CHANGING TO ELECTRONIC BILL OF LADING BY A FREIGHT FORWARDER IN BANGKOK

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Abstract

A Bill of Lading is an important document, for international trade and marine insurance, and has been for hundred of years. It provides the basis of financial security for the exporter, and allows goods to be traded while in transit, many times before they reach their destination. Merchants are increasingly using information technology in trade transactions, and are changing to EDI forms, Electronic Bills of Lading will reduce time and cost, thus improving competitiveness.

The root causes of the Company's need to improve were found by using a fishbone diagram, produced by team leaders. Times and costs were compared between traditional and electronic Bills. The result is that the electronic method is shortened, an improvement of 71% in process time, cost is reduced over 5 years. With a return on investment of 35.24%, the breakeven point between cost and volume can easily be reached, errors are reduced, and some staff can be redeployed.

บทคัดย่อ

เอกสารใบตราส่งสินค้า เป็นเอกสารสำคัญสำหรับการค้าระหว่างประเทศและการประภัยทางทะเล ซึ่งเอกสารดังกล่าวมีการใช้กันมานานหลายร้อยปี เป็นเอกสารพื้นฐานของความปลอดภัยทางการเงินสำหรับผู้ส่งออกว่า ผู้รับขนส่งจะส่งสินค้าไปยังเมืองท่าปลายทาง ผู้ค้าเริ่มมีการใช้เทคโนโลยีสารสนเทศในการทำธุรกรรมการค้าและกำลังจะเปลี่ยนไปในรูปแบบใบตราส่งอิเล็กทรอนิกส์ เพื่อลดเวลาค่าใช้จ่ายและเพื่อปรับปรุงศักยภาพในการแข่งขัน

ผู้นำทีมจะใช้แผนภาพก้างปลาในการพัฒนาและปรับปรุงการบริหารภายในบริษัท อีกทั้งยังมีการเปรียบเทียบเวลาในการปฏิบัติงานและต้นทุนระหว่างการออกใบตราส่งแบบเดิมและแบบอิเล็กทรอนิกส์ และจากผลที่ได้รับแสดงให้เห็นว่าการออกใบตราส่งแบบอิเล็กทรอนิกส์ได้ผลที่ดีกว่าแบบเดิม อีกทั้งบริษัทยังสามารถพัฒนาขั้นตอนการปฏิบัติการได้ถึง 71 เปอร์เซ็นต์ และต้นทุนลดลงกว่า 5 ปี โดยมีผลตอบแทนจากการลงทุน 35.24 เปอร์เซ็นต์ ทำให้บริษัทสามารถคืนทุนได้อย่างรวดเร็ว ข้อผิดพลาดในการปฏิบัติงานก็ลดลง อีกทั้งยังสามารถโยกย้ายพนักงานไปในตำแหน่งที่เหมาะสม

*This article is based on Ms. Lertkitcha's research project report which was part of her MSc program in Supply Chain Management in 2009.

Introduction

The freight forwarding business is highly competitive. Thailand has about 400 such companies. A Freight Forwarder is a company which provides a full range of logistics services, specializing in shipping cargo by sea or air. It prepares all necessary documents, provides trucking services, warehousing, freight negotiation, and arranges cargo insurance for customers and helps to file any consequent insurance claims. Freight forwarders are usually able to issue their own bills of lading (called house bill of lading). A Bill of lading is a very important document which is signed by a transporter of goods (the carrier) and issued to the shipper of goods (the exporter), being evidence as a receipt of goods for shipment to a specified person. The company will provide documents (shipping particulars) to an exporter for reserving vessel space for the cargo once all consignments are confirmed. The company then requests the carrier (ship) to issue an ocean bill of lading to the company. The company also issues a document to the exporter called a house bill of lading

The freight forwarder in this study, AAA Company (a pseudonym) provides a full range of services, including air and sea, and has a worldwide network in 250 countries including USA, UK, Singapore, Hong Kong, Taiwan, China, and Japan. For sea freight, the company provides services for FCL (full container load) cargoes.

The AAA Company's major problem was that it experienced delays in delivery, even though it tries to provide fast customer service. It found that staff responsible for issuing documents to customers had operating time problems due to too many internal processes involving several departments. This meant that the bill of lading was delivered late to the customer. For short distances, such as a shipment from Bangkok to Hong Kong, the transit time was five days, and the original bill of lading must be delivered to the shipper/exporter before the vessel's departure or the day of departure. If the shipment arrives at its destination while the original bill of lading is still on the way, the consignee cannot release the cargo and must wait for a messenger to deliver the original bill of lading. In addition, while the cargo has to remain at the port, demurrage (delay) charges are incurred which have to be paid by the consignee.

The entire documentation process takes around 170 minutes. The greater the time taken, the greater the risk of delaying delivery of the document. Some customers' offices are in outlying provinces. A customer might want to revise some details in the original bill of lading, while the delivery staff is on the way to the customer, meaning that the delivery staff must return to their office for a revised bill of lading and then make another delivery to the customer. This has a knock-on effect on delivery staff, and the company has to hire outsourced messengers.

The primary objective of the study was company service improvement by using electronic bills of lading, by studying how to implement and electronic bill of lading (E-B/L) project; understand the people involved; and measure the possible success in terms of financial value and time. Historical data over five years was used. The company began to use electronic bill of lading at the beginning of 2009.

Containerisation of Sea Cargo

With globalization of trade and reductions in tariff barriers, many more firms are exporting or importing goods by sea. Non-bagged goods travel in bulk carriers, and bulk liquids in tankers. However, 75% of dry goods are packaged and then placed in 'containers'. These metal boxes come in a variety of sizes and shapes but the commonest is a standard 40-foot container. If a consignor has enough goods to fill a container, that is FCL (full container load) and can securely travel from the firm's warehouse and not be opened until it reaches the consignee's destination warehouse (known as door-to-door or 'house-to-'house). If a firm's goods are insufficient for a full container, they are classed as LCL (less than full) and join other goods either at an Inland Clearance Depot or a container yard near the quay, being similarly treated at the destination. LCL cargoes are subject to more risks than FCL, because of the diverse unknown nature of neighbouring goods, and the greater security risk. A journey can be multimodal; it can include road or river transport before and after the ship's voyage.

Containers travel in specially designed containerships, which get bigger by the year, and are the biggest shops afloat except oil tankers. Some can carry 6,000 standard 40' containers. These ships go at great speeds, with a fast turnaround at specially designed container ports, and regularly have a 40 degree roll in heavy seas. The containers are locked in position by metal cell-guides, but obviously have to take the stress of a ship heaving and rolling. Appropriate packing is therefore essential.

The newest containerships have more tiers (stacks) of containers above deck than below, which are therefore subject to greater rolling stress and exposure to rain, wind and waves. Some containers are blown off into the sea or buckled by strong winds or waves. The longer the voyage and the greater the number of ports of call on the way, the greater the risk of loss or damage, through handling, stowage, theft, weather, and changing climatic conditions (which can induce 'ship's sweat', condensation inside the container and on the ship's sides). As these huge ships have no decks, all containers, even those inside the hull, are exposed to weather. The bottom containers are on raised supports, with pumps used to keep the hold bottom dry. High pressure water fire-fighting systems are installed.

Container ships have to use specifically designed ports, which have quay facilities for temporary storage, repairs-shops for damaged containers, cranes, gantries and other loading/unloading devices, and links to transport infrastructure (such as trucks and trains). Laem Chabang is Thailand's major container port, large and efficient, with the appropriate facilities and infrastructure links. It was opened in 1990.

Marine Insurance

Most trade is conducted on credit, firms borrowing from Banks as there is a lag between buying materials and producing goods before any customer payments. Banks usually need to see proof of cargo insurance, or risk their client going bankrupt or otherwise becoming a bad risk through accidents to the cargo.

Most early sea voyages hugged the coast. Marine insurance was the very first type of insurance, for ships and cargoes. Before that, a ship/cargo owner would borrow the money needed. If the ship sank, the lender took that responsibility. If the voyage was successful, the borrower paid a very high rate of interest. Pope Gregory IX stopped that in 1236 by declaring usury to be illegal as it was condemned in the Bible (usury means excessive interest). Subsequently, the first surviving marine contract was in Pisa, Italy, in 1343. The first mention of an insurance company is in Genoa, Italy, in 1643, followed by Paris, France in 1668. International trade, across deep oceans, expanded dramatically as a result of the discovery of America, the 'New World' by Columbus in 1492, which created an increasing demand for marine insurance. In 1720 two insurance companies in England were given the monopoly for marine insurance, for 100 years. But groups of individual underwriters (who were not breaking the monopoly) were gathering in Lloyds coffee house in London. Lloyds was incorporated in 1871, and more companies had been established after the ending of the monopoly in 1820 to cater for the increased demand for all types of insurance, caused by the Industrial Revolution.

The first British law to recognize marine insurance was in 1601, and contained that classic phrase: 'upon the loss or perishing of any ship there followeth not the undoing of any man, but the loss lighteth rather easily upon many than heavily upon few'.

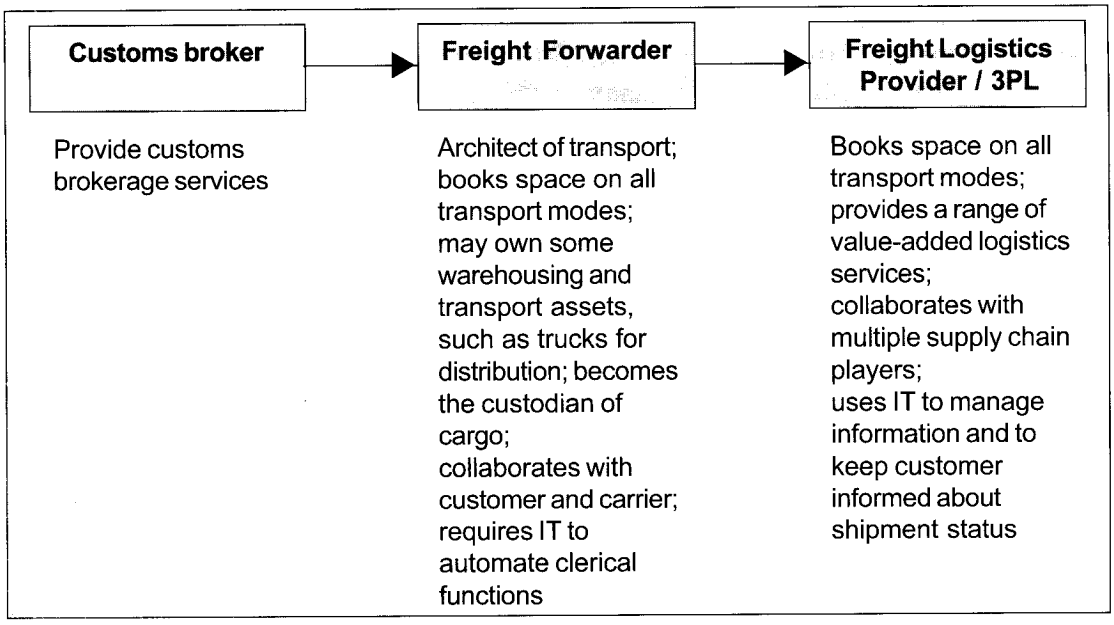
Cargo insurance policies can be assigned to follow changes in title or interest. That is necessary, to make a policy relevant to the nature of modern commercial transactions. A cargo at sea can be sold to another, especially bulk cargoes. A cargo claim must normally be supported by a Bill of Lading in addition to other documents.

Development of Freight Forwarding

During the 13th century in the time of the Venetian Republic, merchants called on brokers to arrange the carriage of goods. The origin of modern freight forwarding was in the 18th century. Freight Forwarders are a logical consequence of world trade development and need for organization of the distribution of goods. The increasing expansion of freight forwarding began in the second half of the 19th century with the development of various new means of transportation. A rebirth began after the Second World War, when specialized companies became necessary to cope with the difficulties of abiding by different international conventions, national legislation, and with new transportation modes such as containerships.

Mostly, a freight forwarder acts as a common carrier, able to use its own name to issue a bill of lading and take responsibility for the whole carriage (Wang, 2005). One freight forwarder can accept a consignment from another freight forwarder as customers, not only directly from a consignor. They have evolved considerably in the past decade, as in the Figure below.

Figure 1: Freight Forwarders' Evolution



Source: Adapted from Baluch, 2003

As Baluch, 2003 stated, traditionally the role of the freight forwarder was to act as a transportation company on behalf of exporting companies. Then they provided an additional logistics service to compete with their competitors. The key role for most freight forwarders is export transportation process, documentation advice, and storage. Many forwarders now have their own distribution center and warehouses which provide the service to exporters.

The big freight forwarders are now full logistics service providers being involved in the comprehensive supply chain management of the customer's product. Freight forwarders have responsibilities to choose the mode and means of delivery, storage and carriage of goods. They also provide legal activities, financing, port administration, customs clearance, and insurance functions. They provide customers with the necessary documents to clear the goods e.g., shipping particular, packing list, invoice, certificate of origin, and advice about procedures of authentication and legalization of these documents. An important document, for several reasons, is a Bill of Lading.

Bill of Lading

Sending goods on a risky long voyage to a foreign country involves a high degree of trust and a time lag whilst the goods are on their journey. Therefore complicated essential financing and documentation have evolved. There is some evidence of the origin of bills of lading in the Greek-Roman period, when a merchant used a notebook for recording details of goods loaded onto a vessel (McLaughlin, 1925). In 1063, Italy passed the law of "Maritime Ordinance of Trani", in which a vessel clerk must record details of goods loaded onto the vessel. In the 14th century, the custom of the sea regulated that vessel clerks must have a registered book, and a

merchant should notify the clerks about his goods, otherwise, the vessel owner would not be responsible for damage to the goods. The bill of lading was inevitable because it was inconvenient for a merchant to travel with his goods. So, the method began of duplicating the document from the register book with the signature of the vessel owner and the specified conditions of transportation.

In modern times the following documents are essential. A Shipper prepares goods for shipment, by packaging, labeling, and arranging for transit, or coordinates the transportation of goods. An Ocean Bill of Lading (OBL) is a document issued on behalf of the carrier describing the kind and quantity of goods being shipped, the shipper, the consignee, the ports of loading and discharge and the carrying vessel. A House Bill of Lading (HBL) is issued by a freight forwarder to a shipper as a receipt for the goods being shipped with other cargo as one consignment. It is similar to an Ocean Bill of Lading. A Letter of Credit (L/C) is a written commitment to pay, by a buyer's or importer's bank (called the issuing bank) to the seller's or exporter's bank (called the accepting bank, negotiating bank, or paying bank). A L/C guarantees payment of a specified sum in a specified currency, provided the seller meets precisely-defined conditions and submits the prescribed documents within a fixed timeframe.

In effect, the Bank is financing goods in transit. This system protects the exporter and importer from the risk of non-completion and foreign exchange risk, and provides the financing mechanism without which much international trade would cease. A Letter of Credit is a promise to pay – if specified documents are produced when payment is requested. One important specified document is a Bill of Lading. This is issued to an exporter by a carrier (e.g. shipping line). It is an essential document if there is a cargo insurance claim.

A bill of lading has three functions. First, it is the certified document that the goods have been received by the ship (shipment bill of lading) or by the carrier (shipped bill of lading) (Schmitthoff, 2000) Second, it is evidence of a contract of carriage. The bill of lading mentions the condition of the goods, and also the weight, shipping marks, number of packages, on board date, and the date of issuing bill of lading. Finally, it is a transferable document of title, allowing ownership of the cargo to be transferred by endorsing the bill of lading. The carrier's obligation to deliver is tied to the possession and presentation of this bill of lading. The transfer of a bill of lading serves as a transfer of the possession of the goods. Traditionally, bills of lading are issued in sets of three or more originals. To release the cargo, the ship owner must be requested to present the first original bill of lading to clear the cargo (Schmitthoff, 2000). Original bills of lading do not need to be present when both parties have negotiated or there is no problem in payment between each other. However, a bill of lading is necessary when there are a lot of re-sales shipments, when payment is by documentary credit, or when the seller needs the security of a document of title. If the bill of lading does not reach the consignee before the goods arrive at the destination, the consignee may be able to use a letter of indemnity as a temporary substitute for the original bill of lading.

Computer and IT application has attempted to incorporate the three functions of the bill of lading (receipt of goods, contract of carriage, and document of title) into telecommunicated

messages. Zekos (1999) states that a negotiable document of title is valuable collateral, as it allows quick, easy and inexpensive possession and release of the cargo. Seaway bills are used to substitute for traditional bill of lading (Todd, 1986). A seaway bill is a non-negotiable document that shows evidence of the contract of carriage and of the receipt of goods by the carrier. It is not a document of title and it cannot be used to transfer ownership of the goods. A consignee does not need to be presented with the bill of lading for taking delivery of the goods; the carrier delivering to the consignee needs only prove his identity. Seaway bills have advantages over the traditional bill of lading since they avoid complex documentary processes and reduce the risk for the consignee. However, they have also disadvantages because sea-way bills are not negotiable and are not accepted by banks for documentary credit. Also, they do not have the security which a traditional bill of lading provides. A buyer (original consignee) who has paid for the goods before shipment departure may face the risk that the seller may change to another consignee while the goods are in transit.

The advantages and disadvantages of bill of lading

National Reports in Greece, described by Pampouki (2000), discuss the advantages of the traditional bill of lading, that it is a commercial paper that makes the easy transfer of rights of goods, especially by endorsement, and delivery. But it has some disadvantages. Transfer of the bill of lading and the right to release the cargo may take some time. The arrival of shipping documents may be delayed which means that the goods arrive at the destination port before arrival of the shipping documents. Also the arrival of documents at the port of discharge is usually delayed by a Bank along the way for the purpose of documentary credit. Todd (1990) states that the primary problem of using a traditional bill of lading is that it can create additional costs of delay at the port of discharge regarding the custody and insurance of the goods. High cost is also another disadvantage of the paper bill of lading due to process of issuing and processing of documents. Yiannopoulis (1991) argues that the total transportation cost to the company may be higher by 10% to 15% because of delay in issuance. The replacement of bills of lading with seaway bills is not always possible because some traders and banks prefer to use the original bill of lading that has more security. Legal problems also arise because the laws remain limited to paper bills of lading.

Figure 2: Benefits and concerns of using electronics bill of lading

Item	% of respondents
Tick the three most important benefit of using eBoLs	
They offer	
Speedier documentation processes	78
Better management information	51
Saving on postage	47
Improved accuracy	28
Business integration opportunities	26
Easier access to change data	18
Reduced dumurrange costs	16

Item	% of respondents
Reduced risks	12
Data storage savings	8
Improved asset utilisation	2
Tick your three most important can cerns about using eBOLs	
Security of data	92
Legal integrity	78
Technical support	41
Speed of access	24
Government policy	22
Costs of training	8
Difficult to use	8
Costs of equipment	4
If you chose to use eBOLs instead of traditional BOLs which service would you choose?	
EDI	53
Establish my own web site	20
A third-party network provider	16
A business partner's web site	10

Source: Adapted from Mei & Dinwoodie, 2005

The Table above indicates works conducted in Shanghai, China's premier port and logistics hub, headquarters for half of China's shipping lines, logistics companies and branches of most international shipping lines. The three most important benefits of using electronic bill of lading is that it is speedier, offers better information management, and saves on postage. The respondents prefer an EDI system because of its reliability, confidence and trustworthiness.

Banks use EDI systems. Formerly, most letters of credit communications between banks and beneficiaries were by paper, between banks themselves. But now the letter of credit message is communicated by teletransmission. To communicate through EDI, the data has to be uniform and standardized, and, data received does not have to be retyped. Electronic procedure replaces the paper work in international trade. Electronic transfer of money is the most efficient way for goods and services payment in international trade. The EDI system for banking called "SWIFT" (Society of Worldwide Interbank Financial Telecommunications) is used in international commerce by the banking industry for the communication of commercial letters of credit between banks worldwide. It was established to simplify the transmission of bank to bank financial transaction messages (Kozolchyk, 1992). The success of SWIFT in letters of credit, proves the feasibility of transferring ownership of large sums of money electronically.

Electronic communication can transfer ownership during transit. When the company receives the original paper bill of lading from the shipper they will issue a pass code to the shipper. When the shipper has negotiated the bill of lading, it will notify the company by computer and give the buyer a portion of the pass code. The buyer will also be notified by the company. After receiving and testing both messages the company records in the registry the name of the

buyer as the new owner. The company also records this information on the original paper bill of lading in its possession. When the goods arrive at the destination, the company will transmit a code to the carrier and to the last owner of the record. The code allows the owner to claim delivery of the goods. Also, the text of a sea waybill may be electronically transmitted to the port of destination and the consignee may receive the goods from the carrier without presentation of the original bill of lading. (Merges and Reynolds, 1986). The bill of lading data is transmitted electronically but for information purpose only.

Digital Signatures

The idea of creating digital signatures was first proposed in 1976 by Whitfield Duffie, at Stanford University. A digital signature transforms the message that is signed from one person to another person. The digital signature uses a secret key (private key) to send messages and a public key to verify them. The message translated by the private key can only be verified by the public key. The sender is the only person who has to create the signature and also has to use a private key to create the signature. The application of digital signature is called the "one-way hash" which allows people to know one digital (who send the message) and it also blocks copying the signature to another message. Therefore, it is guaranteed that the signature is original. Also legally, a written signature can show the signer's identity. Hence, handwriting signature and written documents enhance securing the documents and information. Digital signatures are created and verified by cryptography. Digital signatures are used as a public key cryptography by using two different related keys, one for creating a digital signature and another key for verifying a digital signature. The risk of digital signature is that some sender may know the public key and use it to verify the sender's signature. However, Digital signatures are accepted in several countries, and international standards are developed in co-operations that are accepted by many, like banks and governing agencies.

Trust in electronic commerce is an important factor because it involves visible processes for identification, secure technology, and reliablity. Wilson (1997) confirms that the security of paper work generates more confidence than electronic documents.

Legal and Technological Challenges to Electronic Bills

The United Nations Commission on International Trade Law (UNCITRAL) has identified the laws for the requirement of the documents that have to be written and signed. Traditional writing cannot be changed without leaving a trail. In contrast, most electronic data can generally be changed or erased (Whitaker, 1991). Computerized records that are made in the ordinary course of business can satisfy the statute of frauds writing requirement because of the intent of the party to record the transaction and this can confirm that a contract exists (Williams, 1991). A question for electronic transaction is who will bear the liability for error messages, failures in communication, and system breakdowns. Liability must be in a fair and predictable manner and the parties are liable for direct damage caused by failure to follow the rules, except when the failure is an unexpected situation beyond a party's control.

There are many barriers to paperless trading that exist because of the divergent documentary practices of carriers, bankers, and shippers. In an electronic environment, the challenge is to preserve the marketability of electronic records that replicate paper data, in particular by securing their authentic, unique, and confidential electronic system (Frisch and Gabriel,1995). In international business, companies do not have confidence in the electronic bill of lading because of concerns about security and authority of documents. Legally, the transfer of ownership from seller to the buyer must be done by delivery of goods. However, the use of an electronic bill of lading is a business rather than a legal decision. The law that applies to electronic bill of lading may provide the function in the same way and must have same effect as the traditional bill of lading. However, the use of electronics bill of lading is more concerned with accuracy, privacy of information, for security of transactions and acquisition. It is concerned with technology rather than legal solutions.

In Thailand, the Electronic Transactions Act of 2001 covers digital signatures. However, there is no specific law covering all aspects of carriage of goods by sea, which in some cases differs from international accepted rules or customs. The parties cannot ascertain their rights and liabilities especially on the effects of the bill of transfer in regard to the transfer of ownership or contractual rights and liabilities and the protection of transferee. This practice creates uncertainties and confusion. On some occasions the result is against the parties' will. The Carriage of Goods by Sea Act, 1991, has been under consideration for revision and could clarify the law on carriers' rights and liabilities. However the draft changes do not cover all aspects of the effects of the transfer of bills of lading. There is still need for future interpretation. Nonetheless, this draft will provide a firm basis for the Thai legal system on sea carriage and will be one big step in the process of legal evolution. There is the Multimodal Transport Act of 2005, but that mainly extends the law relating to sea transportation to supplementary non-ship transport such as trucks and train.

Methodology

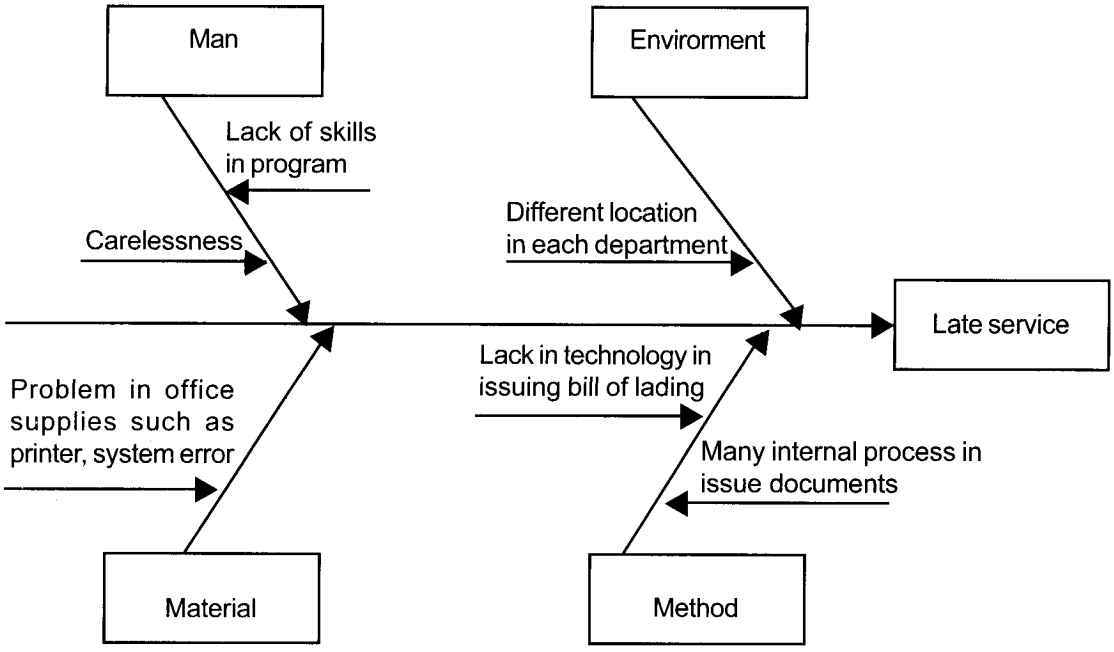
This project used SWOT analysis to determine the company's strengths, and the weaknesses to be overcome. A fishbone diagram produced by an expert team within the Company reveals the problem. (Figure 3)

This revealed that there were too many internal steps and people involved in issuing bill of lading, which take too much time. If a customer wants to change the details in bill of lading, the process will be halted and revised.

Information was obtained from current customers to study their expectations in using electronic bill of lading. A survey questionnaire was sent to 27 companies who were large users of containers, and others were sent to concerned persons who have responsibility for export shipments. Also, the company's internal records were examined.

In changing to an electronic application, the company had to consider the cost of investing in a new system, such as IT staff, internet expenses, and website development. Excel spreadsheet

Figure 3: Analyzing the problem with a Fishbone Diagram



Source: Author

was used for this and to compare costs. In changing to an electronic application the company is able to eliminate delivery expense, postal expense and also reduce telephone and fax expense, and these details were calculated.

Advantages and Disadvantages of Using Electronic Bill of Lading

Using electronic bill of lading, there are benefits for many parties such as the company, customers and banks. The benefits for the company are:

- Saving in cost of delivery. These costs will be eliminated because the documents can be printed at the customer's office, so a messenger is not necessary.
- Enhanced quality of service. As all processes are digitally electronic, the customer inputs the necessary detail and sends it to company via EDI. The company's staff are able transfer the data into the Bill format without retyping, and error is thus eliminated.

The benefits to customers are:

- Convenience in receiving the bill of lading. Customers do not have to wait for the company to deliver the Bill of lading as they can print it at their own office immediately after company confirmation. They can also save the time in sending it to their final destination customer.
- Easy tracking. Customers are able to trace their past record. They can trace the Bill number and the date that it was printed. They can check the departure date, and destination port through the company's website.

- Faster Bank application for money. The AAA Co., Ltd. has affiliated with a particular Bank which support customers who have its letters of credit. The Bank can quickly approve the details sent after the Bill is issued.

Benefits to the Bank are:

- The Bank can provide this service to other freight forwarders or exporters. It would a benefit to attract new customers.

However, there are also disadvantages:

- As customers have to log in to the company's website for printing the bill of lading, there could sometimes be a problem with the server.
- Each company uses different printer models and the format of the details of one company may be different from another. The company has to set up a format for each printer model.

Results: Saving Time and Cost, Improving Efficiency

With the electronic bill of lading, the staff can save up to 120 minutes (from 170 down to 50) processing time, and 1 staff (from 3 down to 2). With the traditional Bill, the staff can issue only 3 sets of bill of lading in a day, or 90 sets in a month. With the electronic process, 10 sets can be issued in a day or 300 sets in a month. Using Excel spreadsheet, the data shows that the electronic system can save the Company nearly 5 million Baht over 5 years. The return on investment to make this happen is 35%. A break-even analysis which considers the interaction of cost and volume of transactions reveals that with the Company's increasing trade it can easily reach the breakeven point. The number of staff involved can also be reduced, producing savings of over half a million Baht a year. Furthermore, errors in issuing bill of lading are reduced because operation and customer service staff do not have to retype details in the bill of lading form. This research projects therefore reveals the successful adaptation to an EDI system for Bills of Lading, and the importance of that to many parties involved in the carriage and insurance of cargoes by sea.

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