has been the outsourcing of goods and services to third parties, in a way that has inexorably bonded the supply chains of operators, contractors and suppliers.

Source: http://www.theprogressgroup.com/

Figure 2.1. Total Supply Chain Management
SCM can manage the flow of information, materials, services and money across any activity, in a way which maximizes the effectiveness of the process. It is about introducing new tools or revising well-known techniques in an effort to ask ourselves: "Is this the right thing to do" rather than "Is this the best way we can continue to do the same thing". This is a continuous process, not a one-time fix. SCM is typically viewed to lie between fully vertically integrated firms, where the entire material flow is owned by a single firm and those where each channel member operates independently. Therefore coordination between the various players in the chain is a key in its effective management.

Traditionally, marketing, distribution, planning, manufacturing, and the purchasing organizations along the supply chain operated independently. These organizations have their own objectives and these are often conflicting. Marketing's objective of high customer service and maximum sales dollars conflict with manufacturing and distribution goals. Many manufacturing operations are designed to maximize throughput and lower costs with little consideration for the impact on inventory levels and distribution capabilities. Purchasing contracts are often negotiated with very little information beyond historical buying patterns. The result of these factors is that there is not a single, integrated plan for the organization. There were as many plans as businesses. Clearly, there is a need for a mechanism through which these different functions can be integrated together. Supply chain management is a strategy through which such an integration can be achieved.

Integrated supply chain management is becoming recognized as a core competitive strategy (see figure 2.2). As organizations continuously seek to provide their products and services to customer faster, cheaper, and better than the competition,
managers have come to realize that cannot do it alone; rather they must work on a cooperative basis with the best organizations in their supply chains in order to succeed.

The supply chain can be viewed as a series of integrated enterprises that must share information and coordinate physical execution to ensure a smooth, integrated flow of goods, services, information, and cash through the pipeline.

Source: Management of Business Logistic

Figure 2.2. Supply Chain Flow.

A variety of changes occurring throughout global markets have resulted in an increasingly competitive environment. As result of these changes, organizations now find that it is no longer enough to manage their organizations. They must also be involved in the management of the network of all upstream firms that provide inputs (direct or indirectly), as well as the network of downstream forms responsible for delivery and after-market service of the product to the end customer. A successful Supply Chain Management will reduce the costs of both clients and suppliers, while sustaining or improving added value and margins. Consequently, companies that have effective supply chains are most successful.

2.1.2 Supply Chain Decision

We classify the decisions for supply chain management into two broad categories strategic and operational. As the term implies, strategic decisions are made typically
over a longer time horizon. These are closely linked to the corporate strategy, and guide supply chain policies from a design perspective. On the other hand, operational decisions are short term, and focus on activities over a day-to-day basis. The effort in these type of decisions is to effectively and efficiently manage the product flow in the "strategically" planned supply chain.

There are four major decision areas in supply chain management:

(a) Location

The geographic placement of production facilities, stocking points, and sourcing points is the natural first step in creating a supply chain. The location of facilities involves a commitment of resources to a long term plan. Once the size, number, and location of these are determined, so are the possible paths by which the product flows through to the final customer. These decisions are of great significance to a firm since they represent the basic strategy for accessing customer markets, and will have a considerable impact on revenue, cost, and level of service. These decisions should be determined by an optimization routine that considers production costs, taxes, duties and duty drawback, tariffs, local content, distribution costs, production limitations, etc.

(b) Production Decision

The strategic decisions include what products to produce, and which plants to produce them in, allocation of suppliers to plants, plants to distribution center's, and distribution center to customer markets. As before, these decisions have a big impact on the revenues, costs and customer service levels of the firm. These decisions assume the existence of the facilities, but determine the exact path through which a product flows to and
from these facilities. Another critical issue is the capacity of the manufacturing facilities and this largely depends on the degree of vertical integration within the firm. Operational decisions focus on detailed production scheduling. These decisions include the construction of the master production schedules, scheduling production on machines, and equipment maintenance. Other considerations include workload balancing, and quality control measures at a production facility.

(c) Inventory Decision

These refer to means by which inventories are managed. Inventories exist at every stage of the supply chain as either raw material, semi-finished or finished goods. They can also be in-process between locations. Their primary purpose is to buffer against any uncertainty that might exist in supply chain. Since holding of inventories can cost anywhere between 20 to 40 percent of their value, their efficient management is critical in supply chain operations. It is strategic in the sense that top management sets goals. However, most researchers have approached the management of inventory from an operational perspective. These include deployment strategies, control policies the determination of the optimal levels of order quantities and reorder points, and setting safety stock levels, at each stocking location. These levels are critical, since they are primary determinants of customer service levels.

(d) Transportation Decision

The mode choice aspect of these decisions is the more strategic ones. These are closely linked to the inventory decisions, since the best choice of mode is often found by trading off the cost of using the particular mode of
transport with the indirect cost of inventory associated with that mode. While air shipments may be fast, reliable, and warrant lesser safety stocks, they are expensive. Meanwhile shipping by sea or rail may be much cheaper, but they necessitate holding relatively large amounts of inventory to buffer against the inherent uncertainty associated with them. Therefore customer service levels and geographic location play vital roles in such decisions. Since transportation is more than 30 percent of the logistics costs, operating efficiently makes good economic sense. Shipment sizes (consolidated bulk shipments versus lot-for-lot), routing and scheduling of equipment are key in effective management of the firm's transport strategy.

2.2 Role of Logistic Service Providers

Many firms engaged in international business also use external logistics service providers to handle most their logistics needs. This shows the need for these companies to establish a close relationship with their service providers. The partnerships reduce uncertainty and complexity in an ever changing global environment and minimize the risk while maintaining flexibility. By using logistic service providers gives the advantages of ownership without the associated burden and allows organizations to take advantage of “best in class”, expertise, achieve customer service improvement, respond to competition, and eliminate assets. A well-designed logistics network provides a streamlined flow between all partners, cutting down the lead-time and cost of moving the raw materials, subassemblies, and finished goods to the destinations.

2.2.1 What is Logistic?

The term logistics has become much more widely recognized by the general public in the last twenty years. Television advertisements, for example laud the importance of logistics. Transportation companies, especially trucking companies,
frequently refer to their organization as logistics companies and paint it on the side of their trailers. Logistics management is the most widely accepted term and encompasses logistics not only in the private business sector but also in the public/government and non-profit sectors. In addition, service companies including banks, hospitals, restaurants, hotels and so on have logistics challenges and issues, and logistics management is an appropriate form for the service industry.

Logistics means getting the right product to the right place in the right quantity at the right time, in the best condition and at an acceptable cost is the challenge of logistics. It's an area that embraces purchasing and supplier management, materials management and manufacturing, inventory management and warehousing, distribution and transport, and customer service. Increasingly, too, logistics is becoming a key consideration in new product development with logistics professionals playing their part in multi-disciplinary teams to ensure products are designed with efficient supply-chain management in mind.

While logistics covers a range of functions, each with its own challenges and skills, they are all interdependent and practitioners must work together and understand the impact on the whole supply-chain to deliver results. To manage, co-ordinate and continuously improve the total supply-chain demands very high-level managerial skills and the capacity to play a key part in meeting a company's longer-term strategic objectives.

Supply-chains feed on data and depend on information sharing, especially in a global environment where speed of communication is of the essence and supply-chains grow ever more complex. Today all areas of logistics make use of information technology to process, tailor and deliver real-time information to when and where it is needed.
2.2.2 Value-Added Role of Logistics

They are four principal types of economic utility add value to a product or service. Included are form, time, place and possession. Generally credit manufacturing activities with providing form utility, logistics activities with time and place utility, and marketing activities with possession utility. The following are the most commonly referred to in terms of economic utilities:

(a) Form Utility

Refers to the value added to goods through a manufacturing, production, or assembly process. For example, form utility results when raw materials are combined in some predetermined manner to make a finished product.

(b) Place Utility

Logistics provides place utility by moving goods from production surplus points to points where demand exists. Logistics extends the physical boundaries of the market area, thus adding economic value to the goods. This addition to the economic value of goods or service is known as place utility. Logistics creates place utility primarily through transportation.

(c) Time Utility

Not only goods and services are available where consumers need them, but they must also be at that point when customers demand them. This is called time utility, or the economic value added to a good or service by having it at a demand point at a specific time. Logistics creates time utility through proper inventory management and the strategic location of goods and services. To some extent, transportation may create time utility by moving something more quickly to a point of demand. Time utility is much
more important today because of the emphasis upon reducing lead time and minimizing inventory levels through logistics-related strategies such as Just in Time (JIT) inventory control.

(d) Possession Utility

It is primarily created through the basic marketing activities related to the promotion of products or services. Promotion may define as effort, through direct and indirect contact with the customer, to increase the desire to possess a good or to benefit from a service. The role of logistics in the economy depends upon the existence of possession utility, for time or place utility make sense only if demand for the product or service exists. It is also true that marketing depends upon logistics, since possession utility cannot be acted upon unless time and place utility are provided. Order fulfillment is the critical and often final step for meeting customer requirement.

2.2.3 Logistics as a source of competitive advantage for the Supply Chain

Logistics is defined by Council of Logistics Management (CLM) as "the process of planning, implementing and controlling the efficient, effective flow and storage of goods, services and related information form the point of origin to the point of consumption for the purpose of conforming to customer requirements. Logistical management is vital not only to manufacturing and assembly industries, which are good-oriented but also to retailing, transport, and other distribution or service-oriented industries.

2.2.4 SCM and Logistics

The integrated SCM will only increase the importance of logistics activities. SCM provides the supply chain members with opportunity to optimize logistical performance at the inter-organizational level. Logistics professionals will continue to be challenged
to manage the movement of products across the supply chain in a timely and cost-effective manner that meets customers’ required service level.

2.3 Transportation Management

Transportation costs, which represent approximately 40 to 50 percent of total logistics costs and 4 to 10 percent of the product selling price for many companies, may represent logistics management’s major concern. Transportation decisions directly affect the total logistics costs, costs in other functional areas of the firms, and costs within other logistics channel members. Transportation management strategy contains 6 factors:

(a) Proactive Management Approach.

With the regulatory safety net gone, today’s transportation manager must rely on traditional management techniques, using a proactive approach to identify and solve transportation problems and to provide the company with a competitive advantage in the marketplace. A proactive management approach seeks to identify transportation problems and to postulate solutions that benefit the whole company. Without a regulatory rule book, transportation management is free to concentrate on innovative solutions to today’s logistics and transpiration challenges.

(b) Reducing the Number of Carriers.

By reducing the number of carriers it uses, a shipping firm increases the freight volume and freight revenue that it gives to carrier, thereby increasing its ability to have the carrier provide that rates and services the shipper needs. As the shipper concentrates its freight business in a limited number of carriers, the shipper becomes more important to each carrier; and each carrier, in becoming more dependent on the shipper’s business, is more
willing to negotiate with the shipper. Reducing the number of carriers a form uses may also increase the possibility of providing a carrier with balanced loads of raw materials inbound and finished goods outbound. By reducing excess capacity, a balanced-load pattern enables the carrier to reduce its costs and to offer lower rates. In addition, providing the carrier with balanced loads may increase the carrier’s service level.

(c) Negotiating with Carriers.

The transportation manager must possess negotiating skills sufficient to secure the desired service level at the least cost. Successful carrier negotiation has enabled many companies either to remain competitive in the market or to increase competitive advantage through improved carrier service levels. Throughout this negotiation, the market power that each party enjoys influences the outcome. The shipper possesses market power in terms of the transportation business available in a given time period and an increase this market power by limiting the number of carrier it uses. The carrier possesses market power by limiting the number of carriers it uses. The carrier possesses market in terms of the carrier’s importance to the shipper.

(d) Contracting with Carriers.

Contracting enables the shipper to eliminate the uncertainties in rates and services that common carriers provide. Through the contract terms, the shipper can specify the rate and level of service that the carrier will provide and can dictate noncompliance penalties, thereby fixing service levels during the contract period. Companies implementing the just-in-time (JIT) system use contracting to ensure safe, consistent, and fast service. The JIT
system emphasizes low inventory levels and reliance upon transportation to deliver goods as customers and logistics nodes need them. Transportation delays decrease production, increase inventory costs, and disrupt operations, which defeats JIT’s objectives.

(e) Consolidating Shipments.

The freight volume a shipper tenders to a carrier directly relates to the freight rate the carrier charges. By consolidating shipments, the transportation manager can reap the benefits of the lower rates carriers charge for larger shipment volumes. As a general rule, carriers charge lower rates for shipping larger quantities. Carrier cost per weight unit transported decreases as the shipment weight increases. A shipper may utilize freight consolidation to support a competitive price marketing strategy. By consolidating shipments, the transportation manager realizes a lower carrier rate; and shipper can translate this lower transportation cost per unit into a lower price for buyer purchasing the larger quantity.

(f) Monitoring Service Quality.

Transportation service quality can differentiate a company’s product, thereby providing the company with a competitive market advantage. An ability to get the product to the customer on a consistent, timely, and undamaged basis reduces the buyer’s inventory and stock out costs. Thus, product differentiation through the transportation service a company provides is a significant non-price marketing strategy. A fundamental element for implementing service quality monitoring is information. The transportation manager must have information regarding the customer service demands and the service level that current carrier provide. Without
this information, the transportation manager cannot make a rational transportation service/cost decision that meets the shipper’s established logistics and corporate goals.

Knowledge of the transportation system is fundamental to efficient and economical operation of company’s logistics function. Transportation is the physical thread connecting the company’s geographically dispersed operation. More specifically, transportation adds value to the company by creating time and place utility; the value added is the physical movement of goods to the place desired and at the time desired. As supply chains become increasingly longer in the global economy, transportation function is connecting buyers and seller that may be tens of thousands of miles apart. This increased spatial gap result in greater transportation costs. In addition, operations within this international marketplace require more transportation time, which necessitates higher inventories and resulting in higher storage costs. Therefore, the greater the buyer-seller gap, the greater the transportation and storage costs.

2.3.1 Transportation Management Solution and Logistics Systems

Effective transportation management solution and logistics systems form the backbone of ensuring timely delivery at minimal cost, a critical success factor for organizations today. Information system brings its technology and domain expertise across the area of transportation and logistics, in enabling organizations ensure customer value delivery.

Transportation management strategies are approaches that reduce and manage the demand for transportation projects. They also improve the operational characteristics of the transportation system. These strategies are designed to modify travel behavior and increase system efficiency without costly infrastructure improvements. A variety of
transportation strategies are needed to meet the challenges we face today and will face in the future. Some of the major issues are as follows:

1. Insufficient funds to meet system improvement needs
2. Increased construction costs for new roadway and transit facilities
3. Increased need to improve operational efficiency
4. Changes in travel patterns
5. Lower densities making traditional transit an inefficient option in many areas
6. Need to reduce transportation related air pollution

Transportation management strategies consist of three interrelated components: demand management; system management; and technology applications.

1. Transportation demand management consists of strategies that manage the demand for transportation facilities by increasing transit share, decreasing trip making and lowering the overall growth in vehicle miles of travel, particularly singly occupant vehicle trips.

2. Transportation systems management consists of lower-cost capital projects and operational and institutional actions that improve the operating efficiency of facilities and services, enhance the quality of service and promote transit use.

3. Intelligent transportation systems consist of the deployment and use of technologies to improve, manage and share information; provide for the integration of transportation services; provide for improved incident response systems; and provide other system management and operational improvements that enhance efficiency and safety.
2.4 Inventory Management

Inventory is the key element of all supply chains. Through effective inventory management, inefficiencies can be driven out of the supply chain and overall costs reduced. Managing inventory levels across the supply chain is complex and affects all the other elements of the supply chain. A high level of inventory is not only capital intensive but also expensive to service through increased spend on capital, warehousing, transport, and procurement. Typical benefits that can be achieved through the inventory management methodology are:

- Reduction in inventory levels by as much as 50%
- Improvement in availability and service levels by up to 15%

1. Inventory & Service Levels. There is a direct correlation between service levels and the level of inventory held. Many companies hold high levels of inventory to ensure that service levels remain high. The higher the level of inventory the less chance of a “stock out” and therefore a service failure. This tradeoff is called the inventory service balance.

2. Inventory & Competitive Advantage. Through matching supply with demand, a supply chain becomes far more streamlined and responsive. Not only does this drive down costs through reduced inventory and overhead, it drives up customer service through better availability and speed of response.

2.4.1 Inventory Management across the Supply Chain

The major trend facing organizations today is the demand for ever-greater levels of responsiveness and shorter defined cycle times for deliveries of high-quality goods and services. The customers are demanding quicker delivery responsiveness. In some industries, product life cycles are shrinking from years to a matter of 2 or 3 months. The customers are willing to pay a premium if they can get their goods and services very
quickly. Customers will award their business to time-based competitors because it means that they too can reduce their inventory levels while saving time and money.

There is a secondary effect for companies that achieve time-based capabilities: Reductions in delivery lead time translate into not only less inventory but also less rework, higher product quality, and less overhead throughout every element of the supply chain.

There are both internal and external benefits associated with being a time-based competitor. The external effects refer to benefits enjoyed by time-based organizations in the marketplace relative to their competitors (such as higher quality, quicker customer response, technologically advanced products). The internal benefits are found within and between the different functional areas in the firm (including simplified organizations, shorter planning loops, increased responsiveness, better communication, coordination and cooperation between functions).

2.4.2 Inventory Costs

Inventory cost is the cost of holding goods, usually expressed as a percentage of inventory value; include the cost of capital, warehousing, taxes, insurance, depreciation and obsolescence. Inventory costs are important for three major reasons. First, inventory costs represent a significant component of total logistics costs in many companies. Second, the inventory levels that a firm maintains at points in its logistics system will affect the level of service the firm can provide to its customers. Third, cost trade-off decisions in logistics frequently depend upon and ultimately affect inventory carrying costs. Inventory as a percent of overall business activity continues to decline. Explanatory factors include: greater expertise in managing inventory, innovations in information and communications technology, greater competitiveness in markets for
transportation services, and emphasis upon reducing cost through the elimination of non-value-added activities.

2.5 Customer Satisfaction

Customer satisfaction doesn't always lead to customer loyalty. These days, even if the customers are completely satisfied with the product or service, 40% of them will leave and start doing business with our competition.

On the surface, 40% may not seem like that much. After all, over half of our satisfied customers are coming back. But in dollars and cents, 40% is costing us more than we may think, because attracting new customers can cost nearly double the amount it takes to attract repeat business from your existing customer base.

The solution is quite simply, in order to retain all the customers and increase our sales, we need to go beyond customer satisfaction and develop the rapport that will make the customers adore. Then you will achieve true customer loyalty.

These are the steps we take to stay focused on outstanding customer satisfaction, but in a world that wants everything yesterday, it's quite a challenge to stay ahead of the customer satisfaction curve. We have several suggestions that can help to tune in to the customers and increase their satisfaction with the product, service and company.

Guideline number one: Listen to and capture the voice of the customer. Know what delights and pains him/her. This is not a static voice, so the conversation must be ongoing.

Number two: Think ahead of the customer. Anticipate his wants and needs before he even realizes them. Did you even know you needed a remote keyless door lock for your car? We didn't until we got one and now we can't leave home without it.

Next, realize that staffs cannot build a wall around the customer. Never assume that because the company is embedded in their systems, which they will stay with you
forever. Because there are so many sources of information and service, customers can walk away quickly. As we discussed earlier, appeal to the customers on both an intellectual and emotional level. We want the customer to say, "Choosing that company makes good sense and makes me feel good."

Five, use technology to enhance the customer experience, not to avoid an experience with the customer. For instance, if your automated phone system is designed to handle customers' simple requests, that's efficient and probably economical. But if your customer needs some information or action that's not even offered as an option, then he'll abandon the transaction in irritation. Technology in this example is hurting your business and customer, not helping.

Finally, cherish your good reputation and do everything you can to keep it strong. If you do, you'll reap several dividends. For one thing, the halo effect of an excellent reputation paves your way into new markets in the next state or on the other side of the world. Roll up your shirtsleeves on the job of customer satisfaction, you can never roll them back down, or turn off the lights, or leave the building. You must be willing to change your business model, your business strategy or even your view of the universe to make sure you're satisfying your customer.
III. EXISTING SYSTEM

3.1 Philips Semiconductor Background

Philips Semiconductor, with revenues of US $4.6 billion in 2003 is a world leader in silicon systems and standard products for wireless communications, digital entertainment, computing and automotive applications. The organization design, develop and manufacturing silicon solution based on its innovative Nexperia architecture to create living technology for its customers who build products, service providers who use them, and consumers who enjoy the resulting products and services.

Things move fast in the semiconductor industry and Philips Semiconductors is no exception. One of the leading semiconductor manufacturers in the United States and the world, Philips delivers high-tech components to some of the country’s best-known telecommunications, consumer electronics, automotive, and computer companies. As Philips’ customers demanded faster service, the company realized its supply chain was not equipped to handle the shortened cycle time efficiently. Philips needed a better solution.

Philips Semiconductors has been building semiconductors longer than any other company and is considered a market leader. But like other semiconductor manufacturers, it still faces increased customer demands for faster time-to market. To stay competitive, companies are being forced to reinvent themselves so that the supply chain encompassing sourcing and procurement, production scheduling, order fulfillment, inventory management, and customer care is no longer a cost-based, back-office exercise, but rather a flexible operation designed to effectively address today’s challenges.
3.1.1 Different sources, different systems.

Customer demands for faster delivery strained Philips’ complex network of plants in seventeen countries. Each source plant had a different shipping operation, which resulted in Philips having to manage a complicated network of thirty airlines, six customs brokers, and eight freight carriers. In all, the fragmented supply chain meant a two-week total transit time. And at any given moment, the information about product in transit was spotty at best. As customers began demanding products faster than the company could deliver, Philips began stocking buffer supplies of products in remote depots, adding inventory. Philips knew the situation was costly and had to be resolved. Each day, an average of $2 to $4 million in pipeline inventory was inaccessible. Customers experienced slow response and late shipments.

3.2 Philips Semiconductor’s current Supply Chain System

The semiconductor industry has one of the longest and most complex manufacturing processes in the entire business world. Yet semiconductor customers are increasing pressure on the manufacturers to decrease production time, while keeping costs low.

Philips’s customers wanted to react very quickly in a very short time, and yet they have a long supply chain. What they needed was a solution that would allow them to make fast and accurate responses to changes in demand. The following figure shows the current process of shipping from manufacturer to the end customers. In the present, the following processes take time about 2 weeks.
From figure 3.1

1. Manufacturing produce product and pack on bulk shipments.
2. Truck provider load on bulk container and move to airport.
3. Shipping Agent performs export clearance formality paperwork.
4. Forwarder reserve space on commercial airline. Using space on commercial flight on uncertain quarantine space. The space availability depends on the cargo space on aircraft which varies on volume of day by day basis. Therefore on commercial airline can not confirm their space on day by day operation.
5. Import Custom broker at destination receive and clear each shipments through customs process. The clearance process has to expedite clearance.
for each shipment. For example: If they send 1,000 shipments, the imports agent have to clear each shipment’s commercial invoices.

(6) Shipment is loaded on import truck’s provider and stock on importer warehouse.

(7) Order is pulling out from stock and re-labels shipments to customer.

(8) Shipments are loaded on truck and deliver to end customer.

In addition to a limited transportation network, Philip was challenged by supply chain issues such as IT system capabilities and order-to-delivery times. The existing distribution network ultimately led to unnecessary inventory carrying and transportation costs.

For the existing model we have to prepare 40 documents daily. There are 2 kinds of paper work.

(1) Air way bill: the paper work that contain shipper address and receiver address. This is the legal document which has to be signed by shipper. (Figure A.1)

(2) Commercial Invoice: the Commercial Invoice is important for the clearance process used by customs officials to classify merchandise so that duties & taxes can be correctly assessed. The sample of Consolidation Commercial Invoice shown in Figure B.1 is a suggested format, but your commercial invoice should include the following information. (Figure A.2, A.3)

(a) Shipper/Exporter: Contact name, company name, full address and VAT number, if applicable.

(b) Country of Manufacture: The country in which each of the commodities in your shipment was originally manufactured or produced.
(c) Importer: If the shipment will be handled by an importer who is not the recipient, add a full name and address here.

(d) Add the FedEx International Air Waybill number, our main reference for your shipment.

(e) Your description of each commodity must include:

1. Full description
2. Harmonized code (where possible)
3. Reason for export/intended use
4. Any part or serial numbers
5. Country of manufacture

Before you sign the Declaration: Ensure that all the information is consistent with the Air Waybill or your shipment could be delayed in customs. Certain commodities may need extra documentation or export licenses. We need one original commercial invoice with five copies, all individually signed. We also recommend that you put a copy inside one package.

3.3 SWOT Analysis

(1) Strengths

(a) Proprietary products: Philips Semiconductor Thailand produce and test package design of integrated circuits electronic component.

(b) Market leader: The National Electronics and Computer Technology Centre (Nectec) says there are currently five major IC-packaging makers in Thailand -- Dutch-based Philips Semiconductor, and US firms AMD, Microchip, Lucent and National Semiconductor. These form the core of the 18 IC-packaging producers here.
(c) Economies of scale: One of largest exporters for semiconductor product in Thailand. The value of export is about 10 million baht per day exported to USA.

(2) Weaknesses

(a) The transit time for delivery of the shipment is long, about a week to USA.

(3) Opportunities

(a) Increased market growth: Company will be able to increase market in USA by shortening delivery cycle time - Increasing bargain power with suppliers and carriers.

(b) Replace and consolidate supplier and carrier into one organization.

(4) Threats

(a) Competitors (foreign, domestic)

(b) Low barriers of entry

(c) Technology factors

(d) New business models

(e) Substitute products

(f) Buyers gaining power
IV. THE PROPOSED MODEL FOR ONE STOP SUPPLY CHAIN SOLUTION

4.1 The Proposed Model Solution

4.1.1 Order Management Process

Order Management Process description are as following:

**Process 1:** Customers place their orders at the point of origin, which are received at the Philips North American headquarters and routed to one of Philip’s seventeen international manufacturing plants. The Labels will be print out and apply at the point of origin. Shipments, packages will be scan and information will be uploading into the information network. Then packages will be sending to the destination by our airplane.
Process 2: Electronic Customs Clearance begins in flight. Using One Stop Supply Chain System, multiple orders are electronically consolidated and cleared through customs as a single bulk shipment.

Process 3: Orders arrive at the hub where the single bulk shipment is deconsolidated to the individual shipment level and dispatched for direct delivery to customers.

4.2 Features of Service

4.2.1 Overview

One Stop Supply Chain is a contract-negotiated service that allows a shipper to send a multiple piece shipment from a single origin location to multiple consignees in one destination country using one International Master Air Waybill. After customs clearance, the shipment is broken down into individual packages and delivered to the final recipients within the same destination country. The shipments move and clear destination customs as a single shipment. The entire shipment is consigned to and entry is made in the name of only one importer or record. The shipment must also come from an exporter of record. Individual pieces within the shipment are delivered to the recipient indicated on Shipping or Express Manifest label.

4.3 Customer Benefits

A supply chain solution that allows customers to reduce order cycle time by drop shipping from manufacturing location in one country directly to their end-users in another country.

The most important result of this program is to increase customer satisfaction. They will be able to support sales growth and customer demands for safety stock without adding inventory, and the end-customers will have much more confidence in
the ability to meet delivery commitments consistently. The following are the benefits that the customers will receive when using our service:

(1) General Benefits

(a) Reduced cycle time from manufacturers to customers and reduce inventory levels. With our automation and integration, customer response time will be down from more than two weeks to less than five days. Doubled the number of inventory turns and cut inventory levels by 50%.

(b) A unique concept in Door-to-Door Service. Our One Stop Supply Chain System allows international orders to be shipped from manufacturer direct to the end customers.

(c) The warehouse can fulfill all domestic orders overnight. Products can bypass warehouses altogether and ship directly from the source in one country to the customer in another. For example, many products shipped from the Philips location in Bangkok are packed and labeled by US customer order, then bulk-shipped as part of a single international air express freight movement. This bulk shipment is separated upon clearance of customs and delivered directly to the customers.

(d) The internal benefits are equally powerful. Millions of dollars in pipeline inventory will be converted as usable products, and outsourcing warehouse operations to agent is generating additional labor savings.

(e) Replacing dozens of carriers with one is resulting in a radical reduction in paperwork and invoices.
3 Business Days Commitment.

The Money-Back Guarantee for delivery delays is applicable and is calculated on a pro-rated basis. The charge, when requested, will be credited only for those pieces that did not make delivery commitment — not the entire shipment. The information Money-Back Guarantee does not apply.

Real-time Tracking

Customs Cleared

Improved Production Planning

Access To The Global Marketplace

Helps Philips World Class Customer Service

Minimize Loss, Damage And Delay

Improved flexibility in expedited service and rush deliveries

Total Cost Reduction Benefits

Eliminate warehouse cost

Reduce insurance Costs

Avoid out-of-stocks

Lower overhead

Inventory turns increase

Increase sales and cash flow

4.3.1. Why choose our One Stop Supply Chain System over the competition?

Few other carriers are as experienced at providing a door-to-door, full service, time-definite, consolidated distribution system comparable to our proposed model "One Stop Supply Chain System".
(a) Speed - One Stop Supply Chain System allows customers to fine-tune their global distribution mechanism, with fewer shipments sent strategically through one port of entry. From the start, we help them arrange their shipments for consolidated transportation and efficient, pre-arrival customs clearance. Once inside the destination country, we manage the deconsolidation and redistribution of your goods to multiple locations. This timesaving service is delivered in most cases, in two to four business days.

(b) Flexibility - Whether the customer need to implement on a multi-plant, multi-country basis or simply in one origin destination, our network of global transportation resources allows us to scale the service to meet their current distribution needs. In addition we offer flexible billing options with split billing, unlimited commodities per airway bill as we serve a number of industries.

(c) Precision - Leveraging world-class information technology infrastructure, our One Stop Supply Chain System provides in-depth visibility from departure through port of entry and on to the destination location. Every step of the way, we supply the customer with status details that helps them plan and manage inventory with in-depth precision.
4.4 How System Works

Process Description for Figure 4.2. One Stop Model for Preparation.

1. Philips Semiconductor send export product information to agent.
2. Agent open master airway bill.
3. Agent put carton on weighing scale. Agent scans sequence# on carton to provide tracking number.
4. Print shipping label on carton.
5. Put away carton.
6. Last carton (Yes/No)?
7. Perform close to print master AWB & reports; Upload data.
8. Send file to Philips server to print consolidate commercial invoice.(seqno, invoice#, awb#) for transmission. (Figure B.1.)
(9) Agent email consolidated commercial invoice to USA for pre-customs clearance.

4.5 Cost Analysis

Existing Model

<table>
<thead>
<tr>
<th>Service Description</th>
<th>Cost</th>
<th>Unit</th>
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<tbody>
<tr>
<td>Truck to airport 40 shipments</td>
<td>1,000</td>
<td>Baht</td>
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<tr>
<td>Export Processing fee for 40 shipment daily</td>
<td>40,000</td>
<td>Baht</td>
</tr>
<tr>
<td>Air Freight from Airport to Airport</td>
<td>70,000</td>
<td>Baht</td>
</tr>
<tr>
<td>Import Clearance at USA</td>
<td>200</td>
<td>USD</td>
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<tr>
<td>Truck to warehouse USA</td>
<td>500</td>
<td>USD</td>
</tr>
<tr>
<td>Warehouse in &amp; out USA</td>
<td>200</td>
<td>USD</td>
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<tr>
<td>Truck to end customers</td>
<td>4,000</td>
<td>USD</td>
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</tbody>
</table>

Total cost of Existing Model: 307,000 Baht/Day

Propose One Stop Model

<table>
<thead>
<tr>
<th>Service Description</th>
<th>Cost</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Export Processing fee for 40 shipments daily</td>
<td>40,000</td>
<td>Baht</td>
</tr>
<tr>
<td>Air freight Door to Door</td>
<td>230,000</td>
<td>Baht</td>
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<tr>
<td>Distribution label fee</td>
<td>16,000</td>
<td>Baht</td>
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</tbody>
</table>

Total cost of Propose One Stop Model: 286,000 Baht/Day

One Stop Model installment fee for one time investment: 5,000,000 Baht

The sample for One Stop installment fee include:

Fix cost as computer server, weight equipment, new truck routing fee, and system integration One Stop software and miscellaneous for management fee.
One stop model will save compare with existing model.

Total Cost of Existing Model – Total Cost of Propose One Stop Model = Saving per day

307,000 - 286,000 = 21,000 baht per day /1000 kg

**Break Even Analysis**

Break even Volume = \( \frac{\text{Fix cost for investment}}{\text{Saving}} \)

= \( \frac{5,000,000}{21,000} \)

= 238 tones

**Table 4.1 Total Amount Each Quarter**

<table>
<thead>
<tr>
<th>Quarter 1</th>
<th>Quarter 2</th>
<th>Quarter 3</th>
<th>Quarter 4</th>
<th>Quarter 5</th>
<th>Quarter 6</th>
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<tbody>
<tr>
<td>1,386,000</td>
<td>2,772,000</td>
<td>4,158,000</td>
<td>5,544,000</td>
<td>6,930,000</td>
<td>8,316,000</td>
</tr>
</tbody>
</table>

**SHIPMENT /QUARTER = 66 TON (22 WORKING DAY* 3 MONTHS*1 TON)**

![Graph showing break even point](image)

Figure 4.3. Break Even Point.

34
Q1 = 66 * 21000 = 1386000
Q2 = 66 * 2 * 21000 = 2772000
Q3 = 66 * 3 * 21000 = 4158000
Q4 = 66 * 4 * 21000 = 5544000
Q5 = 66 * 5 * 21000 = 6930000
Q6 = 66 * 6 * 21000 = 8316000

The One Stop Supply Chain model will break even the investment in 238 days of shipping (tones per day). After dated of 239, Philips Semiconductor will start saving 21,000 baht per day from implementing the One Stop Model.
5.1 Conclusions

Philips Semiconductor of Thailand current Supply Chain System is taking long time process of delivery to the end customer. Philips has to send shipment to USA. The volume on daily basis is about 40 shipments weight 1000 kg. That shipment will be sent to 40 customer addresses in USA, the company has to deal direct to thirty airlines, six customs brokers, and eight freight carriers. In all, the fragmented supply chain means one week total transit time.

The proposed of One stop supply chain model is a contract-negotiated service that allows a shipper to send a multiple piece shipment from a single origin location to multiple consignees in one destination country using one International Master Air Waybill. After customs clearance, the shipment is broken down into individual packages and delivered to the final recipients within the same destination country. The shipments move and clear destination customs as a single shipment. The entire shipment is consigned to and entry is made in the name of only one importer or record. The shipment must also come from an exporter of record. Individual pieces within the shipment are delivered to the recipient indicated on Shipping or Express Manifest label.

This One Stop Supply Chain model creates new supply chain path form. The delivery cycle time reduces from one week to 3 days. The customer will receive packages earlier than in the current system. The cost of shipping is reduced to 21,000 baht per day compared to existing model. However Philips Semiconductors has to invest on 5 million baht for one time in order to change to a One Stop Model. The breakeven point is on the 238 day. At date of 239 Philips Semiconductor will start saving at about 21,000 baht from changing to One Stop Supply Chain Model.
The most important result of this One Stop Supply Chain model is to increase customer satisfaction and those satisfactions will come from the service we provide to customer. We can reduce cycle time process from manufacturers to the end customers which the current system took time about 2 weeks but this model take only 3 business days, reduce inventory level, provide Door to Door service, provide real time tracking, reduce dozens of carriers to one carrier, etc.

5.2 Recommendations

The recommendation will relate customer using experience. This model will create customer satisfaction by receiving shipment faster than in the current system. After the implementation of this model. We will create full report to track all shipments and provide proof of delivery in order to trace whether end users receive shipments within the 3 days commitment.
APPENDIX A

EXISTING MODEL PAPER WORK
Figure A.1. Sample of Air Waybill.
Figure A.2. Sample of Commercial Invoice.
Figure A.3. Sample of Commercial Invoice.
CONSOLIDATION COMMERCIAL INVOICE

SHIPPER:
PH. SEMICONDUCTORS (THAILAND) CO., LTD
(INDUSTRY DISTRIBUTION RV)
PH. SEMICONDUCTORS
CHAENGWATTANA ROAD
LAKSI PLAZA
BANGKOK 10210

DATE OF EXPORTATION: yyyy-mm-dd
AIR WAYBILL NO: XXXXXXXXXXX
HAWS: 636721922997
FLIGHT: FX5880

IMPORTAER EIN Number: xx-xxxxxxx-xx
PHILIP SEMICONDUCTORS
811 E ARQUES P.O. BOX 3409
SVL CA 94088 -3409
U.S.A.
Attn: xxxxx
COUNTRY OF ULIMATE DESTINATION EXPORT REFERENCE US

PRODUCTS

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<tr>
<th>NO.</th>
<th>HAWS</th>
<th>AIRWAY BILL</th>
<th>INVOICE NO.</th>
<th>TARIFF CODE</th>
<th>ARTICLE/TYPE</th>
<th>COM</th>
<th>US DESCRIPTION</th>
<th>PRODUCT REFERENCE</th>
<th>WT (KGS)</th>
<th>QTY</th>
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<th>TOTAL AMT (USD)</th>
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**GRAND TOTAL:**

xxxx xxxxxx $xxxxx

I DECLARE ALL INFORMATION CONTAINED IN THIS INVOICE TO BE TRUE AND CORRECT

EXPORT DEPARTMENT:

SIGNATURE OF SHIPPER / EXPORTER (NAME AND TITLE)  

(DATE SIGNED)
**The Calculation of Break-Even Point**

Calculation of break-even point is that quantity \( Q^* \) for which

\[
Q^* = \frac{FC}{P - UVC}
\]

Where \( Q^* \) = break-even volume

- \( FC \) = fixed costs
- \( P \) = unit price
- \( UVC \) = unit variable cost
- \( (P - UVC) \) = contribution margin
BIBLIOGRAPHY

English References


Website References


3. http://www.nectec.or.th/


