



A SELECTION FRAMEWORK OF EDI IN RETAIL BUSINESS ORGANIZATION IN THAILAND

by

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Submitted in Partial Fulfillment of
the Requirements for the Degree of
Master of Science
in Information Technology
Assumption University

May, 2000

The Faculty of Science and Technology Thesis Approval

Thesis Title A Selection Framework of EDI in Retail Business Organization
 in Thailand.
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Academic Year 2/1999

The department of IT, the Faculty of Science and Technology of Assumption University had approved this final report of the **twelve** credit course, **IT 7000 Master Thesis**, submitted in partial fulfillment of the requirements for the degree of Master of Science in Computer Science.

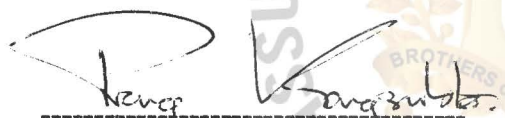
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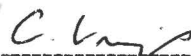
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ACKNOWLEDGEMENTS

The author wishes to express her most sincere gratitude to her advisor Dr. Wisanu Tuntawiroon for his helpful guidance and style throughout the research period.

Thanks go to the THAI TRADE NET 's company supplying the source of information for this work. Thanks are also due to A. Kitipan for reading and checking the format of this thesis.



ABSTRACT

Recent advances in information technologies have made significant changes in many areas like education, research, industries and business. In the area of business, these technologies have made globalization of the business operations a reality. In order to be in cutting edge of the globalization process, organizations have to decide which information technologies are the most appropriate for them at present.

This research will attempt to identify and evaluate the most successful information technologies associated with Electronic Data Interchange (EDI) and propose basic guidelines on how to apply them for business.

My thesis intends to develop a Decision Base - Electronic Data Interchange (DB-EDI) model to aid in evaluating the appropriate criteria relative to EDI in retail business organizations in Thailand. The criteria used in this model will be formulated for selection of EDI communication types. Use of the DB-EDI model provides frameworks for assisting with plans to use EDI in selecting communication types, which are appropriate to their needs. The DB-EDI model developed will include information obtained from EDI service providers. The DB-EDI model test will be contrasted from existing user test to assess their accepted result of test and recommend on critical factors affecting the selection EDI types.

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CHAPTER 1

INTRODUCTION

1.1 BACKGROUND OF THE THESIS

Approaching the information management, many organizations are looking towards electronic commerce as a tool for making them competitive in the world of business. Electronic commerce is a modern business methodology that employs the computer and information technology to address the needs of organizations, merchants, and consumers to reduce costs while improving the quality of goods and services and increasing the speed and the service of delivery. It develops not only the new society, which means new markets. The role of electronic commerce in business is increasing everyday. It seems to be a treasure box, which gives every one a chance to be wealthy. Many companies prospered with it, some started their businesses with it, some applied it to their business later but still gained more profit from utilizing it, while other companies dissolved because they ignored electronic commerce. Therefore organizations now realize that they cannot avoid using electronic commerce for their business. But, not all companies who decide to use this business weapon will be successful with it. It is hard to use this business tool properly because choosing the right technologies out of those, which are available, is a major problem for any organization.

Increasing cost and competition in global trade have led to a search for efficient, cost-effective techniques for trading particularly through the application of the computer and communication technologies. The increasing use of Electronic Data Interchange (EDI) in the conduct of international trade and transport by the developed countries in the past years, is a testimony to this fact. Through EDI, not only can business transactions be streamlined and speeded up, but marketplaces can

be expanded by the use of network systems with an enhanced relationship between companies.

A lot of companies turn to EDI for increases in efficiency and productivity, which allows companies to meet customers' demands more accurately, and confidently than before. The major improvement results from the automatic transfer of information from computer to computer, which reduces time for re-key information and reduces costly errors. Thus, companies have applied a number of EDI-based solutions to improve business transactions. EDI has spread in all major industries. A sample of EDI applications currently includes international trade, financial EDI, electronic funds transfer (EFT), insurance, and manufacturing/retailing procurement.

1.2 Statement of Problem

Adopting electronic commerce in organizations is not easy. Without looking at the reluctance to adopt technology in organizations, the major problem is how to choose the appropriate technology of electronic commerce for any companies within a limited time frame. Time for making a decision is limited because technologies grow and change constenuously. Any wrong decision can cause a series of damages to an organization.

Among those technologies, which are available in electronic commerce, the technology, which has successfully applied in business is EDI (Electronic Data Interchange). Many organizations do not have a sufficient understanding of EDI. Although, they know that EDI is useful for business, they do not know how to choose and how to utilize it efficiently because their project managers who have responsibilities for implementing information system projects may not have enough

knowledge about technologies and may not know how to apply EDI to their organizations.

Organizations have to spend large amounts of time and money in the initial stage of utilizing EDI. Every organization needs help in order to move from the initial stage of electronic data interchange implementation to the steady stage as soon as possible for the best effective investment. The initial cost cannot be avoided but it can be reduced if an effective and reliable framework of utilizing EDI is adopted by organization. If a consultant is hired, it will increase cost and time. A consultant has to spend a lot of time in studying the customer's organization while using in-house system analysts can reduce cost but not time. However, this study of selection framework of EDI types will help organization reduce both cost and time in the initial stage.

The Decision-Base Electronic data Interchange (DB-EDI) model was a decision-making framework of EDI communication types for retail business in small-medium-large size.

This DB-EDI model can reduce both cost and time in the initial stage for a firm that plans to use EDI. This DB-EDI model has many benefits for retail business in Thailand.

1.3 OBJECTIVE

1. To develop critical factors for selection framework EDI in retail business to choose EDI communication types.
2. To establish an appropriate framework in evaluating EDI communication types.

3. To study the effect of the use of DB-EDI model; that is how it can promote the use of EDI communication types in retail business and how it can also applied for retail business.

1.4 SCOPE OF THESIS

The DB-EDI model is designed the selection framework for decision making to selection EDI types in retail business. This DB-EDI model has 3 EDI communication types and critical factor for selection EDI types

EDI communication types are:

- Point-to-point Link
- EDI via Internet
- Commercial VAN

The following critical factors in the selection of EDI communication types should be considered.

- 1) Security issue
 - Data security
- 2) Technical issue
 - Ease of implementation and Maintenance
 - Expertise Level Needed
 - Advance operation system
- 3) Economical issue
 - Costs
- 4) Support issue
 - Service areas
 - Number of trading partners

The DB-EDI model can help business to successfully implement EDI. This research proposes the appropriate criteria and frameworks, which will assist potential business selecting appropriate EDI types.

The above factors are important in the selection of EDI communication types in order to propose the appropriate selection framework EDI types to help retail business in Thailand.

The data analysis was an important issue on the DB-EDI model. From the analysis, it was found that the users of EDI communication types all have their own reasons in selecting the types they are using.

Based on the analysis, criteria and framework in evaluating and selecting EDI communication network types were formulated into DB-EDI model.

1. The method for building the DB-EDI Model

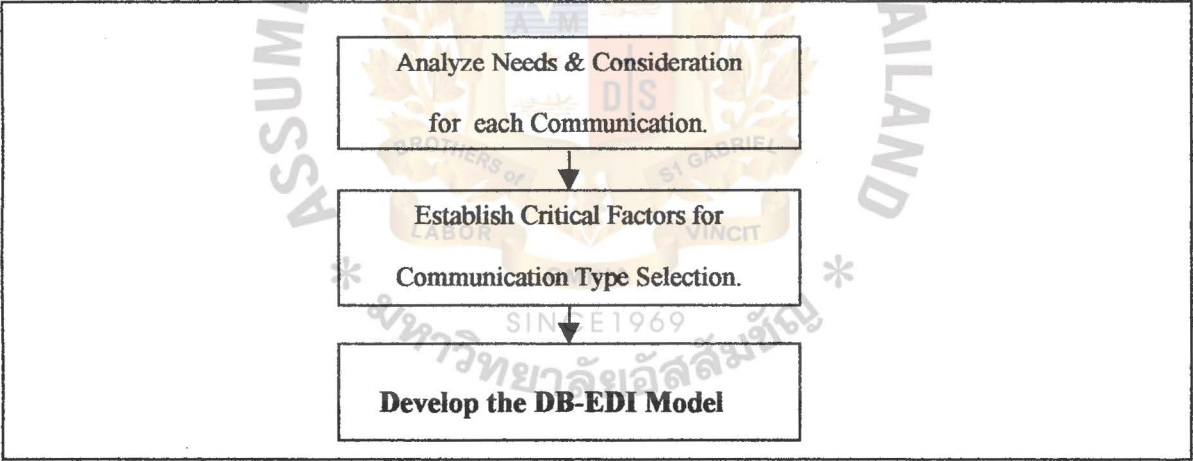


Figure 1-1: The method for building the DB-EDI Model

2. After user tested DB-EDI Model, we have found that the users accepted it (from their response to our questionnaires by interview) because it can promote the use of EDI in retail business and can be also applied for retail business.
3. Recommendation from users who test DB-EDI Model.

CHAPTER 2

LITERATURE REVIEW

The literature contains several models evaluating framework of Electronic Data Interchange. Jose Romeo L.[1993] proposed framework, which attempts to evaluate in analyzing the significant impacts of information technology on a firm and provides important considerations to top management and suggests key policy issues to government in adopting, implementing and operating EDI technology.

Varaluck C.[1995] proposed existing literature are based on case studies from many developed countries. They gave varying aspects for EDI system implementation. This research attempts the emergence of EDI in retail business in Thailand. The case study on MAKRO's order purchasing systems has shown the benefits of EDI against the present system being used which include the reduction of lead time, administrative attention, paper usage and potential errors. On a wider scale, the use results to reduction in inventory, improve customer service and cash management, and increase the competitiveness.

Sumet S.[1997] proposed a framework, which attempts to evaluate two of the most successful information technologies for globalization: Electronic Data Interchange (EDI) and Internet and proposes basic guidelines on how to apply them for business. This framework also provides information related to usage, cost, obstacles and trend of both technologies in Thailand. The results of framework were useful to business organizations in developing countries.

Lai Jung-Sheng[1998] proposed framework, which attempts to evaluate in business EDI aspect, financial EDI will "close the loop" It is the final step in improving and managing the entire business transaction cycles. The objectives of this

research are to understand the process of financial EDI in Taiwan, and survey the inhibition factors that affect banking industry in developing the financial EDI.

2.1 Electronic Data Interchange (EDI)

The rise in worldwide competition has spurred business to develop better ways of managing the flow of raw materials, stocks and finished goods along the supply chain. Companies have used paper as the traditional medium for conducting business. Company records are filed on paper, and paper forms are mailed between companies to exchange information. The advent of the business computer has enabled companies to process data electronically; however, the exchange of this data between companies still relies heavily on the postal system. Oftentimes, a company will enter data into a business application, print a form containing the data, and mail this form to a trading partner. The trading partner, after receiving the form, rekeys the data into another business application. This process results in poor response times since the use of the postal system can add days to the exchange process, excessive paperwork for both companies involved in the exchange, and the potential for errors as information is transcribed. Through the use of Electronic Data Interchange, or EDI, companies are able to monitor their operations better as well as communicate speedily with their trading partners. In addition, the increase in efficiency and productivity allows companies to respond to customers demands more accurately and confidently than before.

2.2 Definition of EDI

EDI is defined in a remarkably similar manner by the vast majority of writers on the subject, as the following sample of the many available definition indicates:

- "The standards-based computer-to-computer exchange of inter-company business documents and information"[4].

- "Computer-to-computer exchange of standard business data"[7].
- "The computer-to-computer exchange of standard business documents between trading partners. This includes the company's suppliers, its customers and its banks"[16].
- "The movement of business data electronically between or within firms, in a structured computer process data format, that permits data to be transferred without re-keying from a computer supported business application in one location to a computer supported business application in another location"[8].
- "The replacement of the paper documents used in Administration, Commerce and transport by electronic message conveyed from one computer to another without the need for human intervention"[17].
- "The transmission of business data in a structured, electronic format from a computer application in one business to a computer application in another"[6].
- "Combinations of the computing and telecommunication power replacing the paper document as the data-carrier for trade-related activities and services. EDI is paperless trading. It is the shortest path between the computer systems of customers and suppliers"[23].

EDI is defined as interprocess communication (computer application to computer application) of business information in a standardized electronic form[13].

EDI is a structured document interchange which enables data in the form of document content to be exchanged between software applications that are working together to process a business transaction. EDI only specifies a format for business information.

The actual transmission of the information is handled by other underlying transport mechanisms such its electronic mail or point-to-point connections.

Because of the different approaches in developing and implementing EDI, there are many definitions of EDI. One practical definition is:

"EDI is defined as the transfer of structured data by agreed message standards from computer to computer by electronic means."[20]

To understand better, the definition is broken down into the following parts:

- structured data
- message standards
- electronic means

2.2.1 Structured Data

EDI requires that the computer system can easily generate and process messages, so the data format is designed for computers, which as usual, implies that it is not very readable for humans. Therefore, EDI is not the same as either printer documents or electronic mail.

2.2.2 Message Standards

EDI is concerned with exchanging messages in an open environment. In order to operate in an open environment no one company can impose its own data standards on other companies. Internal data standards are fine for use within an organization, but may not work outside the organization. For inter-company message exchange there needs to be a universally agreed standard structure to the messages. Universal doesn't mean the whole world has to agree, it means any company participating in a particular EDI community must agree. Therefore, standards are required.

2.2.3 Electronic Means

The meaning is to send data by using telecommunications.

EDI is designed to facilitate the exchange of business data by electronic means without human intervention or with minimal human intervention among, for example, manufacturers, wholesalers, distributors, retailers, shippers, consignees, carriers, banks and government agencies. By the widespread use of computer telecommunication, companies could transmit data electronically into a trading partner's business application. These electronic interchanges improve response time, reduce paperwork, and eliminate the potential for transcription errors.

2.3 Benefits of EDI

The primary benefit of EDI is a considerable reduction in transaction costs, by improving the speed and efficiency of filling business documents. Although this costs saving is still important it is now apparent that the driving force behind EDI is its ability to provide significantly better levels of customer service and consequently a competitive edge over rival companies. Furthermore it is frequently predicted that in the not-too-distant future companies will look to EDI to provide totally new business opportunities, and indeed this is beginning to happen within some industries.[11]

summarized causes of benefits of EDI. All benefits result from:

2.3.1 EDI reduces or eliminates

- paperwork
- manual data entry postal delay
- rekeying of information
- errors

- administrative expense

2.3.2 EDI allows

- faster and more accurate information flow
- closer links with suppliers
- just-in-time inventory system
- use of modem communication networks
- enhanced customer service

2.2.3 EDI facilitates

- productivity
- profitability
- competitive edge.

EDI's direct impacts include labor-savings in the areas of data transcription, controls, and error investigation and correction; and fewer delays in data-handling. The lists of the resultant benefits that are to be found in the business literature are remarkably similar, although more recent writers have begun to refer to EDI benefits in terms of their strategic/tactical potential [2]. For instance, provides the following list.

Strategic EDI benefits include the ability to:

- Enable implementation of cost-reduction programs(e.g. JIT and QR).
- Provide support for maintenance or improvement of market share.
- Improve certain business services significantly.
- Enable business units to expand the user of computer application.

Tactical EDI benefits include:

- Faster and more efficient information exchange with trading partners.

- Improve quality reduction of errors, omissions and lost or misplaced documents.
- Increased productivity.
- Reduced out-of-pocket expenses (labor, printing, postage, faxing, filing)

2.4 EDI Components

To electronically transmit EDI document between trading partners, three main technical components are required.

2.4.1 EDI Hardware

EDI works from nearly any computer (PC, Mac, UNIX, Mainframe) because EDI is hardware-independent. Modem and communication equipment with standard protocols built in make this hardware-independence possible and are thus necessary.

2.4.2 EDI Translator

The software component that governs the conversion of application data to and EDI interchanges is called an EDI translator. Most EDI translators provide two services: data mapping and standards formatting.

Standards formatting is the primary role of an EDI translator. For outbound transactions an application writes the transaction data to a file (called a flat-file). The translator formats the data according to the appropriate EDI syntax rules and produces an EDI file which is ready to be communicated to a trading partner. For inbound transactions the translator verifies that the standard version and release are supported, and that the syntax of the

interchange is in compliance with the standards, The translator produces a flat-file for the application as output.

To convert flat-file data to and from EDI data, a translator must understand the format of the flat-file data. This understanding is achieved in one of two ways. First, the translator might require the user to generate the flat-file according to a format defined by the translator. This means that the user must modify the application data so it can be processed by the translator. Second, the translator might provide a tool that allows the user to specify the format of the flat-file. This tool is called a data mapper. Data mapping reduces or eliminates the programming required to integrate the translator with a business application.

Data mapping is beneficial if an application uses files for input and output. If, however, an application reads and writes data to a database rather than to files, the user needs to develop software that generates the flat-file from information stored in the database, and vice-versa. Responding to this requirement, some commercial translators now offer the capability of exchanging data directly with an application database. This removes the need for any interface software between the application and the translator.

2.4.3 Communications

The EDI translation process converts application data to and from communications-ready EDI data. The communications service, however, is not part of the translation process. The EDI standards do not specify how EDI data is to be transmitted to a trading partner. Types of communication options will be discussed later in this chapter.

2.5 EDI Process

The following section describes a typical EDI document exchange between two trading partners[10].

2.5.1 Preparation of Electronic Documents

The first step in any sequence of EDI is the collection and organization of data by internal application (e.g., accounting, purchasing). When the sender sends a document (e.g., purchase order, invoice), rather than printing out the document, the system builds an electronic file of document.

2.5.2 Outbound Translation

The next step is to translate this electronic file into a standard format mutually agreed on by the processing systems. The resulting data file will contain a series of structured transactions related to the document

2.5.3 Communication

The EDI structured transactions are transmitted over a communication network to appropriate receiver.

2.5.4 Inbound Translation

The receiver retrieves the files and reverses the process, translating the file from the standard format into the proprietary format required by the receiver's application software.

2.5.5 Processing Electronic Documents

The receiver can manipulate the information received in the internal application systems. The process will be similar in a wide variety of all relationships, whether for goods or services. The only difference would be the type of transactions used.

relationships, whether for goods or services. The only difference would be the type of transactions used.

2.6 EDI Document Standards

To be sent to various trading partners who could be using a variety of software applications at their end, EDI information must be translated to EDI standards that lay out the acceptable fields of business forms. There are two prevailing EDI translation standards that define the content and structure of EDI forms. The Accredited Standards Committee (ASC) X12 was developed by the American National Standards Institute (ANSI) and the United Nations Electronic Data Interchange For Administration, Commerce, and Transport (UN/EDIFACT) was developed by the United Nations Economic Commission for Europe (UN/ECE). The format and the data that can be exchanged for any particular EDI business transaction are defined in the X12 EDI standards and EDIFACT EDI standards.

Although X12 is the prevailing standard in North America, EDIFACT is becoming more widely accepted internationally, especially in Europe and in Asia. Very recently, the X12 committee voted (as a whole) to adopt the EDIFACT syntax by 1997. Thus, the original X12 syntax will be phased out for many, or most, or possibly all applications [10].

2.7 EDI Communication Types

EDI only specifies a format for business information while the sending of the information is covered under other standards. EDI messages could be sent via postal service registered mail, or simply faxed between trading partners. These practices convert digital data into hard copy data that is reconverted into electronic information again on the end. It is possible to exchange the information in electronic format by

transactions conducted between trading partners. The possible communications to implement full EDI document exchange are:

2.7.1 Trading partner direct to trading partner (Point-to-point/Dial-up)

Trading partners directly link together over standard telephone lines through modems. Point-to-point connection between the sender's and recipient's computer, which must also have a modem and dedicated phone line. But in this way, there may exist the possibility of creating problems. There may also be timing problems the receiving computer may be in use, and it may not always be in receive mode.

Advantages

- The expenses are only from equipment and telephone service charges.
- It is easy to implement. The implementation needs unsophisticated technology.

Disadvantages

- The speed is low because it depends on modem and public telephone network.
- It is difficult to expand to serve a large number of trading partners.
- The security and accuracy of data cannot be guaranteed.

A leased line may be used instead of a telephone line to ensure higher security and speed but it is very expensive and justified only for large data transfers on a regular basis.

2.7.2 Trading partner to trading partner via Internet

Because of its universal reach, the Internet has become a good alternative for EDI. The same Internet connection used to send electronic mail

would be the one used to send EDI transactions. Software developers write EDI translators packages or templates for electronic mail system to handle EDI transactions.

Advantages

- Costs of Internet are modest.
- There is accessibility to large scale of trading partners because of well adopted communication standards; any business using the Internet can interact with any another.
- Implementation is easy.

Disadvantages

- Strong security policies are needed for commercial documents transmitted on public network.
- Confidentiality is in doubt. The encryption and authentication mechanisms are needed.
- Speed at low costs is still limited.

2.7.3 Trading partner to Internet Value Added Services (IVAS) to trading partner

Until recently, communicating via a VAN (Value Added Network) has been the only option. Today, it is possible to trade electronically via the Internet. Many Internet service providers respond to the needs of small to medium-sized businesses to be able to trade electronically without implementing full EDI with VANs. Some service providers (e.g., GE TradeWeb) already launched web sites to receive user's business document, translate into EDI standard, and send it to appropriate trading partners.

Advantages

- Prices may fall as service providers share telecommunications resources through Internet Protocols rather than maintain their own costly proprietary telecommunications services.
- It is easy to implement.
- A company is able to trade with a large number of trading partners because of global access.

Disadvantages

- Although service providers employ secure mechanisms, data security and confidentiality is not ensured on public network.
- There may be problem of speed on the network.

2.7.4 Trading partner to Value Added Network (VAN) to trading partner

EDI trading partners seldom communicate directly, but rather; use the services of third party VAN. An EDI VAN provides a proprietary communications network to connect trading partners, regardless of individual hardware platforms or communications protocols. Each partner connects to the VAN, and the VAN manages the connections to all the trading partners.

Advantages

- A trading partner has an ability to communicate with more trading partners who are subscribers of the same VAN and other connected VANs.
- There is no need to have highly-skilled people to implement services.
- Third party service provider serves professional EDI support.

- Security is higher due to sophisticated mechanisms provided by VAN.
- Risks in transmission reduce on a proprietary network. Speed is high.
- EDI service provider also offers other value added services such as translation, training, consulting.

Disadvantages

- Costs are higher for services, transmission, maintenance, translator software, etc.

2.8 Electronic Data Interchange in Retail Business.

Retailers, like other organizations, have examined the way in which computers can improve efficiency of their operations while reducing costs. As the cost of electronic point of sale equipment has fallen and its technical reliability and sophistication has increased, retailers have shown increased interest. Stores have increasingly used computers, minis and micros, to prepare accounts and invoices, analyze profits, calculate VAT and wages, maintain record and improve stock control of sales analysis. By the efficient handling, storage and analysis of data retailers can gain as much advantage as other organizations. Indeed, given the environmental and competitive pressures upon them the use of computers is frequently considered an essential method of reducing costs [9].

The greatest change in information management in the supply of consumer goods is happening now. Article numbering (AN), the system of allocating a unique code to every stock item in the world is revolutionizing the quality and quality of information that can be used to manage the supply chain. AN provides a "common business language" that can be used to support electronic data interchange (EDI). At the heart of the AN system is the bar code concept where each product line items has a

unique number. To be of value the idea requires a high level of participation by retailer and a method of exchanging information [5].

The role of bar code symbols in connecting EDI information to individual merchandise will become even more important in the future. Thailand now has already set up the Thailand Article Numbering Council (TANC), formed by the Thai Industrial Standards Institute (TISI), to take care of and announce standards for the bar code system. At this time, it is planned that the formal bar code system. At this time, it is planned that the formal bar code standard in Thailand will follow EAN-13 (European Article Numbering-13 digits)

Today's fast paced business environment demands the automated exchange of business documents between a firm and its vendors, customers, partners, and subsidiaries.

This need is driven by

- Increasingly complex global and international trading relationships.
- Enterprise-to-enterprise information sharing systems.
- Just-in-time manufacturing and inventory.
- Rapidly changing competitive environments.
- Customer-service demands.
- Partnering a fairly new concept wherein multiple companies work in concert toward the same objective, contract, or bid.

In this topic have proposed the essential of EDI system in retail business. The symptoms show up in several area[15]:

- Increase in price level due to the escalation of intermediate distribution cost.
- Merchandise dispatching and traffic concentrated in metropolitan area.
- Poor quality of commerce services.

- High turnover of commerce industry employee.
- Employ statistical analysis to enhance operating and management performance.
- Create a business automation environment, which promotes communication through streamlining of information channels.
- Strengthen shelving systems management; effectively manage product distribution to promote competitiveness.

The point out that while labor costs have soared relative to other factors of production, computers and communications equipment continue to decrease in price and improve in quality and speed. EDI offers a significant saving in labour cost's speed, responsiveness and certainly. By no means the least of EDI's benefits is the impetus the technology has provided to the development of information interchange standards[8].

2.9 Feasibility of Emergence EDI in Retail Business.

From the survey and analysis, Feasibility of emergence EDI in retail business is able to summarized[21].

The proposes possibility of corporation patterns, which can be categorized in four patterns.

- Direct to direct.(show as in figure 2.1)
- Cooperation of a first couple via a VAN.(show as in figure 2.2)
- Cooperation of a first couple via a public networks.(show as in figure 2.3)
- Cooperation of a stores and suppliers group via a VAN. (show as in figure 2.4)

2.9.1 Direct-to-direct/Dial-up

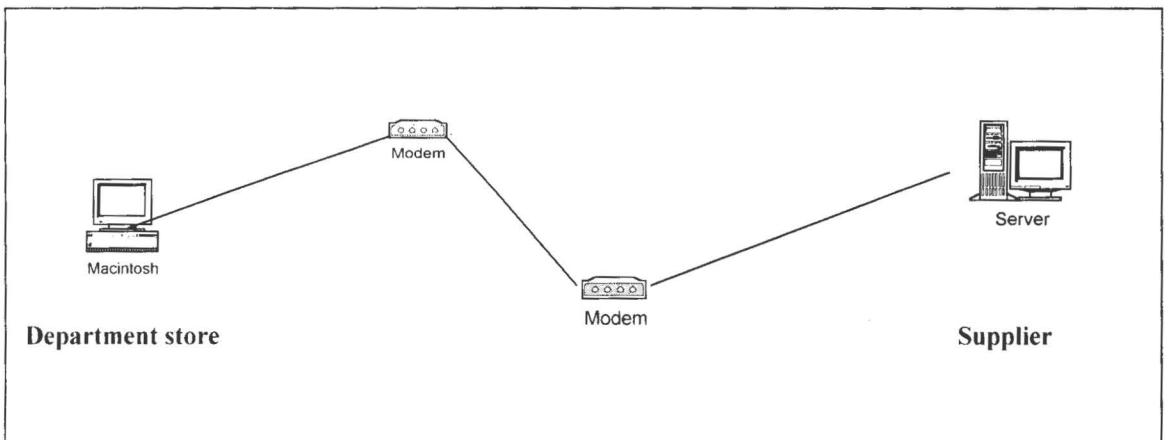


Figure 2-1: Feasibility of EDI implementation via dial-up

Two parties can contact each other through modems connected with telephone lines. This system requires agreement between the trading partners, such as: when will orders be transferred from buyer to supplier. To make supplier waiting to receive orders at the same times; standards for sending, which depends on the agreement; etc.

Strong Point

- Low costs. Most companies already have their computers. Adding high speed modems and payment for each call only adds minimal cost.
- It is easy to implement because of low complexity of technology (modem, telephone line).
- Trading partners do not concern much about format. It depends on the agreement.

Weak Point

- Highly dependent on the hardware and telephone line. This leads to problems of inefficiency. In cases when specification of hardware including modems are not optimized, slow speed and accuracy of data will be major problems.
- There are no system for confirmation and checking the results of sending.

- Time for sending. It requires the readiness of machine of both parties. Otherwise, it will consume very much time and not guarantee the security.
- If there are more numbers of trading partners, it will not be suitable to go this way. They will have the problems of standards, speed, security, and so on.
- Further, it is unable to support the large amount of data.
- It is can not reach the EDI concept, which is exchange the business documents with standard format.

2.9.2 Cooperation of department store and supplier as the first pairs via VANs



Figure 2-2: Feasibility of EDI implementation via VAN

The second possibility is the cooperation of a partner via service providers or VANs. Buyers and Supplier are required to have software translator for conversion between its application and EDI document standard. Both parties should use the same standard for connection. However, both parties can use different standards. If this case occurs, VAN is required to add value for conversion into the same standard.

There are two ways in communications method, hold on the line and mail box. With the first way, buyer and supplier can send messages to each other about anything because the service provider will reserve one channel for them. But the cost is very high. The second way is in sharing a channel of communication among trading partners. It is very widespread in abroad and seem to be practical if implemented in Thailand. Buyer sends message will be kept on mailbox of service provider. When suppliers accesses, it will get messages from its own mailbox.

Strong Point

- It is a faster implementation. Only the first two parties have the same level of readiness.
- It is easy to increase trading partners in the future.
- It has good security because the VANs will take care of it.
- It is very convenient because there is no need for readiness in sending and receiving.
- Messages can be left in mailbox.
- Buyers and Supplier can get services from value adding, such as e-mail, standard conversion, etc.
- The trading partners (department store and supplier) do not need to have highly-skilled technology people.

Weak Point

- It needs formal standard (any EDI standards) for connection.
- The first couple needs to share cost of investment and take risk from failure.
- It is dependent on VAN. If it is faced with some problems, that mean this couple can not contact each other.

2.9.3 Cooperation of department stores and suppliers via Public networks

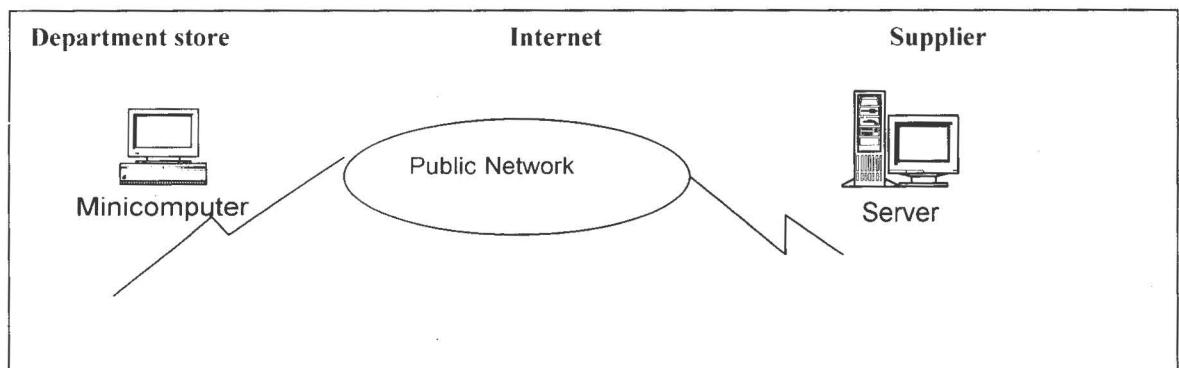


Figure 2-3: Feasibility of EDI implementation via public network.

Currently, this method is very popular in abroad since public networks play a major role in commercial sector. Many businesses try to modify itself to commercialize due to a large scale of people using these kind of networks. For Thailand, INTERNET is one of the very popular public network. Thus, the emergence of EDI in this way is possible. Trading partners who will use this way need to be a member of the network. However, this method do not have any value addition . They have to handle the software translation by themselves.

Strong Point

- It contributes low cost from economics of scale in public network.
- It is very easy and increase the number of trading partners because of the widespread usage of public network.
- It can provide the connection to different networks.

Weak Point

- Regarding software translator and other software if organization prefers in-house development, it will need many high-skilled people in development. If it prefers to outsource development, costs and efficiency for development are the factors that should be considered.
- Based on the nature of public network, it is not specific for commercialization. It needs to adapt so much to reach the concept.
- In public network, it is very essential to find the way to protect the security of data. Each organization may encode and decode its own data to protect the trading secret.
- In the future, problems of the large amount transactions in the public network may lead to be highly time consuming.

2.9.4 Cooperation of group of department stores and suppliers via VAN(Alliances)

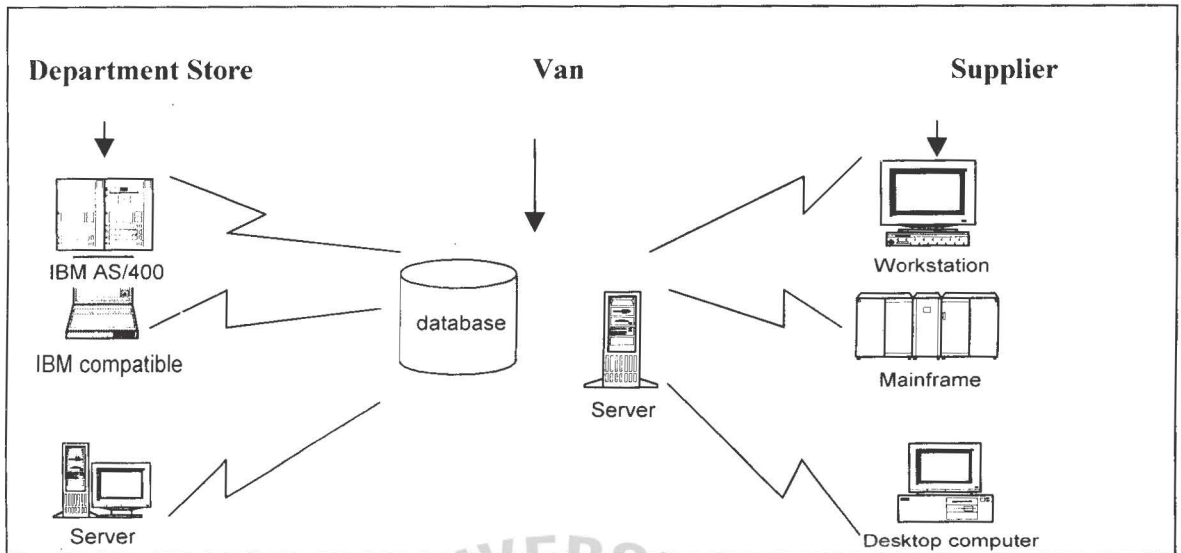


Figure 2-4: Feasibility of EDI implementation via VAN with many trading partners.

The concept of this method is the same as the second one. But this comes from cooperation of many organizations. To reach the concept of EDI and response with the facts of trading that it composes of many buyers and suppliers among group, starting EDI implementation with groups will make the peak benefits. One buyer can send data only once to many suppliers simultaneously.

Strong Point

- It is easy to increase trading partners in the future.
- It need highly formal standards.
- It can reduce cost and timing in case of sending transactions of buyers to many suppliers. It is a full efficiency of EDI concept.
- It is very convenience because VAN will take care it.
- It can get the services from value added.
- The trading partners (department store and supplier) do not need to have highly skill technology people.
- It is able to reach low costs from economics of scale.

Weak Point

- In practice, it is very difficult to start with this way because the readiness level of each organization is different.
- It is difficult to trace back in case of errors because of many users.
- If choose this way to start EDI implementation. The problems of human resource may be a serious one since many organizations need skilled people in the same time.

2.10 Factor for EDI Selection Types.

One important step in EDI implementation is the selection of EDI communication means. Most companies find that their trading partners make the decision for them. Most EDI users started implementation because of the pressure from their business partners. To be able to trade electronically with those influential partners, they tend to use the same means. Some considerations are taken into account when companies can select their own choices. There are 3 factors for selection EDI types.

2.10.1 Economic cost Factors

The general industries, the cost spent in developing new system, (including software, hardware, and personnel expense, etc. is an important factor for the executive office to judge whether adoption shall be considered [6]. The cost of setting up an EDI application not only includes the cost of settings up the links between trading partner, it also includes the cost of developing enabling software which integrates the EDI data into the existing application systems in the business operation cycle. The cost of this software is quite substantial[3]. It will cause an industry to suspend in application of EDI system.

The types of costs that will be incurred include[6]:

- Software/Hardware Costs
- Transmission Costs
- Training Costs
- Time Value Costs

2.10.2 Support Factors

2.10.2.1 Trading Partners Related Factors

Not all trading partners are ready to commit to the use of EDI. EDI is a kind of cooperative competition tool, a trade partner, in order to attain strategic performance, may request its cooperation partners to mutually transmit message and forms with it through EDI [6]. On the other hand, if there is few suitable electronic customers, they can not realize an edge over their competitors.

2.10.2.2 Service Areas Related Factors

Service areas have local and global.

2.10.3 Technical Factors

2.10.3.1 Data Security Related Factors

However, a concern with electronic transmissions is that a message could be intercepted and the information in the message revealed to an outside party, with neither the sender nor the receiver being aware of the interception. Two methods of data security address this auditing concern: data encryption and data authentication. Encryption is the coding of data to ensure secrecy. Authentication is sending both a coded and an uncoded message to ensure that data were not changed during transmission [6].

2.10.3.2 Ease of Implementation and Maintenance Related Factors

Implementing EDI requires the technical issues. Although understanding the details of exactly how EDI operates may take sometime, technologically EDI is not complex. Further, the EDI structure of standards, software, and networks is in place and is working. The technological implementation issues need do not usually present significant difficulties to most firms. Maintenance activity, EDI standards change frequently, which means that the software must be frequently updated. If the software is developed in-house, in-house maintenance will also need to be performed. However, if a commercial package is used, the maintenance will be performed by the software vendor [6]. The EDI processes include design, implementation, testing, training, support, and maintenance.

2.10.3.3 Expertise level need

Expertise level need is concern internal expertise and external expertise.

The implement of EDI requires cooperation and works from personnel in number of functional, staff with knowledgeable technical people, who can be used to get quick answers the problem. The number of people involved in EDI will depend upon the size of the company, the type of EDI system being used, the volume of transactions being transmitted, and the organizational priority placed on EDI [6].

CHAPTER 3

METHODOLOGY

In doing the research , I have used three methods; The methods were: document-based study , data Analysis and questionnaire & interview. In an attempt to develop the framework for selection EDI communication type in retail business.

3.1 Document-based Study

This process was conducted in order to identify out the characteristic of EDI types and their appropriateness for retail business.

3.2 Data Analysis (Decision-Base EDI model)

Analysis data was analyzed around three important issues on EDI implementation. The first issue was EDI on retail business and the analysis business case for supplier. The second issue was on EDI communication types. The works of each EDI communication types are presented including an advantage and disadvantage in each type. The third issue was on critical factor for selection EDI communication types. The factors on the selection of EDI communication types were analyzed to find out how each factor affected the selection.

The data analysis was put as the content of Decision-Base EDI model. The organizations can use the final result of this research to decide for their selection of EDI types.

Step of test the Decision Base - Electronic Data Interchange (DB-EDI) Model

Step 1 Give the percentage to 7 critical factors.

Step 2 Select the 1 method that user want to use in 7 critical factors.

3.3 Questionnaires

3.3.1 Selection of respondents

The research covered to study the effect of use DB-EDI model; that is, to see how the DB-EDI model can promote the use of the EDI in retail business and how it can also be applied for retail business. Thus, the sample of this research was a retail organization who plan to adopt EDI and current EDI users who have experience in the selection. The sample also consisted of firms from retail business in order to derive common results.

3.3.2 Questionnaire Formation

The first part of the questionnaire was designed to find three different sized respondents: small organizations, medium organizations and large organization. Questionnaires have collected information about the sample's characteristics, opinions on consideration for selection of EDI communication types. The questionnaire was piloted to test that all questions and instructions were clear and all questions meant the same to all respondents. An introduction letter for the study and explanation of terms also accompanied each questionnaire. The completed questionnaire is presented in Appendix A.

General Information Part

Questions 1-7 were designed to identify respondents' characteristics.

Users test DB-EDI model Part

Both users test DB-EDI model and planned adopters answered the rest of the questionnaire. *Questions 8-11* was to find out whether respondents use DB-EDI model and recommend from user test DB-EDI model. *Questions 12-15* was designed to obtain detailed information of how respondents will recommend of each critical factor. The information includes:

- Cost;
- Data security;

- Ease of implement and maintenance;
- Expertise level need;
- Advance operation system;
- Service area;
- Number of trading partners;

3.4 Conclusion

The conclusion was based on the result user test DB-EDI model. Conclusion about the effect of use DB-EDI model; that is, to see how the DB-EDI model can promote the use of EDI in retail business and how it applied for retail business.



CHAPTER 4

DATA ANALYSIS

Analysis data is analyzed around three important issues on EDI implementation. The first issue is EDI on retail business. The business analysis case for supplier. The second issue is on EDI communication types. The works of each EDI communication types are presented including advantage and disadvantage in each type. The third issue is on critical factors for selection EDI communication types. The factors on the selection of EDI communication types are analyzed to find out how each factor affected the selection.

4.1 EDI on retail business.

In the retail business, there are a number of environmental drivers today putting pressure on organizations of all sizes to convert from paperwork to electronic means. In some instances, a single organization or government agency might ultimately affect many trading partners through their implementation of EDI. It will soon be legislated in many economies that all customs documentation must be lodged electronically and paper form will cease to be acceptable.

In the top retailers in Thailand are becoming involved in implementing EDI. Therefore, hundreds of suppliers will be forced to comply with the demands of their larger and more influential trading partners. In some cases customers' demand for better service is also driving organization towards EDI.

The evidence is the fact that some large department stores and supermarkets held conferences to introduce EDI to their suppliers. Most conferences were jointly hosted by leading partners and their EDI network providers. Most large organizations enter into a business partnership with their network providers, hoping to get the best deal on pricing as

well as direct assistance in bringing potential trading partners to EDI implementation. In return for their efforts, network providers expect the opportunity to market their products and services to the trading partners of these corporate clients.

Other environmental drivers include:

- Flow-down affected from implementations of multi-nationals and large organizations;
- Global marketplace and the desire to remain viable in a highly competitive environment;
- Requirement to be more flexible and responsive to customer demands.

Most organizations - even the largest and most prestigious - find that implementing EDI typically involves a phased approach and consequently not all the desired functionality may be in place from the start. It is common for a large organization to convert their order process from paper-based to EDI first and undertake to change other processes later. The purchase order is typically the first document to be exchanged electronically because it is cost-justified and involved the fewest interruptions to the overall environment. However, this may be quickly followed by other transactions like invoices, delivery notices and functional acknowledgments.

A Definition of EDI in Relation to Other Forms of Communication

The whole bunch of electronic communications between trading partners is called electronic commerce. Faxes especially system generated faxes, e-mail information, CAD/CAM data exchange, image-raster exchange, direct data link, data exchange on proprietary formats and last but not least EDI.

E-mail is the exchange of free text information between persons. Meanwhile you may extend e-mail to system generated e-mail with a data structure and you then respond to this in a structured e-mail saying yes. I got the order so I will deliver in time. In the core, it sticks with text information. The e-mail is integrated, if at all, with an information system of one

partner ,not to both.

CAD/CAM and image raster information are important tools to speed up the product development cycle. These techniques are growing together with EDI using the same file transfer protocol (OFTP) and using an ODETTE message to transfer engineering data attached to the CAD/CAM or image-raster data.

Direct data link is directly connected to the application system of your trading partner. This form is often used in sales organizations in case of one partner only. This kind of integration is problematic with suppliers who normally have business with multiple customers. The same is true with proprietary formats. It does not work probably in a multiple partner environment.

EDI gives much further opportunities. EDI ties together computers exchanging business data. Three components define EDI.

- a) structured business data like an order, a delivery instruction, a dispatch advise or an invoice
- b) standards to describe these business data in EDI messages like X.12 or EDIFACT
- c) communication standards to make the computers to talk with each other.

More than that: The intention of EDI is the integration of application systems between trading partners and to synchronize information on both sides using a common technique and user surface for all the data exchange in a multiple partner environment. EDI does not require the two companies to have the same hardware or software.

This is possible because of the common standard followed by the EDI message and by the communication protocol. It is easy to write translation software when all the types of messages follow the same common structure. Again, by contrast e-mail and fax do not allow data to synchronize in information systems between trading partners. If a receiver wishes to transfer the information they contain into his own application system, he has to rekey it into a

form which they can access.

4.1.1 The Business Case for Suppliers

Where does this leave the smaller potential user? Total integration sounds fine if you are a corporate giant with an extensive computer system. What about the smaller supplier with a workforce of a dozen or so individuals with only one or two PCs?

Many of these suppliers are only capable of receiving delivery instruction messages and are not able to send EDI dispatch advice. The reason is easy. Receiving information, you do not need to integrate them into your application software. Creating a message you need an application software supporting all the data requested in the message. Much of these data are not used in the supplier environment and are for customer purpose only. It costs suppliers a lot of money to integrate all the requirements into their own application software.

On the other hand, there are big benefits using EDI in the right form. Having EDI integrated you will meet the customers' requirements. They do not want simple EDI on the supplier side. They want data quality. That needs integration.

With integration it is possible to produce all the shipment information and paper in one step. Based on one instruction an EDI dispatch advice message is produced for the manufacturer, a copy of it is sent to the carrier, simultaneously all the requested ODETTE shipping labels are provided without any contradictions to the ASN.

This helps to make identical the physical shipment with the shipment information. In case the EDI message is not available at the dock at the time the shipment arrives the supplier needs to produce a paper as a substitute for EDI. With integrated EDI, he can do his job in one step in a snap. That saves a lot of time and helps him to be much more accurate and competitive.

Last but not least, he can create automatically an invoice or a data set which will help him to compare system supporting the self-billing information with his shipments. And with

EDI, he can be assured that his original EDI dispatch advice information is used in the payment process the customer found some discrepancies in the receiving area which he already minimized by using integrated EDI.

Big supplier companies will still integrate these functionality into their system environment to get all the benefits. Other suppliers will have a nice standard materials management system optimizing their own operations and supporting the EDI requirements. Small suppliers may use a complete EDI software package supporting the whole process with a nice application surface having in the background file-transfer and converter functionality.

These software packages supporting the whole logistic cycle for multiple partners in the automotive industry, will increase data quality and will give all the benefits. Of course, there may be redundancies with the existing application software. The strategy will be to have some simple integration like price information attached to part numbers while leaving all the other systems untouched.

These PC based software packages for suppliers in the automotive industry are meanwhile available for a very reasonable price. In some countries especially in those without X.25 or ISDN available, a VAN may be an appropriate solution. The cost differs extremely. In other countries, the connection costs of X.25 or ISDN are prohibitive, so VANs are very welcome. Importance is the level of support in application software. Again, there are substantial benefits using EDI application software supporting and integrating the whole business process.

It has been shown how EDI has many advantages in comparison to a more manually based communications system. The full benefits of EDI are achieved when it is fully integrated with the other systems of the business. This allows for tighter control and be efficiency illustrated by the Just-In-Time technique. For the smaller user, EDI will be a way of retaining customers. With the change in business practices and the advantages it brings,

more and more businesses will want to communicate with trading partners who can use EDI. The result is that not only companies implement EDI for its core benefits but they will also adopt it as a means of business survival.

Majority of EDI in retail business comes from middleman with the believe in fair agreement. Making EDI a must for supplier. EDI helps functioning in the organization such as reduce capital. In the future, more EDI will be used. A group of supplier will force using invoice.



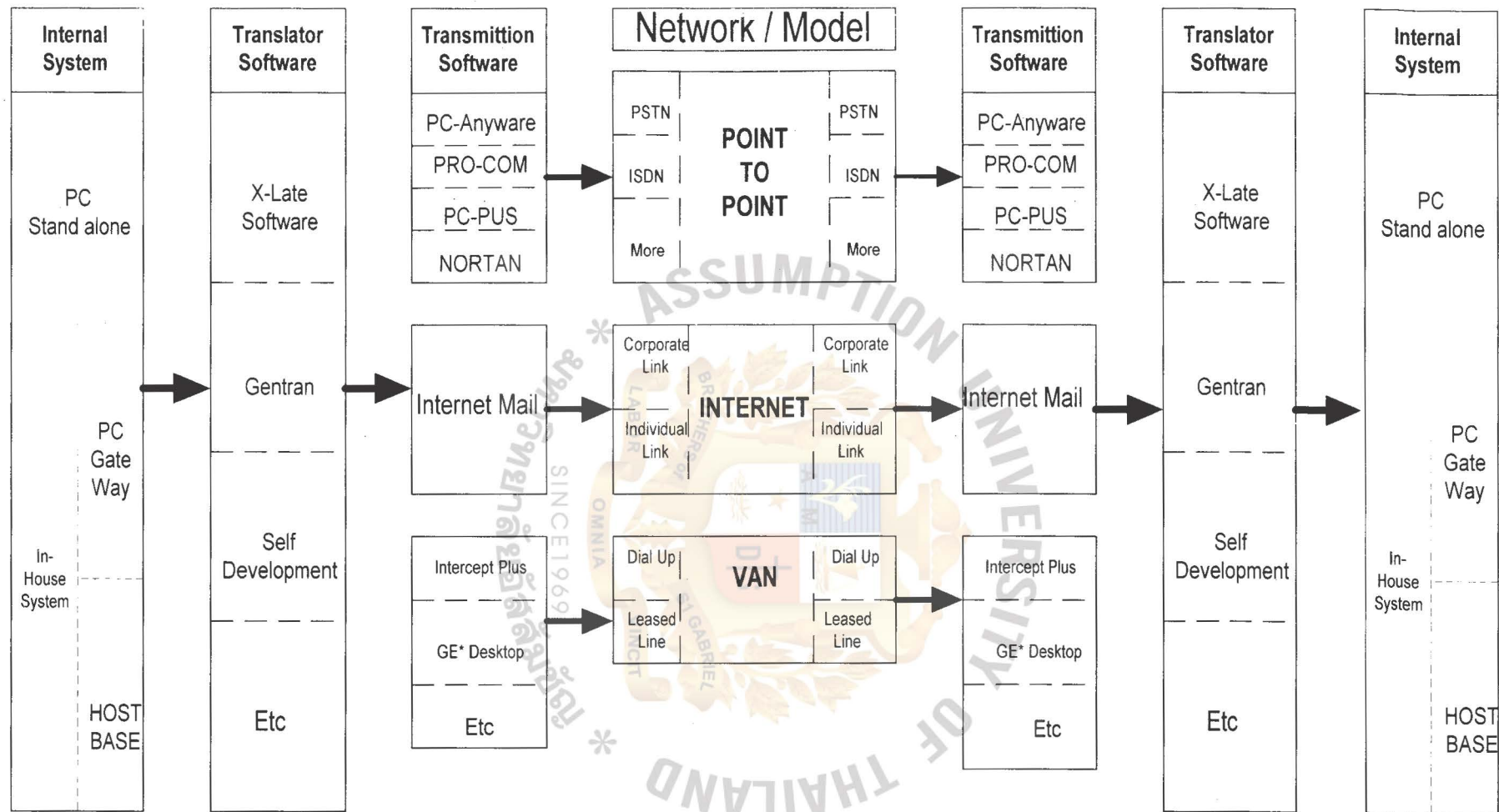


TABLE 4-1: THE EDI TYPES MODEL

4.2 The EDI communication types.

The idea behind EDI is fairly simple. EDI is the computer-to-computer exchange of business documents in a structured format based upon agreed-upon standards, and a communications link of some kind. At the sending location, information such as a purchase order is converted into an EDI transaction. The transaction is then sent electronically through either a Value Added Network (VAN), a direct link, or the Internet. At the receiving end, it is converted from the EDI format into a form, which the business can use. The following section presents different choices of transmitting EDI dale.

4.1.1 Point-to-point Link (Direct Link)

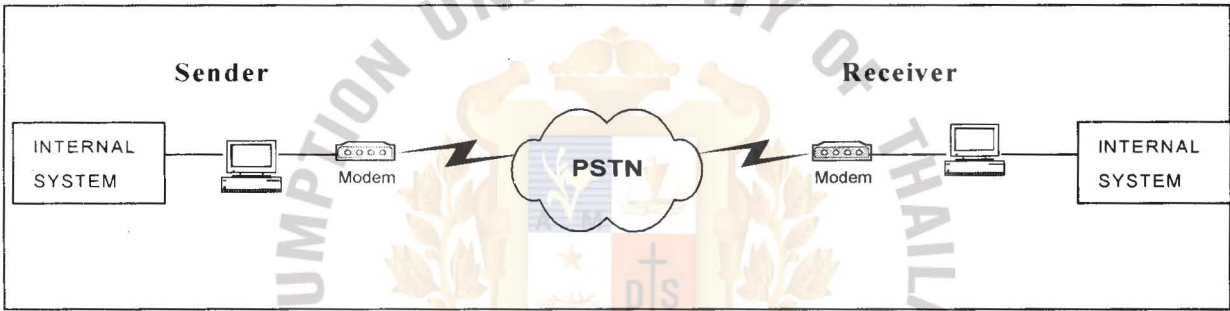


Figure 4-1 Feasibility of EDI implementation via point-to-point

EDI point-to-point link is a point-to-point network agreement connection between the sender and recipient's computer such as when will orders is transferred from buyer to supplier. This method makes receiver waiting to receive orders at the same times, standards for sending, which depends on the agreement of trading partners. This method must also have a modern and dedicate phone line. Trading partners are connected directly link together over standard telephone lines through modems.

Point-to-point link is an effective and cost-saving choice for a company, which has high internal expertise of computers and communications. This means are suitable for exchanging data within a limited number of trading partners who basically are subsidiaries and affiliates. Transmitting data to partners located outside Bangkok is possible since a

service boundary is limited by a telephone service. Implementation costs are low but a firm has to tradeoff with low security of public telephone network. Leased line or satellite may be needed with extra costs.

In Thailand, only a few companies employ this option because of its several limitations. A company trades electronically only among its subsidiaries or affiliates through this means. Most users put information on business documents into proprietary format and send them over a public telephone network. The receiving parties then access the system on scheduled time and pick up the data sent for them. The data later is translated back into normal business forms.

A company implementing this means needs advanced knowledge of computers, telecommunications to address such issues as how to communicate data among partners and integration EDI with in-house applications. Computer staff needs to be allocated to handle all processes including designing, setup, testing, maintenance, and providing all support. Normally, there are the existing staffs who are also responsible to other systems. Thus, the company can save a lot of implementation costs and ongoing costs whereby a lot of resources are needed. Another alternative is outsourcing of technology but the costs will be higher.

Normally, this means have been employed to trade only within affiliated companies since proprietary document format limits users from exchanging forms with outsiders. The system cannot handle other standards.

Exchanging documents over a public telephone line, user can trade without limitation of service area by setting up the system at each partner's premise, and they can transmit data to one another with only the normal telephone charge. The major problem of using a public telephone network is unavailability of facilities. In addition, the performance is questionable. This could be avoided by using leased line with higher costs. No dialing is required and data

can be transferred faster. Direct link option requires that operational sessions be scheduled in advance.

According to the responses, respondents established direct links to transmit EDI data with their trading partners. One retailer has been using the system for more than three years, before any local VAN launched services to exchange business documents among subsidiaries and affiliates. Headquarters installed systems on each sites linked together by dial-up lines. Software integrated with in house applications is required to transform business document such as purchase order, invoice, etc. In order to proprietary format and to transmit data directly to recipients' sites located in Bangkok and other provinces. Currently, this retailer has also expanded its network to a distributor included in the survey to facilitate ordering processes. Since documents are exchanged internally among subsidiaries, the firm finds that direct link is efficient, cost saving, and easy to implement.

The strong and weak point of direct link option are summarized as:

Strong Point

- It is easy to implement and maintain with knowledge of computers and communications because this means low complexity of technology (modem, telephone line)
- A firm traded electronically with limited number of partners, which basically are subsidiaries and affiliated.
- Implementation costs and on-going costs are low.
- A firm implements same option as its trading partner. This is best suited for companies with a small number of trading partners. If only 1-2 trading partner, this method is profitable. If number of trading increased, the cost were increase as well.

Weak Point

- In case of that there is more than one sender, if the sender at the same time the receiver will have to provide sufficient connecting numbers many senders.
- There is no system for confirmation and checking the results of sending.

4.2.2 EDI via INTERNET

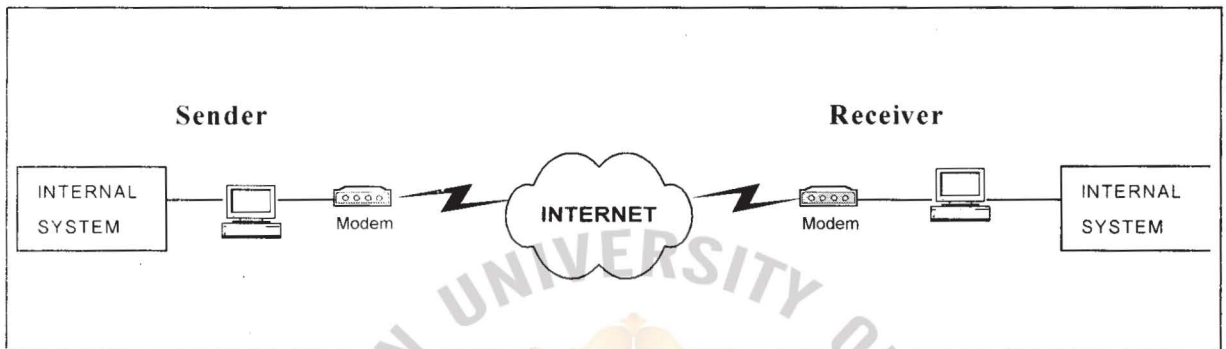


Figure 4-2 : Feasibility of EDI implementation via Internet.

Innovations with the Internet are creating new communication channels. The Internet offers businesses unlimited potential for reaching new trading partners and customers efficiently and cost-effectively. Though Internet is mostly used for electronic mail, information search, and file transfers, it is used increasingly for EDI.

Because of its universal reach, Internet becomes an alternative for EDI. The Internet can be used directly for exchanging EDI messages without going through VAN. Trading partners must agree on some details for the exchange. The same Internet connection used to send electronic mail would be the one used to send EDI transactions. Software developers write EDI translator, packages or templates for electronic mail system to handle EDI transactions. The messages can also be transmitted via File Transfer Protocol (FTP). However, only EDI on Internet through VAN has been addressed in Thailand. Therefore, the recommendations apply mainly to sends EDI message by attaching file with E-mail.

Example of use EDI on Internet is an EDI service provider that lets companies pay a fee to access the Internet EDI service with only a commercial Web browser, identification

code (ID) and password GE TradeWeb is the first forms-based EDI service on the world Wide Web (WWW). It does not require users to purchase hardware or software to participate in electronic trading. All required are a computer, Internet service and a Web browser to access electronic business forms from the WWW page. A sender gets into its account (using a password) and adds information in HTML format to be sent to a trading partner. GEIS's VAN will translate the data into ANSI or EDIFACT formats, and then send it along-either by the Internet or Intranet. This will better enable companies to trade electronically with their smaller suppliers and customers who lack in-house EDI capabilities, thus improving their productivity.

Although there are many positive aspects to the Internet, there are issues that require consideration.

The strong and weak point of EDI via Internet option are summarized as:

Strong Point

- It contributes low cost from economies of scale in public network and reduces telephone charge cost.
- It is very easy and increases the number of trading partners because of the widespread usage of Internet.
- Use of the Internet is the fact that EDI messages may be exchanged with any trading partner regardless of network being used. Because of its nature there are no interconnection issues to be faced when using the Internet. In addition trading partners need not have any specific agreements with third party before exchanging EDI messages. Finally, it is estimated that the cost of using the Internet for the exchange of the EDI messages is considerably lower than the cost of using a VAN for the same exchange.

Weak Point

- Regarding software translator and other software if organization prefers in-house development, it will need many high-skilled people in development.
- The method of send EDI message is not automatic, we have to manually export the attach file and transfer it in to EDI made.
- The exchange of EDI messages over the Internet is not secure and that acknowledgement of message delivery is not automatically provided.
- There are still some valid concerns relating to the use of Internet for EDI. These concerns revolve primarily around security, message tracking, audit trails, and authentication.

4.2.3 EDI VAN

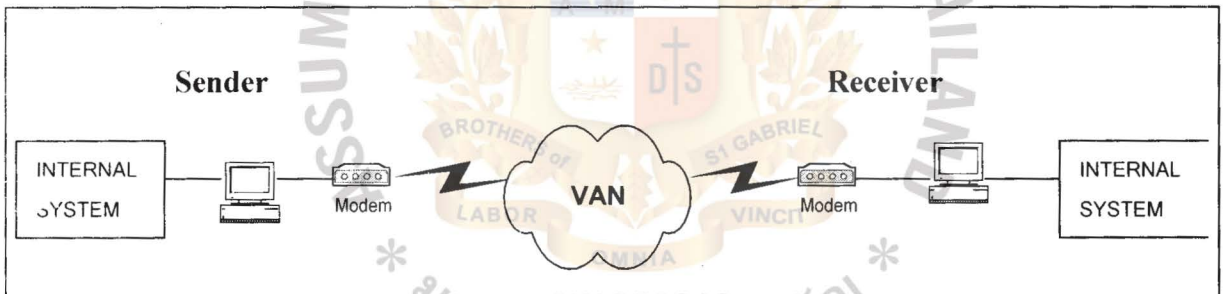


Figure 4-3: Feasibility of EDI implementation via VAN with many trading partners.

EDI VAN is a convenient and efficient alternative for a firm, which has low expertise or prefers to outsource technology. As an intermediary, a service provider handles all communications among trading partners. A firm can trade with a wide range of trading partners using accepted EDI standards. Worldwide communications are possible if VAN serves globally or interconnect to other VANs. Communications over a proprietary network are costly but high security is guaranteed.

Translation software is an additional software integrating with in-house application to

translate data between flat file; data file that uses fixed fields in defined order, and EDI standard. It is also used to transmit data between EDI user. Users require ensuring that software is easy to use, can easily integrate with back office, and can handle variety of document standards and document types. It will output the same flat file structure regardless of standard or version of standard. EDI users in different parts of the world use different EDI standards. ANSI X12 is widely used in North America, TRADACOM in the United Kingdom, and EDIFACT in Europe. If a user plans to trade globally, it is essential that third party network can handle multiple standards.

In Thailand, both public and private sectors increasingly encourage EDI usage. Thailand EDI Council (TEDIC) was, therefore, established to stimulate and support trading via EDI over the country. The development of EDI standard in Thailand is one of the Council's main responsibilities. The Council accepts global standard, EDIFACT, as an appropriate standard for usage in Thailand. A user must ensure that the selected VAN provide widely accepted standards in user's trading community.

New EDI trading partners seldom communicate directly, but rather, use the services of a third party Value Added Network (VAN). EDI VAN provides a proprietary communications network to connect trading partners, regardless of individual hardware platforms or communications protocols. Each partner connects to the VAN, and the VAN manages the connections to all the trading partners. Senders leave data in mailbox waiting for receivers to retrieve at a time of their own convenience. VAN also provides increased data security and other services such as converting documents through different formats and standards, and interconnection to other networks.

VAN is an electronic clearinghouse for data-a third party network that, in addition to the communication services it provides, offers skills, expertise, consultation, and educational

services. In essence, a VAN functions similarly to postal services. The main differences are that VANs function in a virtually paperless, highly-automated environment, and they also provide the "value-added" aspects (listed above) to communications services. Postal services receive mail from senders, sort it, and then deliver it to the intended recipient. Similarly, a VAN receives transactions from a sender and then places it in the electronic mailbox of the recipient. VAN acts as an intermediary between trading partners.

VAN establishes an electronic mailbox for each trading partner employing their services. A sending partner electronically transmits the business data to the VAN via modem and phone lines. The network receives the transactions, sorts them by receiver, and stores them in the receivers' mailboxes until they are picked up. VANs also provide security controls to ensure data integrity. Each organization with a VAN account will have a password that must be used to access their mailbox. Data encryption is another example of a security control provided by VANs. These controls are used to ensure that an organization's computer software, data, and programs are protected against any unauthorized access, disclosure, or modification. In addition, VANs offer data translation services between different EDI standards, provide an automatic backup system and archiving plan for all mailbox contents, and offer error detection and correction services.

The services VANs provide, in addition to the transmission of business data, are the value-added component of the network. Most VANs allow businesses to retrieve messages at the same time they deposit their outgoing transactions. Additionally, most VANs provide 24-hour, 7-day-a-week access.

VAN in Thailand

1. Thai Trade Net

Thai Trade Net is an industry standard and electronic trading network of Thai Trade

Net Co., Ltd. This network acts like an open yet secure information highway that can effectively and reliably link not only your resources and computers within your organization, but also your customers, distributors and trading partners around the world. Thai Trade Net is the key to building an integrated electronic trading community that will increase your productivity, improve customers satisfaction and open up more business opportunities.

In the past, Thailand has had many local VANs. Example is Thai Tradenet (Samart Telecom Group) compete in the market. By the end of 3rd quarter of 1998, Shinawatra closed EDI service and transfer his customers to use service from Thai Tradenet. These two companies use the same format and join in develop mapping program for their customers, so it has no problem to transfer to the other one.

Services

Two of the major services available through Thai Trade Net are Electronic Data Interchange (EDI) and Electronic Mail (E-Mail). In addition to providing these services, Thai Trade Net Co., Ltd. also provides assistance and consultancy services to ensure that you are able to fully realize the benefits available by using this technology. The Service includes guidance on the use of standard messages and on integrating electronic trading into the supply chain and into your in-house business applications.

Availability

The service is available to users 24 hours a day, 7 days a week. The client help desk is available and fully staffed. The help desk follows strict call logging procedures to ensure that any problem is efficiently resolved.

Connectivity

Users can connect to the Service using a variety of telecommunications protocols:

- (a) Asynchronous dial up

Interconnects to other service Providers

The Thai Trade Net EDI Service is able to interconnect to other EDI Service providers. This enables users to exchange EDI messages with a huge international communication in a secure and reliable manner.

Thai Trade Net will accept and manage process in the commonly used public and private EDI standards including.

(a) UN/EDIFACT

Cost	Baht
1. One-Time-Charge	
Mailbox	5,000 /Mailbox
Translation Software	7,000 /License
Application Interface program	5,000 /Doc. type
2. Monthly Charge	
Mailbox's maintenance	800 /Mailbox
3. Transaction Charge	
Sender	4 /1,024 characters
Receiver	4 /1,024 characters

Table 4-2: Thai Trade Net's Service Charge.

Strong Point

- It is easy to increase trading partners in the future.
- It needs highly formal standards.
- It can reduce cost and timing in case of sending transactions of buyers to many suppliers.

- It is convenience and good security because VAN will take care of it. It can get the services from value added.
- The trading partners do not need to have highly skill technology people.
- Message can be left in mailbox.

Weak Point

- Traditional cost of VAN is expensive.

4.3 The critical factor for selection EDI communication types.

4.3.1 ECONOMIC COST FACTOR.

The cost factor is important factor to be considered in selection EDI types because these factor to specify investment of use EDI. Cost factor of use EDI is depends on the implement cost of each mean.

The possible types of implementation costs are:

- Translation software costs
- Software maintenance costs
- Internal software development costs
- Hardware costs
- Training costs
- Additional resource costs
- Consulting costs
- Maintenance costs

The costs vary for each alliterative. Implement cost from EDI point-to-point has low costs since existing resources can be used in all processes of the implementation. Usage costs

depend on normal charge of telephone service or leased line.

Implementation costs from VAN are much higher and they also vary from VAN to VAN. The costs basically include translation software costs, mailbox fee, transmission costs, and consulting costs. Most VANs have no charge for expansion of trading partners. EDI via Internet has lower usage costs.

4.3.2 SECURITY FACTOR.

4.3.2.1 Data security

Data security is important factor to be considered selection EDI types. Because since exchanging business documents every user need high security for allowing only authorized users to send or receive data and preventing data change or loss during transmission. Security concern still occurs on trading over public networks, either telephone network, since transmitted data could be lost or tapped. This factor depends on network availability and reliability. Unavailability of network can cause substantial loss of business. It is important to ensure that EDI network will be available in desired time, connection can be established easily, and data is transmitted accurately and in a timely manner.

EDI VAN provides a higher degree of security through a proprietary network particularly designed for electronic trading. Most of trading information exchanged over the network is confidential. Therefore, a firm needed data security mechanism and access control. Only authorized persons can access and alter data.

4.3.3 TECHNICAL FACTOR

4.3.3.1 Ease of Implementation and Maintenance (hardware, software)

Ease of implement and maintenance are important factor to be considered selection EDI types because this factor relate in-house business applications that are integrated with their EDI software. This factor depends on communication types to implement EDI document

exchange. Risk of failure in implementing a selected option depends on many issues such as possibility of implementation, efficiency of operation, end users' agreement, trading partners involvement, and so on.

Example of implementation of EDI point-to-point is not easy. Users have to handle such complicated issues as managing communications among trading partners and developing EDI integration software. Meanwhile such services can be offered by a VAN.

The processes include design, implementation, testing, training, support, and maintenance. Company use service VAN requires only a few people to operate. VANs provide customer support (e.g., a telephone number or electronic mail address). Service providers have to be able to solve problems occurring in time.

4.3.3.2 Expertise Level Needed (technology, expertness)

Expertise level needed is important factor to be considered selection EDI types because this factor to specify develops implement EDI. This factor depends on a basic level of expertise in organization. Example Company with minimal internal expertise regarding computers, modems, communications, and EDI is a good candidate for using VAN. VAN which has an outstanding expertise in EDI and experience in users' businesses is considered first. Point-to-point needs somewhat high expertise such as knowledge of computers, telecommunications to address such issues as how to communicate data among partners and integration EDI with in-house applications.

4.3.3.3 Advance Operation system

Advance operational system factor to be considered selection EDI types because this factor to specify maintains operation schedule time. Examples, EDI point to point provide machines are kept ready for receiving the incoming data. EDI VAN provides storage for data waiting to be retrieved at any convenient.

4.3.4 SUPPORT FACTOR

4.3.4.1 Service Areas

Service areas factor is depend on consideration of company exchanging documents that across provinces or countries. It is necessary for selection use communication networks. Example using public telephone network is appropriate to directly connect among partners with in the country. Leased line or satellite may be alternatives and it provides cost-effective in the long run. Example some local VANs have capability to send data outside Bangkok through satellite communications network thus the charge is only a local call charge. EDI via Internet is a good option for sending data globally since users do not pay for the international connection charge. VANs also provide international connection but users have to pay for the international connection charge.

4.3.4.2 Number of Trading Partners

Number of trading partners factor is depends on expansion agreement of trading partners each EDI communication types. Example EDI Point-to-point is more suitable for exchanging documents only within affiliate or subsidiary company because EDI point-to-point has a disadvantage of trading partner expansion since data in proprietary format is transmitted. The proprietary standard seems suitable for only trading within a group since outsiders may not agree with the same standard. The problem will arise when a user needs to trade with outside partners since standard and system need to be modified. Meanwhile VAN is a good option for trading with outside parties since globally accepted standards are employed. In addition, VAN, an intermediary, is needed to facilitate communications among several parties so those partners can trade efficiently. Number of trading partners through VAN is high especially when it connects to other networks. The number of trading partners on Internet is also high because of its global reach. Furthermore, trading partner expansion

can be done easily.

4.4 Critical success factor (EDI POINT TO POINT)

4.4.1 Economic cost factor

4.4.1.1 Cost

Cost	Baht
1. Translation Software or (self development)	20,000 up 50,000
2. Software PC anywhere	15,000-25,000
3. Hardware + modem + telephone number	30,000-40,000
<u>Total</u> Start up cost	80,000-100,000

Usage cost	Baht
1. Monthly fee (telephone service)	100
Local call	3 / unit call
Long distance call	Long distance rate

Table 4-3 : Cost of EDI Point-to-point

- **Start up cost depend on implementation cost and Usage cost depend on dial-up connection.**

The communication cost for using public telephone network is minimal cost. Most companies have already had their computers and telephone lines (PSTN) before. Adding high-speed modems. Transaction cost depends on dial-up connections. Local calls are five at 3 baht per call and distance and airtime receive remote calls.

4.4.2 Security factor

4.4.2.1 Data security

Data security depends on technique of file transfer.

Insufficient security system for sends and receive data. Because this method use technique of file transfer the message. Data is sent as is.

In this case, firm has to tradeoff with low security of public telephone network. Data security did not have secure because in this case use the public telephone line often cut off so low redundant data. Normally the modem on their provider side is opened all the time, thus making it easy to "hack" in.

No data encryption

In case of encryption, none data encryption is implemented. The firms can develop security system by themselves and need advance knowledge of computer for creating this feature in system.

4.4.3 Technical factor

4.4.3.1 Ease of implement and maintenance

Easy implementation and maintenance because use PSTN.

It is easy to implement with knowledge of computers and communications.

The implementations for EDI Point-to-point are

Hardware	1 modem, 1 telephone line, PC computer 1 set
Software translate	EDI to text file or text file to EDI
Software transfer	PC anywhere software

4.4.3.2 Expertise level need

Expertise level need depend on technology of telephone line and expertness.

The networks of this mean low complexity of technology that has modem, public telephone line for setup network for receive and send EDI message but

programmer will be needed to program the application to translate EDI to text file and text file to EDI.

4.4.3.3 Advance operation system

- **Need to advance operation system**

The sending and receiving parties have to access the system on scheduled time and to pick up the data sent and received. The data later is translated back into normal business forms. This mean option requires that operational sessions be scheduled in advance.

4.4.4 Support factor

4.4.4.1 Number of trading partners

- **Limit of trading partners**

This means is suitable for exchanging data within a limited number of trading partners who basically are subsidiaries and affiliates. If there are more numbers of trading partners, it will not be suitable to go this way. They will have the problems of standards, speed and security. Example: If trading partner is increase, firm will have to increase telephone connection of, which at a certain level will not be beneficial. Since 1 telephone line can support 1 sender: 1 receiver. If the partners have increase, time for sending will limit, because machine must work all times and the chance of receives data is least.

4.4.4.2 Service area

- **Local of service area**

Because of EDI point-to-point exchanging data over a public telephone line, user can trade without limitation of service area within the country. By setting up at each partner's premise, they can transmit data to one another with only the rate of telephone charge.

However, this type of model is recommended for local access of which the telephone airtime is charged at a fixed rate. Long distance call can also be made with a higher cost.

4.5 Critical success factor (EDI INTERNET)

4.5.1 Economic cost factor

4.5.1.1 Cost

Cost	Baht
1. Software translation or self development	20,000 up50,000
2. Software maintenance + modem + ISP service charge	30,000-40,000
<u>Total</u> Start up cost	60,000-65,000

Usage cost	Baht
1. Monthly fee (internet service)	1,000
2. Monthly fee(telephone service)	100
3. Local call, Long distance call	3 / unit call

Table 4-4: Cost of EDI via Internet

- **Start up cost depend on implementation cost and Usage cost depend on fix cost 3/unit call.**

Implementation cost is cheap. Only e-mail, browser and modem. On going cost is more beneficial since it contributes startup low cost from economics of scale in public network. Example using this means international firms who need to communicate with their headquarters or other trading partners in foreign countries with low access costs. The Internet offers a flat rate, volume and time-of-day independent pricing structure for data transmission.

4.5.2 Security factor

4.5.2.1 Data security

- **Data security depends on technique of file transfer.**

Since data will be transferred as attachments of e-mail, it is known that data has to travel to and from varied hosts before arriving at its destination host server, that makes it unsafe to deliver crucial information without certain or appropriate preventing procedures.

- **It has data encryption**

In public network, it is very essential to find the way to protect the security of data. Each organization may encode and decode its own data to protect the trading secret.

Strong security policies are needed for commercial documents transmitted on public network. The Internet is highly redundant, offering the ability to route data along alternate paths.

4.5.2.2 Ease of implement and maintenance

- **Easy implementation and maintenance because use internet.**

The implementations for EDI via Internet are

Hardware 1 modem, 1 telephone line, PC computer 1 set

Software translate EDI to text file or text file to EDI

Software transfer Microsoft Internet Explorer

In this case EDI via Internet connection used to send electronic mail would be the one used to send EDI transactions. Software developers write EDI translators, packages or templates for electronic mail system to handle EDI transactions. The messages can also be transmitted via File Transfer Protocol (FTP).

4.5.2.3 Expertise level need

- **Expertise level need depend on expertness.**

Firm will require a computer, Internet service and a web browser to access electronic business forms from WWW page. A firm gets into its account (using a password) and adds information in HTML format to be sent to trading partners. Firm has low expertise level need because Internet services provider support translate the data into EDI formats, and send it by Internet.

4.5.2.4 Advance operation system

- **Not need of advance operation system**

Not need the advance operational system because the ISP provides storage for data waiting to be retrieved at any convenient in the mailbox.

4.5.3 Support factor

4.5.3.1 Number of trading partners

- **Unlimited Number of trading partners**

This mean is a good choice for a firm, which needs to trade globally with low costs. It is very easy and increase the number of trading partners because of the widespread usage of public network. There is accessibility to large scale of trading partners because of well adopted communication standards, any business using the internet can interact with any another.

The Internet is a physical collection of computers connected by common protocols. At another level though, the Internet can be thought of as a distributed medium, offering some important advantages for doing EDI. For instance, the Internet has hundreds of thousands of connected global hosts, and tens of millions of users.

In addition, Internet-based EDI is simplified through the use of the Domain Name

Service (DNS), which centrally registers and maintains the names and addresses of all machines connected to the Internet.

4.5.3.2 Service area

- **Global of service area**

Firm use this method requires global area, because this method use on internet. This method is a good choice for a firm which needs to trade globally with low costs. The Internet's decentralized structure makes adding new hosts relatively easy it scales well, and the Internet supports high bandwidth communications technologies.

4.6 CRITICAL FACTOR (EDI VAN)

4.6.1 Economic cost factor

4.6.1.1 Cost

Cost	Baht
1. Start up cost (Installation charge)	45,000-50,000
1. Usage cost Monthly fee	1,200
Transaction Charge	
Sender	4 /1,024 characters
Receiver	4 /1,024 characters

Table 4-5:EDI VAN services charge.

- **Start up cost depend on installation charge and Usage cost depend on transaction charge.**

This method has expensive costs basically include translation software costs, mailbox fee, transmission costs, and consulting costs. Costs are higher for services, transmission, maintenance, and translator software.

Typically, VAN services both three types of costs: start-up costs, usage costs, and interconnection costs.

- **Start-up costs**

The costs include translation software cost, network usage fee, mailbox charge, and probably software application costs if needed. Most EDI have no charge for expansion of trading partners.

- **Usage costs**

The charge is based on use of VAN's services. Typically, a user pays according to volume of usage. Most VANs charge twice for each transaction to both sent and received data. Fixed cost schedule, a predefined price for services regardless of transmitted transaction volume, may be used.

4.6.2 Security factor

4.6.2.1 Data security

- **Data security depends on support from VAN.**

Since exchanging documents users need high security, many security features are offered by VAN particularly designed for electronic trading. Authentication and encryption techniques are provided by EDI. They protect transmitted data from being disclosed and changed. Digital signature is another technique to ensure that the intended recipients can only open EDI transactions.

Typically, security mechanisms are provided through network and translation software. Some basic features are:

- *Access control*

Only authorized user can gain access to data through identification code and password. VAN should also have an agreement with their trading partners to confirm

the confidentiality of subscribers' data.

- *Data tracking*

This feature tracks the progress of EDI data and reports back to ensure that data has not been lost or changed during transmission. And, trading partner receives data as sent. EDI translator evaluates the transmission for completeness and generates functional acknowledgment that is transmitted back to the original sender.

- *Transmission security*

Users require security in transmission to ensure that unauthorized person cannot access data or network and data be transmitted to the correct receiver. Backup ends data recovery is needed in case of data loss. Users should also notice interruption and delay of EDI. Average processing time should be known. Users should also know how long data is stored in mailbox waiting to be retrieved.

4.6.2.2 Ease of implement and maintenance

- **High ease of implementation and maintenance from VAN support.**

Since VAN provides implementation and maintenance services thus the programmer should be knowledgeable enough to obtain maximum though put for VAN providers. So it makes ease of implement and maintenance high.

This method provides a proprietary communications network to connect trading partners, regardless of individual hardware platforms or communications protocols. It needs highly formal standards. Each partner connects to VAN, and manages the connections to all the trading partners.

Maintenance is also important for updating software and document standards, which are still changing. To work effectively and efficiently with EDI system, software should be easy to use and integrated seamlessly with in-house applications.

Like any other software, EDI software needs regular updates to provide new features. Purchasing a software maintenance contract is advisable since it guarantees automatic updates. EDI standards keep changing to serve more needs of users. If additional transactions are implemented, translation software must be updated.

4.6.3 Expertise level need

- **Expertise level need depend on from VAN support.**

Service providers should have high EDI expertise to ensure a customer's efficient operations. Knowledge of client's business may be an advantage. EDI service providers will study a customer's business processes to help designing the system. They will supervise the entire project - planning, implementation, training, and trading partner link ups. Current customers can help examine a service provider's qualification. Number of subscribers may indicate reputation and reliability.

4.6.4 Advance operation system

- **Not need of advance operation system**

Since VAN offer services for mailbox. Senders leave data in mailbox waiting for receivers to retrieve at a time of their own convenience. VANS provide mailbox services, and sort EDI documents from a sender to receiver mailbox, allowing the receiver to pick up EDI documents when convenient. They provide other services such as translating flat files from the subscriber's application into EDI formatted documents, interfacing with other VANS, and supporting various telecommunications modes and data transfer protocols. So user did not need advance operation system.

4.6.5 Support factor

4.6.5.1 Number of trading partner

- **Unlimited of trading partners**

Each partner connects to the VAN, and the VAN manages the connections to all the trading partners. So this method can support unlimited of trading partners.

4.6.5.2 Service area

- **Global of service area**

Worldwide communications are possible if this mean serves globally or interconnect to other. This method can give local area and global up to user want to use.

The other main advantage is that several messages addressed to different trading partners can be sent in one transmission because there is only one immediate receiver, the VAN. Charging normally consists of an annual fee with increased costs based on the number of trading partners a company wishes to communicate with and the volume and type of data sent.

There are a few drawbacks to this approach. With an indirect link there is a slight delay in messages reaching a trading partner. This may hinder the Just-In-Time approach, which makes EDI so attractive to trading partners.

4.7 Flowchart of DB-EDI model

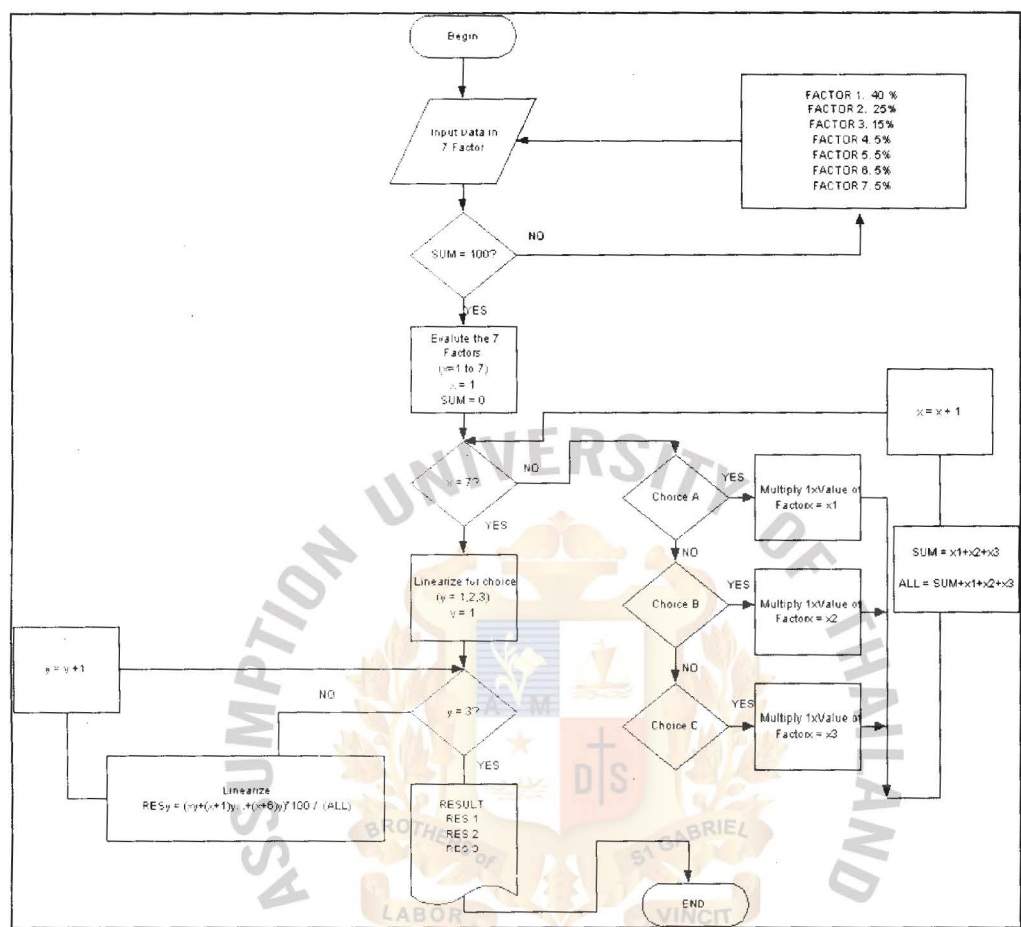


Figure4-4 Flowchart of DB-EDI model

Figure4-4 shows flowchart of DB-EDI model. The DB-EDI model is to determine the important step of chooses EDI communication types. The first step is input valve of percentage on each factor. The second step is choosing 1 method of each factor. The third step is output of percentage on each factor.

4.8 The output of tests this DB-EDI model.

Table 4-6 show importance average percentage of factor for selection EDI communication types in small size. The importance is indicated by percentage average of each factor. The first rank is cost which is indicated by percentage average63.8 %. The next important factor is data security with percentage average 12.6%.

Factor/ % that user give	1	2	3	4	5	6	7	8	9	10	% average
Cost	55	60	65	63	70	64	65	66	62	66	63.8
Data security	15	12	10	17	8	16	15	12	13	14	12.6
Ease of implement and maintenance	7	8	7	6	6	5	6	7	8	5	6.5
Expertise level need	8	5	8	4	5	5	4	4	2	5	5
Advance operation system	6	5	5	4	4	5	5	6	6	2	4.9
Number of trading partner	4	6	2	3	2	3	3	2	5	3	3.4
Service area	5	4	3	3	5	2	2	3	4	5	3.8

Table 4-6: The average percentage of factor for selection EDI communication types in small size.

Table 4-7 show importance average percentage of factor for selection EDI

communication types in medium size. The importance is indicated by percentage average of each factor. The first rank is cost which is indicated by percentage average 49.7%. The next important factor is data security with percentage average 21.5%.

Factor/ % that user give	1	2	3	4	5	6	7	8	9	10	% average
Cost	55	52	49	50	48	47	52	44	46	54	49.7
Data security	26	20	25	21	22	28	15	18	21	19	21.5
Ease of implement and maintenance	6	8	10	14	16	18	10	15	10	12	11.8
Expertise level need	3	5	4	5	4	2	8	8	8	5	5.2
Advance operation system	5	5	4	3	5	2	5	5	8	3	4.5
Number of trading partner	3	5	5	2	2	2	5	5	4	2	3.3
Service area	2	5	3	5	3	1	5	5	3	5	3.5

Table 4-7: The average percentage of factor for selection EDI communication types in medium size.

Table 4-8 shows importance average percentage of factor for selection EDI communication types in large size. The importance is indicated by percentage average of each factor. The first rank is cost which is indicated by percentage average 40%. The next important factor is data security with percentage average 30%.

Factor/ % that user give	1	2	3	4	5	6	7	8	9	10	% average
Cost	38	35	34	28	30	35	28	32	28	29	32.7
Data security	40	45	48	43	42	47	44	40	49	35	43.3
Ease of implement and maintenance	7	5	4	9	8	7	8	8	8	15	7.2
Expertise level need	5	3	4	5	5	6	5	5	5	6	4.9
Advance operation system	5	2	5	5	5	2	5	5	3	5	4.2
Number of trading partner	2	5	2	5	5	2	5	5	2	5	3.8
Service area	3	5	3	5	5	1	5	5	5	5	4.7

Table 4-8: The average percentage of factor for selection EDI communication types in large size.

Conclusion of the selection critical factor in the S-M-L business, the main concern around cost factor since budget for investment. Firms have to consider price structure carefully to ensure that they agree with all costs for selection EDI types. The second concern is data security since exchanging business document needs high security for allowing only authorized users to send or receive data and preventing data change or lose during transmission. The output of critical factors for EDI type selection is:

1. Cost

Important of cost implementation will decrease as firm size increase since small firms have to careful about investing.

2. Data security

As data and transaction increase the security will be concern more. Since small firm with small data transfer data transfer, the security is not much as large firm.

3. Ease of implement and maintenance

An equal level of concern will be on ease of implement and maintenance, a fractal increase will happen on large firm. Ease of implement and maintenance will be more important as size growth.

4. Expertise level need

An equal level of concern will be on expertise level need, a fractal decrease will happen on large firm. Expertness people for large organization will decrease.

5. Advance operation system

An equal level of concern will be on advance operation system, a fractal increase will happen on large firm. System setting will be more important as size growth.

6. Number of trading partners

As equal level of concern will be on number of trading partner, a fractal increase will happen on large firm. The power of negotiation will increase as size of firm.

7. Service area

As equal level of concern will be on service area, a fractal increase will happen on large firm. The distance of each branch will not be to far from head quarter, which make service area smaller and easier.

Table 4-9 show importance average percentage of output for selection EDI communication types in small size. The importance is indicated by percentage average output of selection EDI types. The first is EDI via Internet, which is indicated by percentage average 48.9%. The second is EDI point-to-point indicated by percentage average 45.7%. The third is EDI VAN indicated by percentage average 5.2%.

EDI/ % that user give	1	2	3	4	5	6	7	8	9	10	% average
EDI point-to-point	55	31	65	30	70	29	65	25	62	27	45.7
EDI via internet	36	65	30	67	23	69	30	72	29	68	48.9
EDI VAN	9	4	5	3	7	2	5	3	9	5	5.2

Table 4-9: The average percentage of output for selection EDI communication types in small size.

Table 4-10 show importance average percentage of output for selection EDI communication types in medium size. The importance is indicated by percentage average output of selection EDI types. The first is EDI via internet, which is indicated by percentage average 50%. The second is EDI point-to-point, which is indicated by percentage average 15.4%. The third is EDI VAN, which is indicated by percentage average 3.7%.

EDI/ % that user give	1	2	3	4	5	6	7	8	9	10	%average
EDI point-to-point	9	13	15	16	18	20	15	20	14	14	15.4
EDI via internet	89	82	82	79	79	79	80	75	83	81	80.9
EDI VAN	2	5	3	5	3	1	5	5	3	5	3.7

Table 4-10: show importance average percentage of output for selection EDI communication types in medium size

Table 4-11 show importance average percentage of output for selection EDI communication types in large size. The importance is indicated by percentage average output of selection EDI types. The first is EDI VAN, which is indicated by percentage average 79.9%. The second is EDI via Internet, which is indicated by percentage average 12.2%. The third is EDI VAN, which is indicated by percentage average 3.7%.

EDI/ % that user give	1	2	3	4	5	6	7	8	9	10	%average
EDI point-to-point	7	5	4	9	8	7	8	8	8	15	7.9
EDI via internet	10	12	10	15	15	5	15	15	10	15	12.2
EDI VAN	83	83	86	76	77	88	77	77	82	70	79.9

Table 4-11: show importance average percentage of output for selection EDI communication types in large size.

In small business is suitable alternative for EDI point-to-point and EDI via Internet. Because invest EDI point-to-point and EDI via Internet, compare the implementing level and security is not needed much for setup.

In medium business is suitable alternative for EDI via Internet. Because EDI via Internet easy to implement because it is cheap than EDI point-to-point connection is easier and expensive level needed is not so high.

In large business is suitable alternative for EDI VAN. Because large organization will benefit most from the strong point of EDI VAN however EDI via internet connection is still a need for dealing business with other small and medium organization.



CHAPTER 5

CONCLUSION AND REFERENCES

To serve the objectives of the study, this chapter presents requirements of use DB-EDI model about how it can promote the use of EDI communication types in retail business and how it can also be applied for small-medium-large business.

5.1 Conclusion

Before applying the DB-EDI model to retail business, the organizers should understand that EDI is an electronic communication between registered parties that exists only when there is a connection. Therefore, DB-EDI model can be applied for retail business that needs communication and data exchange. The DB-EDI model can be used for organizational communications such as decision making for choosing EDI traditional purchasing processes in retail business. The basic requirement of DB-EDI model utilization is the readiness of companies to process documents with computers or to change from paper work to electronic data processing.

Conclusion for the selected DB-EDI model in retail business. Many small, medium and large sized retail business that used this test model have accepted the output. The outputs of the DB-EDI model are accurate answer for the user need and users applications for the company. The DB-EDI model has benefits for companies, because this model represents the decision-making framework of EDI communication types within retail business. Small, medium and large sized retailers have needs in the use of EDI types. Because different critical factors are important, a number of them depend on the size of business.

Based on the DB-EDI test model, survey many mistakes occurred within the model when use of words that is a specific choice in the users selection, examples of high data security and the lowering of costs. Almost all users choose high quality and low cost. So this

model must not use such words, and change to the word that is suitable for the selection of EDI. The problem for some companies that didn't implement EDI before it was founded was that the user did not understand the content of this DB-EDI model. So the test model must take time to explain this to the user. Other companies that implemented EDI prior to this was satisfied about the output from the test DB-EDI model. Because the output of model is from the same company that implemented the EDI types.

To successfully implement and use DB-EDI model in a company, important comment should be addressed.

1. Planning of implementation process.

As in any information technology from DB-EDI model, careful planning and preparation are required to minimize problems, failure, and cost overruns. Good planning requires allocating adequate resources and gathering necessary information of needs. To implement DB-EDI model, company needs someone, either an employee or an external consultant hired on a temporary basis, which can provide a basic level of expertise and organize an EDI effort. This person may work together with the external expert available from a service provider of an EDI project.

2. Level of computerization.

A certain level of computerization is required before implementing DB-EDI model. Companies that have been using computers for some time are better able to judge the impact of the technology on their business and already have experience in adopting and integrating new technologies.

3. Cooperation of trading partners.

EDI cannot be isolation. At least one trading partner needs to be involved in the process. A good partner should have an active interest in the success of an EDI project and is ready to make necessary commitments to achieve it. An experienced partner can provide

valuable advice, training, and support.

4. Organizational commitment.

Management needs to be supportive and committed to the new technology. They must have a clear idea of the strategic and operational benefits of EDI as well as sufficient knowledge of EDI. End users should also be involved in the implementation process right from the start.

5.2 Recommendations for further study.

To study this research, the author limited the scope in several conditions. The author would like to suggest several areas for further study related to the topic of EDI in Thailand.

- Study the effects of use DB-EDI model which is expected to be the solution of promoting DB-EDI model to small-medium-large businesses. The studies should indicate how many forms of result user test and how to apply them for any business.
- Study the effects of use DB-EDI model that have on any business organizations such as success and failure of applying them to business, and reluctance and adaptation of business personnel to the coming technologies.

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APPENDIX A

QUESTIONNAIRE

Selection framework of EDI types in Decision-Base EDI model

This questionnaire is a part of the thesis study on the topic of "A Decision -Base EDI model to select EDI communication types." The survey method is conducted to gather the opinion after test a Decision -Base EDI model. Yours information is needed for further work on the thesis.

The researcher certifies that the questionnaires will be used only for academic research and confidentially will be maintained. Please be frank and open-minded in answering the questions. After completing the questionnaire, kindly **return it** by **mail or fax** within 2 weeks. If you have any questions or suggestions, please contact the researcher by:

Mobile Phone no.	(01) 3133184
Fax no.	4387528
E-mail address	kang_it@yahoo.com

Your participation is greatly appreciated. Thank you for your cooperation.

Kangsadan Tejatassanasunthorn

Senior Student

* Master of Science in Information Technology
Assumption University

Questionnaire

General Information

Company size: _____

Name of company: _____

Respondent's position in the organization: _____

1. Year company founded : _____

2. What type of organization is yours?

☐ International ☐ Joint venture ☐ Domestic

☐ Import - export ☐ Other(Please Specify): _____

3. What industry your organization is categorized?

☐ Retail ☐ Wholesaler ☐ Manufacturing

☐ Transportation ☐ Health car/Insurance ☐ Government

4. How many employees are there in your company?

☐ Less than 50 persons ☐ 50-200 persons ☐ More than 200 persons

5. What is your company's fixed asset?

☐ Less than Baht 20 million ☐ Baht 20-100 million ☐ More than Baht 100 million

Recommend from user test Decision-Base EDI Model

6. Do you accept the Decision-Base EDI model after test?

☐ YES (ACCEPT) ☐ NO (NOT ACCEPT)

7. Do you think that the Decision-Base EDI model can be apply in your company?

☐ YES ☐ NO

8. Approximately how many percent that user gives in each factor?

Factor	%
1. Cost	
2. Data security	
3. Ease of implement and maintenance	
4. Expertise level need	
5. Advance operation schedule	
6. Number of trading partner	
7. Service area	
Sum	100

9. What is the output of selection EDI in this DB-EDI model?

EDI types	%
EDI POINT-TO-POINT	
EDI VIA INTERNET	
EDI VAN	

10. What are the main reasons for implementing DB-EDI model?

11. How does the firm implementing EDI?

12. Which EDI type is the firm using?

13. What are advantage and disadvantage of using these ways compare to the other ways?

14. How DB-EDI provides benefits to the firm’s industry?

Thank you for help



APPENDIX B

DB-EDI MODEL



DECISION-BASE MODEL

STEP 1 USER PLEASE GIVE THE VALUE OF PERCENTAGE TO EACH FACTOR

FACTOR	CONTENT OF FACTOR	%
1. COST	1.Usage Cost 2. Start up Cost	70
2. DATA SECURITY	1. Access Control & Network	15
3. EASE OF IMPLEMENT & MAINTENANCE	1.Ease of implementation 2.Ease of maintenance 3. Application integration	5
4. EXPERTISE LEVEL	1.Internal Expertise (technology,programmer)	2
5. ADVANCE OPERATION SYSTEM	1. Operational system of send & receive data.	3
6. NUMBER OF TRADING PARTNERS	1.Trading Partners already use 2.Trading partner expansion	2
7. SERVICE AREA	1. Areas of services (across provinces, countries)	3
	Please proceed to next step	100

STEP 2 PLEASE SELECT THE ONE METHOD THAT WANT TO USE IN EACH FACTOR

COST		Select 1
	Start up cost depend on implementation cost and Usage cost depend on dial-up connection. Because this method company already have their computers and telephone lines before and adding high speed modem so reduce start up cost . Usage cost or transaction cost depends on dial-up connections. Local calls are 3 baht per call and remote calls are received by distance and air-time.	<input type="checkbox"/>
METHOD A	Start up cost depend on implementation cost and Usage cost depend on fix cost 3/unit call. Because this method has only e-mail, browser and modem. On going cost is more beneficial since it contributes startup low cost from economics of scale in public network.	<input checked="" type="checkbox"/>
METHOD B	Start up cost depend on installation charge and Usage cost depend on transaction charge. This method has expensive costs basically include translation software costs, mailbox fee, transmission costs, and consulting costs. Costs are higher for services, transmission, maintenance, and translator software.	<input type="checkbox"/>
METHOD C		

DATA SECURITY

Select 1

Data security depend on technique of file transfer. Because this method use technique of file transfer the message. Data is sent as is. In case of encryption, none data encryption is implemented. The firms can develop security system by themselves and need advance knowledge of computer for creating this feature in system.

METHOD A

Data security depend on technique of file transfer. Since data will be transferred as attachments of e-mail, it is known that data has to travel to and from varied hosts before arriving at it's destination host server, that makes it unsafe to deliver crucial information with out certain or appropriate preventing procedures.

METHOD B

Data security depend on support from VAN. Since exchanging documents users need high security, many security features are offered by VAN particularly designed for electronic trading. Authentication and encryption techniques are provided by EDI. They protect transmitted data from being disclosed and changed. Digital signature is another technique to ensure that the intended recipients can only open EDI transactions.

METHOD C

EASE OF
IMPLEMENT &
MAINTENANCE

Select 1

Easy implementation and maintenance because use PSTN.
The implementations for EDI Point-to-point are
Hardware 1 modem, 1 telephone line, PC computer 1 set
Software translate EDI to text file or text file to EDI
Software transfer PC anywhere software

METHOD A

Easy implementation and maintenance because use internet.
The implementations for EDI via Internet are
Hardware 1 modem, 1 telephone line, PC computer 1 set
Software translate EDI to text file or text file to EDI 1 set

METHOD B

Software transfer Microsoft Internet Explorer

High ease of implementation and maintenance from VAN support. Since VAN provides implementation and maintenance services thus the programmer should be knowledgeable enough to obtain maximum though put for VAN providers.

METHOD C

EXPERTISE
LEVEL NEED

Select 1

Expertise level need depend on technology of telephone line and expertness.
The networks of this method low complexity of technology that has modem, public telephone line for setup network for receive and send EDI message but programmer will be needed to program the application to translate EDI to text file and text file to EDI.

METHOD A

Expertise level need depend on expertness.
Firm will require a computer, Internet service and a web browser to access electronic business forms from WWW page. A firm gets into its account (using a password) and adds information in HTML format to be sent to trading partners. Firm has high expertise level need because programmer will be needed to program the application to translate EDI to text file and text file to EDI. It must translate the data into EDI formats, and send it by Internet.

METHOD B

Expertise level need depend on from VAN support. Service providers should have high EDI expertise to ensure a customer's efficient operations. EDI service providers will study a customer's business processes to help designing the system. They will supervise the entire project - planning, implementation, training, and trading partner link ups.

METHOD C

ADVANCE
OPERATION
SYSTEM

Select 1

Need to advance operation system. The sending and receiving parties have access the system on scheduled time and pick up the data sent and received. This process must have translated EDI to text file or text file to EDI. The data later is translated back into normal business forms. This mean option requires that operational system in advance.

METHOD A

Need to advance operation system. Although the ISP provides storage for data waiting to be retrieved at any convenient in the mailbox, but firm must have translated EDI to text file or text file to EDI when receive data.

METHOD B

		<p>Not need to advance operation system. Since VAN offer services for mailbox. Senders leave data in mailbox waiting for receivers to retrieve at a time of their own convenience and sort EDI documents from a sender to receiver mailbox, allowing the receiver to pick up EDI documents when convenient. They provide other services such as translating flat files from the subscriber's application into EDI formatted documents, interfacing with other VANS, and supporting various telecommunications modes and data transfer protocols . So user did not need</p>	
METHOD C		advance operation system.	
NUMBER OF TRADING PARTNERS			Select 1
		<p>Limit of trading partner. This method is suitable for exchanging data within a limited number of trading partners who basically are subsidiaries and affiliates. If there are more numbers of trading partners, it will not be suitable to go this way. They will have the problems of standards, speed and security. Example: If trading partner is increase, firm will have to increase telephone connection of, which at a certain level will not be beneficial. Since 1 telephone line can support 1 sender: 1</p>	
METHOD A		<p>Unlimit of trading partner. This mean is a good choice for a firm, which needs to trade globally with low costs. It is very easy and increase the number of trading partners because of the widespread usage of public network. There is</p>	
		accessibility to large scale of trading partners because of well adopted	
METHOD B		communication standards, any business using the internet can interact with any	
		<p>Unlimit of trading partner. Each partner connects to the VAN, and the VAN manages the connections to all the trading partners. So this method can support</p>	
METHOD C		unlimited of trading partners.	
SERVICE AREA			Select 1
		<p>Local service area. Because this method exchanging data over a public telephone line, user can trade without limitation of service area within the country. By setting up at each partner's premise, they can transmit data to one another with only the rate of telephone charge. However, this method is recommended for local access of which the telephone airtime is charged at a fixed rate. Long distance</p>	
		call can also be made with a higher cost.	
METHOD A			

Global service area. Firm use this method requires global area, because this method use on internet. This method is a good choice for a firm which needs to trade globally with low costs. The Internet's decentralized structure makes adding new hosts relatively easy it scales well, and the Internet supports high bandwidth communications technologies.

Local / Global service area. Worldwide communications are possible if this mean serves globally or interconnect to other. This method can give local area and global up to user want to use.

The percentage
result are as follow

EDI POINT TO POINT	22.00
EDI VIA INTERNET	73.00
EDI VAN	5.00



โมเดลช่วยในการเลือกใช้ชีวิต					
ผู้ใช้งานจากค่าเปอร์เซ็นต์ให้กับแต่ละองค์ประกอบ					
ขั้นที่ 1	ส่วนประกอบ	เนื้อหาของส่วนประกอบ			
		1. ค่าใช้จ่ายเริ่มต้น			
1. ค่าใช้จ่าย		2. ค่าใช้จ่ายทั้งหมด			70
2. ความปลอดภัยข้อมูล		1. การควบคุมและเน็ตเวอร์ก			15
		1. เครื่องมือ			
		2. การบำรุงรักษา			
3. เครื่องมือและการบำรุงรักษา		3. การรวมอุปกรณ์			5
4. ระดับความต้องการผู้เชี่ยวชาญ		1. ความเชี่ยวชาญภายใน(เทคโนโลยีและโปรแกรมเมอร์)			2
5. การบริหารระบบ		1. ขั้นตอนการรับและการส่งข้อมูล			3
		1. ผู้ให้บริการทั้งหมดมาใช้บริการ			
6. จำนวนของผู้ให้บริการ		2. การขยายตัวของผู้ใช้บริการ			2
7. พื้นที่บริการ		1. ข้ามจังหวัดและต่างประเทศ			3
		ผลรวมไม่เกิน 100 %			100
ขั้นที่2	กรุณาเลือกหนึ่งวิธีในแต่ละแฟกเตอร์ที่คิดว่าเป็นวิธีที่เหมาะสมที่สุด				
ค่าใช้จ่าย		ความสำคัญของค่าใช้จ่ายจะลดลงตามขนาดของบริษัทที่เพิ่มขึ้นเช่นถ้าบริษัทที่มีขนาดเล็กก็จะมีควมระวังในการลงทุนมากขึ้น.		เลือก 1 วิธี	
		ค่าใช้จ่ายเริ่มต้นขึ้นอยู่กับค่าใช้จ่ายเครื่องมือและค่าใช้จ่ายทั้งหมดขึ้นอยู่กับการณ์โทรศัพท์ เพราะบริษัทส่วนใหญ่ที่ใช้วิธีนี้คือคอมพิวเตอร์และสายโทรศัพท์อยู่แล้ว. ค่าใช้บริการสื่อสารข้อมูลขึ้นอยู่กับการณ์โทรศัพท์ซึ่งมีค่าใช้บริการสื่อสารข้อมูลท้องถิ่นและค่าใช้บริการสื่อสารข้อมูลทางไกล.			
วิธีที่ 1			0	FALSE	70
		ค่าใช้จ่ายเริ่มต้นขึ้นอยู่กับค่าใช้จ่ายเครื่องมือและค่าใช้จ่ายทั้งหมดขึ้นอยู่กับการณ์โทรศัพท์ครั้งละ 3 บาท เพราะวิธีนี้มีเพียงแค่อินเตอร์เนต, เซิร์ฟเวอร์และโมเด็ม. ลดต้นทุนการสื่อสารเพราะเสียค่าใช้จ่ายเพียง3บาทต่อครั้งในการใช้อินเตอร์เนต			
วิธีที่ 2			1	TRUE	70
		ค่าใช้จ่ายเริ่มต้นขึ้นอยู่กับค่าติดตั้งและค่าใช้จ่ายทั้งหมดขึ้นอยู่กับการณ์บริการทางการสื่อสาร วิธีนี้ค่าใช้จ่ายค่อนข้างแพงรวมทั้งซอฟต์แวร์ที่ใช้ในการแปลง, ค่าเมมโมรี่, ค่าใช้จ่ายในการสื่อสาร, ค่าใช้จ่ายเกี่ยวกับที่ปรึกษา, ค่าใช้จ่ายที่สูงเกี่ยวกับการณ์บริการ, ค่าบำรุงรักษาซอฟต์แวร์ในการแปลง.			
วิธีที่ 3			0	FALSE	70
ความปลอดภัยข้อมูล		มีข้อมูลยิ่งมากขึ้นเท่าไรความสำคัญของความปลอดภัยทางข้อมูลก็เพิ่มมากขึ้นเท่านั้น เช่น ถ้าบริษัทที่มีขนาดเล็กก็จะมีข้อมูลไม่มากเท่ากับบริษัทที่มีขนาดใหญ่.		เลือก 1 วิธี	
		ความปลอดภัยทางข้อมูล ขึ้น อยู่ กับ การ แปลง ไฟล์ เพราะวิธีนี้ใช้ระบบการเข้ารหัสไฟล์ของข้อมูล. ส่งข้อมูลอย่างไรข้อมูลก็เป็นแบบนั้น. โปรแกรมของการเข้ารหัสจะไม่มี. บริษัทสามารถพัฒนาระบบความปลอดภัยได้โดยการพัฒนาขึ้นเอง.			
วิธีที่ 1			1	TRUE	15
		ความปลอดภัยทางข้อมูลขึ้นอยู่กับแปลงไฟล์ เมื่อแปลงข้อมูลทีแบบไปกับอินเตอร์เน็ตเขาไม่สามารถรู้ได้ว่าข้อมูลซึ่งไปทีหลายโหนดก่อนที่จะถึงโหนดเจฟเวอร์ซึ่งอาจจะทำให้ไม่ปลอดภัยทางข้อมูลทีปราศจากการระบวนการป้องกัน.			
วิธีที่ 2			0	FALSE	15
		ความปลอดภัยทางข้อมูล สูง ขึ้น อยู่ กับ การ รับ รอง จาก แวน เมื่อมีการแลกเปลี่ยนเอกสารของผู้ใช้ซึ่งมีความต้องการความปลอดภัยทางข้อมูลทีสูง. แวนมีการออกแบบเพื่อการค้า. ทางแวนมีเทคนิคการพิสูจน์สิทธิ์และการเข้ารหัสและมีการป้องกันข้อมูลจากการส่งข้อมูล.			
วิธีที่ 3			0	FALSE	15
เครื่องมือและการบำรุงรักษา		ความสำคัญของเครื่องมือและการบำรุงรักษาจะเพิ่มขึ้นตามขนาดของบริษัทที่เพิ่ม.		เลือก 1 วิธี	
		ง่าย คือ การ ใช้ เครื่อง มือ และ การ บำรุง รักษา เพราะ ใช้ สาย โทรศัพท์ เครื่อง มือ ของ EDI point to point มี ฮาร์ดแวร์ 1, โมเด็ม 1, สาย โทรศัพท์ 1, คอมพิวเตอร์ 1 เครื่อง, ซอฟต์แวร์แปลงEDIเป็น text file หรือ text file เป็น EDI, pc anywhere ซอฟต์แวร์.			
วิธีที่ 1			0	FALSE	5

ง่าย ต่อ การ ใช้ เครื่อง มือ และ การ บำรุง รักษา เพาะ ไร่ อิน เตอร์ เน็ท เครื่องมือของEDI Internet มีสารคดีแวร์ 1, โมเด็ม 1, สายโทรศัพท์ 1,คอมพิวเตอร์พีซี 1 เครื่อง, ซอฟต์แวร์ที่แปลง EDI เป็น text file หรือ text file เป็น EDI, internet explorer ซอฟต์แวร์.

วิธีที่ 2

0 FALSE

5

0

ง่ายต่อการใช้เครื่องมือและการบำรุงรักษาเพราะรับรองจากหน่วยงานให้บริการเครื่องมือและการบำรุงดั่งนั้นจึงมีโปรแกรมเมอร์ที่มีความรู้เพียงพอ.

วิธีที่ 3

1 TRUE

5

5

ระดับ ความ ต้องการ ผู้ เชี่ยว ความสำคัญขอระดับความต้องการผู้เชี่ยวชาญจะลดลงตามขนาดของ
ชาญ

บริษัทที่เพิ่มเป็นความต้องการผู้เชี่ยวชาญจะลดลงในบริษัทใหญ่. เลือก 1 วิธี

ระดับความต้องการผู้เชี่ยวชาญขึ้นอยู่กับเทคโนโลยีของสายโทรศัพท์และผู้เชี่ยวชาญ ในเปิดเครือข่ายนี้ไม่มีความซับซ้อนทางเทคโนโลยีมีเพียงแค่มอเด็ม,สายโทรศัพท์สำหรับสร้างเปิดเครือข่ายผู้รับและส่งข้อความอีดีไอโปรแกรมเมอร์จะมีความต้องแปลงอีดีไอเป็นเท็กไฟล์และเท็กไฟล์เป็นอีดีไอ.

วิธีที่ 1

1 TRUE

2

2

ระดับ ความ ต้องการ เชี่ยว ชาญ สูง ขึ้น อยู่ กับ ผู้ เชี่ยว ชาญ บริษัทจะได้รับคอมพิวเตอร์,อินเตอร์เน็ตและเว็บเบราว์เซอร์. บริษัทจะมีการใช้เน็ทคีย์หรือพาสเวิร์ดและเพิ่มรูปแบบHTML. บริษัทจึงมีความต้องการผู้เชี่ยวชาญสูงเพราะโปรแกรมเมอร์จะมีความต้องแปลงอีดีไอเป็นเท็กไฟล์และเท็กไฟล์เป็นอีดีไอ. มีการแปลงข้อมูลในรูปแบบอีดีไอและส่งผ่านทางอินเตอร์เน็ต.

วิธีที่ 2

0 FALSE

2

0

ทางผู้ให้บริการมีการบริการเกี่ยวกับผู้เชี่ยวชาญที่ค่อนข้างสูงและมีการศึกษากะบวนการทำงานของลูกค้านำเสนอข้อบกพร่องระบบเพื่อเพิ่มประสิทธิภาพ. ซึ่งทางผู้ให้บริการมีการวางแผน,เครื่องมือ,การฝึกอบรมและการเชื่อมจำนวนผู้ใช้
บริการ.

วิธีที่ 3

0 FALSE

2

0

การบริหารระบบเกี่ยวกับคา ความสำคัญของการบริหารระบบเกี่ยวกับตารางเวลาจะเพิ่มตามขนาด
ตารางเวลา

ของบริษัที่เพิ่มขึ้น. เลือก 1 วิธี

มีความต้องการการบริหารระบบเกี่ยวกับตารางเวลา การส่งและรับข้อมูลมีการควบคุมระบบบนตารางเวลาของการรับและส่งข้อมูล. กะบวนการนี้มีการแปลงอีดีไอเป็นเท็กไฟล์และแปลงเท็กไฟล์เป็นอีดีไอ. เมื่อข้อมูลหลังจากการแปลงจะอยู่ในรูปแบบฟอร์มธุรกิจดั่งนั้นในวิธีนี้จึงมีความต้องการการบริหารระบบเกี่ยวกับตารางเวลา.

วิธีที่ 1

0 FALSE

3

0

มีความต้องการการบริหารระบบเกี่ยวกับตารางเวลา ในวิธีนี้ทางผู้ให้บริการทางอินเตอร์เน็ตคอยให้ความสะดวกในการเก็บข้อมูลและคอยข้อมูลที่ผู้เก็บเอกสารแต่ยังต้องคำนึงการแปลงอีดีไอเป็นเท็กไฟล์และแปลงเท็กไฟล์เป็นอีดีไอเมื่อมีการรับและส่งข้อมูล.

วิธีที่ 2

1 TRUE

3

3

ไม่มีความต้องการการบริหารระบบเกี่ยวกับตารางเวลา ทางแผนมีการบริการผู้เก็บเอกสาร,เอกสาร, ผู้ส่งเอกสารสามารถที่จะเอกสารในผู้เอกสารเพื่อให้ผู้รับสามารถนำเอกสารมาอ่านในเวลาที่เหมาะสมก็ได้. ซึ่งให้การบริการเช่นการแปลงอีดีไอเป็นเท็กไฟล์และแปลงเท็กไฟล์เป็นอีดีไอและมีการแปลงแฟ้มไฟล์ในรูปแบบเอกสารอีดีไอ, การดูแลเกี่ยวกับเทคโนโลยีทางการสื่อสาร.

วิธีที่ 3

0 FALSE

3

0

จำนวนของผู้ใช้บริการ

อำนาจในการต่อลงจะเพิ่มขึ้นตามขนาดของบริษัที่เพิ่ม. เลือก 1 วิธี

จำกัดจำนวนของผู้ใช้บริการ ในวิธีนี้เหมาะกับการแลกเปลี่ยนใบจำกัดจำนวนของผู้ใช้บริการซึ่งมีขอบเขต. ถ้ามีจำนวนผู้ใช้บริการมาก, มันจะไม่เหมาะสมกับในวิธีนี้. ซึ่งทำให้มีปัญหาในความเร็วในการส่งข้อมูลและความปลอดภัยของข้อมูล. ตัวอย่างเช่นถ้าจำนวนผู้ใช้บริการเพิ่มมากขึ้น,บริษัทก็จะมีการเพิ่มจำนวนเบอร์โทรศัพท์. ซึ่งอาจทำให้ไม่คุ้มทุน. ดังนั้นโทรศัพท์เครื่องจะเหมาะกับผู้ส่ง 1 : 1 ผู้รับ.

วิธีที่ 1

1 TRUE

2

2

จำกัดจำนวนของผู้ใช้บริการ ในวิธีนี้เป็นวิธีที่ดีสำหรับบริษัทซึ่งมีความต้องการที่ติดต่อกันจากที่ถุก. มัน เป็นวิธีที่ง่ายและช่วยเพิ่มจำนวนของผู้ใช้บริการโดยวิธีของอินเตอร์เน็ต.

วิธีที่ 2

0 FALSE

2

0

ไม่ จำกัด จำนวน ของ ผู้ ใช้ บริการ แต่ละผู้ใช้บริการคิดค่านวนและทางจัดการในการติดต่อกับผู้ใช้บริการ. ดังนั้น ในวิธีทางแนวได้คือดูแลให้ผู้อื่นแล้ว.

วิธีที่ 3

0 FALSE

2

0

ระยะทางของแต่ละสถานี เส้นทางรถไฟไทยตอนบนที่พบรถ เรเวนด้า ระยะทางของแต่ละสถานี ไม่ไกลจากบริษัทหนึ่ง ทำให้ง่ายต่อการให้พื้นที่บริการ.

พื้นที่บริการในท้องถิ่น
เพราะในวิธีนี้มีการแลกเปลี่ยนข้อมูลอยู่บนสายโทรศัพท์, ผู้ให้บริการมีการค้าซึ่งปราศจากการจำกัดในท้องถิ่นในประเทศ. เพื่อมีแค่ค่าใช้จ่ายเกี่ยวกับอัตราค่าโทรศัพท์เท่านั้น. อย่างไรก็ตามวิธีนี้เกี่ยวข้องกับอัตราค่าโทรศัพท์เท่านั้นและอัตราค่าโทรศัพท์ทางไกลซึ่งอาจทำให้ค่าใช้จ่ายสูง.

พื้นที่บริการทั่วโลก
บริษัทใช้วิธีนี้เพื่อมีพื้นที่บริการทั่วโลกเพราะวิธีนี้ใช้การบริการบริการอิเล็กทรอนิกส์. ในวิธีนี้สำหรับบริษัทที่มีความต้องการมีค่าใช้จ่ายที่ต่ำ.

พื้นที่บริการในท้องถิ่น.
การติดต่อสื่อสารทั่วโลกเป็นไปได้สำหรับความต้องการติดต่อ. ในวิธีนี้สามารถติดต่อทั้งในท้องถิ่นและทั่วโลกได้ตามที่ต้องการ.

ผลลัพธ์ของการเลือกใช้อินเทอร์เน็ต

อัตราแบบ point-to-point	22.00	22
อัตราแบบ internet	73.00	73
อัตราแบบ แวน	5.00	5
		100



APPENDIX C

LIST OF INTERVIEWED FIRMS

1. Robinson Department Store Public Co., Ltd.
2. Tang Hua Seng
3. Top Supermarket Co., Ltd.



1. Robinson Department Store Public Co., Ltd.

Year company founded: 1979

Position in the organization: IT manager

Robinson, currently, has seventeen branches in Thailand eleven branches in Bangkok and six branches in main cities including Phuket, Nakoornsrihammarat, Hadyai, Chiangmai, and Ubonratchatani. Robinson runs both department stores and supermarkets. The firm has only one supplier (David Distribution) receiving electronic orders, other suppliers receive them by fax.

Out put of DB-EDI model

EDI Point-to-point 50%

EDI via Internet 20%

EDI VAN 30%

Implementation through Point-to-point.

The company developed its own system and document format to trade electronically between its affiliated stores. Due to limited trading partners, the company considered that it had ability to develop the system easily with low costs and little expense would occur on the operation. The company took only two months in system development. The new system interfaces with the existing information system. Only one personal computer was added. Only implementation problem is persuading management level and end users to realize the benefits of new method of trading.

Driving Forces

The main forces are cost reduction and strive for competitive advantages. To avoid errors and delays in ordering process and keep stock level, the company developed the system to trade electronically.

Usage

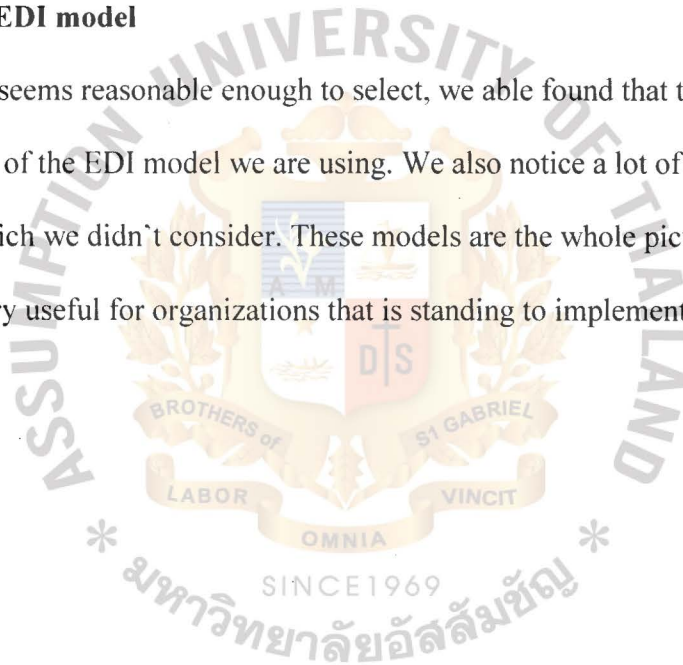
The company has been using EDI for around five years. Several business documents in proprietary format transmitted. The documents include invoice, purchase order, inventory level, and catalog list.

Usage Problems

Users had to take much time to be able to work with new process effectively and efficiently because they were unfamiliar with computer operation. Another problem comes from telephone lines since the system has to rely on a public telephone network.

Benefit from DB-EDI model

The model seems reasonable enough to select, we able found that the model increases our confident level of the EDI model we are using. We also notice a lot of hidden issue behind the selection of which we didn't consider. These models are the whole picture of EDI is Thailand and is very useful for organizations that is standing to implement EDI in their business.



2. Tang Hua Seng

Year company founded: 1962

Position in the organization: MIS manager

Out put of DB-EDI model

EDI Point-to-point	45%
EDI via Internet	20%
EDI VAN	35%

Implementation through Point-to-point.

With experience on implementing such a system before, IT staff would develop the system rather than outsource the services. It took shorter time and lower cost. Besides the system to achieve substantial cost savings and reductions in delivery times.

At first the end users had no confidence in replacing the old process with the new system. It took only a couple weeks to implement due to prior experience.

Driving Forces

To facilitate its subsidiaries and affiliated stores to effectively order goods from headquarters, the company developed the system to exchange documents electronically in order to achieve substantial costs saving and reductions in delivery times.

Usage

The company has been using EDI for less than a year. The company exchanges documents among its subsidiaries and affiliated stores using its proprietary system over telephone lines. They use their own format to transmit invoice, purchase order and inventory level.

Usage Problem

Since the system transmits data through a telephone line, the telephone of unavailable facilities sometimes occurs. Lease line is used to avoid the problem.

Benefit from DB-EDI model

The guideline of the DB-EDI model tells us that the EDI model we are using is more likely used for small organization. Ours system has to be extrapolated or change into other type of EDI to serve the organization.



3. Top Supermarket Co., Ltd.

Year company founded: 1990
Position in the organization: MIS manager

Out put of DB-EDI model

EDI Point-to-point	5%
EDI via Internet	45%
EDI VAN	45%

Implementation through EDI VAN.

Communication through VAN can ensure speed and accuracy of data. The costs are expensive, as well. During implementation stage, the company had to modify in-house software to be able to interface with the new system.

Driving Forces

EDI forces for these companies are pressures from suppliers and strategic imperative. The increasing number of suppliers using EDI made Top Supermarket to implement EDI. Moreover, the company clearly sees a lot of benefits of EDI. Other than common benefits, the company can get discount from one supplier for using EDI.

Usage

Only purchase order is transmitted to wholesalers through a VAN's services.

Usage Problem

The problem is mainly on administration of document transmission.

Benefit from DB-EDI model

From this model we will know that some choice for select EDI. Internet is also another alternative rather than VAN. But hasn't been implemented since security is still a problem verify.

APPENDIX D

EDI STANDING-BLOCKS

Table D-1 show interviewee's profile derived from interviews. In the profile, most of the organizations responding to the survey are domestic and joint venture organizations. In terms of industry, the firms are from various industry sectors. The majority is retailer. Ministry of Industry has defined the SMEs as follows by size of employment and fixed asset.

Considered of large sized from fixed asset more than 100 million baht, number of employees around more than 200 persons.

Considered of medium sized from fixed asset 20-100 million baht, number of employees around 50-200 persons.

Considered of small sized from fixed asset less than 20-100 million baht, number of employees less than 50 persons.

CHARACTERISTIC		Number of respondents
Organizational Type	- International	-
	- Joint venture	10
	- Domestic	20
	- import-export	-
Industry	- Retail	30
	- Wholesaler	-
	- Manufacturing	-
	-Transportation	-
	-Health car/Insurance	-

Number of employees	-less than 50 persons	10
	-50-200 persons	10
	-more than 200 persons	10
Fixed asset	-Less than Baht 20 million	10
	-Baht 20-100 million	10
	-more than Baht 100 million	10
Total		30

Table D-1: Interviewees' Profile



