

E-COMMERCE INITIATIVES IN THE MALAYSIAN SHIPPING INDUSTRY

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Abstract

Communication technology has always been important to a company. As this technology developed, it is increasingly being used as a strategic tool to re-engineer a business process and to gain competitive advantage. A majority of businesses and consumers have embraced electronic commerce (E-commerce) or “information exchange through an electronic means” to various extent. The electronic communications include E-mail, the internet, electronic fund transfer, electronic bulletin boards, file transfer protocols, barcodes for goods labeling and delivery, interactive voice response and electronic data interchange (EDI).

EDI is about doing business and carrying out transactions with trading partners electronically. It is a paperless trading method and therefore an important foundation block for the implementation of E-business.

To harness the capability of EDI, Malaysian ports such as Port Klang was facilitated with the national EDI, Dagang*Net under the government’s trade facilitation program. The government hopes that EDI applications will bring about greater efficiency and productivity and also be able to respond to the needs and changing requirements of the trade if a port is to become a major port of call for shipping lines the world over.

The advancement in information and communication technology (ICT) coupled with the intensification of ICT applications by all sectors prompted by the Multimedia Super Corridor (MSC) initiatives has propelled Malaysia into another level of technology exploitation – E-commerce. An understanding of their current status is essential for the success of any E-commerce initiatives in Malaysia. Thus this study seeks to provide such an empirical base.

This study found that in the Malaysian shipping industry, EDI was primarily used in transactions with the Customs Department for duty payments and import/export declaration. The results indicated that EDI usage at Port Klang might be high in terms of volume. However, its use was still very low and limited in terms of diversity, breadth and depth. There was hardly any transaction between other business partners except the Customs Department.

Although EDI has been introduced to the shipping community in the Port Klang area more than a decade ago, the port community has yet to fully realize the benefits that have been profusely talked about in literature and media. Generally, the three most cited benefits of EDI applications are the increase in efficiency, increase in data accuracy and increase in business image.

This study also revealed that hidden computing costs, connectivity problems as well as network reliability and security were the major problems faced by these companies.

1. Introduction

Communication technology has always been important to a company. As this technology developed, it is increasingly being used as a strategic tool to re-engineer a business process and to gain competitive advantage. A majority of businesses and consumers have embraced electronic commerce (E-commerce) or “information exchange through an electronic means” to various extent. The electronic communications include E-mail, the internet, electronic fund transfer, electronic bulletin boards, file transfer protocols, barcodes for goods labeling and delivery, interactive voice response and electronic data interchange (EDI).

EDI is about doing business and carrying out transactions with trading partners electronically. It is a paperless trading method and therefore an important foundation block for the implementation of E-business.

EDI was introduced to the trucking industry in the early 1970s and has since spread to other industry and business sectors. To harness the capability of EDI, Malaysian ports such as Port Klang was facilitated with the national EDI, Dagang*Net under the government’s trade facilitation program. The government hopes that EDI applications will bring about greater efficiency and productivity and also be able to respond to the needs and changing requirements of the trade if a port is to become a major port of call for shipping lines the world over.

A decade has passed since the introduction of EDI to the shipping industry in the Port Klang area. The advancement in information and communication technology (ICT) coupled with the intensification of ICT applications by all sectors prompted by MSC initiatives has prepared Malaysia to another level of technology exploitation – E-commerce. However, there has been no empirical study on the extent of EDI applications among those EDI pioneers. An understanding of their current status is essential for the success of any E-commerce initiatives in Malaysia. Thus this study seeks to provide such an empirical base.

This paper presents the findings of an empirical study on the use of EDI in the Malaysian shipping industry in the Port Klang area. The next section briefly outlines the research design, to be followed by a discussion of the current area of EDI transactions. The subsequent section describes the benefits of EDI implementation as well as problems and challenges encountered. Finally some recommendation is put forward.

2. Research Design

The purpose of this study is to empirically ascertain the extent of EDI applications among the users in the Port Klang area. The research design for this exploratory study was a cross-sectional field survey. The data was collected through mail questionnaires.

2.1 Instrument

As there was no suitable instrument available, a questionnaire had to be developed.

EDI usage can be evaluated in terms of volume of business handled; diversity, i.e. the different transactions supported; breadth, i.e. number of participating partners; and depth which refers to the level of integration with internal systems [1, 2]. In this study, we are interested to ascertain the extent to which EDI applications are implemented in different business transactions of shipping and forwarding agencies.

Interviews were conducted with the key personnel from Dagang Net Technologies Sdn. Bhd. and Dagang Net Commerce Sdn. Bhd.. Interviews also took place at a few shipping and forwarding agencies in Penang in order to understand and determine the transactions involved.

The questionnaire was then pretested with personnel from the Penang Port Commission (IT Division), relevant academics from Universiti Utara Malaysia (UUM) as well as a few other agencies in Penang.

2.2 Population and Sample

The targeted population of the study was all shippers and forwarders dealing at Port Klang. Port Klang was chosen because of its existing infrastructure supporting EDI and other E-commerce initiatives as well as being the major port in Malaysia. The targeted subjects were likely to have EDI experience.

The sampling frame of this study comprised all members of the Port Klang Shipping Agencies Association and the Association of Forwarding Agents Port Klang. As there were only a total of 343 companies, all of them were chosen as the research samples.

Survey instrument packages consisting of a cover letter, a questionnaire and a stamped reply envelope were mailed to the 343 companies in the sample. Of the number of questionnaires sent, a total of 46 were returned corresponding to a response rate of 13.4 per cent.

2.3 Respondents' Profile

A profile of the responding companies is as shown in Table 1. Slightly over 60 per cent of these companies could be classified as small with number of employees less than 50 and not having any branches (35%). About 43 per cent of these companies have been in business for more than 15 years. Even though about 85 per cent of the respondents indicated that their companies did have some form of the Internet applications, more than half of them had low internal and external connectivity. In fact, only about one fifth of the responding companies used the Internet extensively and these were the companies with more than five branches.

Table 1 Respondents' profile

	Frequency	Percent
Company		
Forwarding	26	56.5
Shipping	11	23.9
Both	6	13
Others	3	6.5
Size		
< 50	28	60.9
50 - 149	11	23.9
150	7	15.2
Branch		
1	16	34.7
2 - 5	17	37.0
5	9	19.6
Missing	4	8.7
Years in Business		
5	8	17.4
6 - 10	8	17.4
11 - 15	9	19.6
16	20	43.5
Missing	1	2.2
Internet Application		
Internal connectivity		
None	7	15.2
Low	24	52.2
High	15	32.6
External connectivity		
None	12	26.1
Low	25	54.3
High	9	19.6

3. Findings

3.1 Extent of EDI Usage

Table 2 shows that majority of the responding companies were EDI users. Of these EDI using companies, about 56 per cent of them classified themselves as environmentally-forced change users (Table 3). In other words, their EDI usage was mandated by larger and dominant business partners. The low Internet applications (Table 1) also helped to explain why most of them relied on the services of third party networks or value-added networks (VANs) to fulfill their communication needs (Table 4).

Table 2 EDI Using Companies

EDI application	Frequency	Percent
Yes	44	95.7
No	2	4.3

Table 3 EDI User Category

	Frequency	Percent
Self-directed user	17	37.0
Mandated user	26	56.5
Missing	3	6.5

Table 4 EDI Implementation

	Frequency	Percent
XML (Internet)	3	6.8
VAN	32	72.7
Both	9	20.5

EDI use was determined using a twenty-seven-item scale. Each of the 27 items represents an inter-organizational transaction that can be performed using EDI technology. Even though the items were identified through interviews with various organizations from or related to the industry as well as literature review [e.g. 3], the list might not be exhaustive. An open-ended question was included. Table 5 displays all the business transactions that have had EDI in place.

Table 5 EDI Use

Transaction	Frequency	Percent
Arrival notice	11	23.9
Bill of lading	7	15.2
Booking confirmation	6	13.0
Booking request	3	6.5
Cargo report/status	7	15.2
Customer shipping notice	4	8.7
Dangerous goods declaration	16	34.8
Dangerous goods response	13	28.3
Delivery order	5	10.9
Departure report	4	8.7
Discharge list	2	4.3
Duty payment	24	52.2
Export manifest or customs declaration	26	56.5
Fund transfer	16	34.8
Import manifest or customs declaration	26	56.5
Invoice	2	4.3
Letter of appointment	3	6.5
Letter of approval (Lampiran C)	3	6.5
Loading/Packing list	5	10.9
Rates/tariff quotation	2	4.3
Receipt	4	8.7
Shipment delivery address/notice	4	8.7
Shipment scheduling	4	8.7
Shipment tracking/status	4	8.7
Shipping instruction	3	6.5
Trans-shipment manifest	13	28.3
Vessel information	11	23.9

From the above table, it is obvious that in the Malaysian shipping industry, EDI is primarily used in transactions with the Customs for duty payments and import/export declaration. This is not surprising as most of them have indicated that their EDI usage was mandated by dominant business partners (Table 3), i.e. the Customs Department via the network supported by the Dagang Net Technologies Sdn. Bhd. [3, 4]). The low Internet applications (Table 1) as

well as VANs being the major means of EDI implementation also help to explain the current limited usage of EDI at Port Klang.

Based on these results and the written comments provided by some of the respondents, it can be inferred that EDI use at Port Klang may be high in terms of volume, i.e. high concentration on the transactions with the Customs Department such as import and export manifest as well as dangerous goods declaration. However, its use was still very low and limited in terms of diversity, breadth and depth. There were hardly any transactions between other business partners except the Customs Department. The Customs Department appears to be at the center stage of the EDI scene at Port Klang. While majority of the respondents claimed to have adopted EDI, the potential of the technology for facilitating other inter-organizational transactions is yet to be exploited.

3.2 Benefits of EDI

EDI benefits were determined using a fifteen-item scale. Each of the 15 items was measured using a 5-point Likert scale anchor at 1 (None at all) and 5 (very much).

Table 6 summarizes the findings of the study. As a whole, the responding organizations did not benefit very much from EDI applications. The three most citable benefits are increased efficiency, improved data accuracy and improved business image with score slightly over “moderate”. On the other hand, the least perceived benefits are decreased required investment, increase in profits and reduced organizational size.

About 30% of the responding organizations indicated that EDI has helped to increase operation efficiency "very much". However, there were about the same number of the responding organizations indicating that they did not experience any increase in profits at all.

Table 6 Perceived Benefits of EDI Applications

Benefits	Mean	Std Deviation
1. Increased efficiency	3.68	1.08
2. Improved data accuracy	3.54	1.12
3. Improved business image	3.54	1.17
4. Improved computation ability	3.46	1.15
5. Improved information availability	3.33	1.33
6. Decreased in operating costs	3.25	1.34
7. Improved customer service	3.22	1.20
8. Improved relations with partners	3.20	1.26
9. Improved competitive position	3.09	1.42
10. Improved employee morale	2.97	1.15
11. Improved decision making	2.94	1.14
12. Decrease in information processing costs	2.78	1.35
13. Reduced organizational size	2.75	1.27
14. Increase in profit	2.33	1.17
15. Decrease in required investment	2.26	1.22

* measured using a 5-point scale

3.3 Challenges and Problems Encountered

When asked to indicate any challenges and problems faced by the responding organizations when they implemented EDI, more than 75 per cent of them cited hidden computing costs, such as hardware/software/network installation, maintenance and operations, and connectivity were two major problems (Table 7).

Table 7 Challenges and Problems of EDI Implementation

Challenge/Problem	Frequency	Percentage
Hidden computing costs	39	84.8
Connectivity problems	37	80.4
Network reliability and security	28	60.9
Organizational changes	19	41.3
Loss of management control over IS resources	10	21.7

Further analysis using the chi-square test on the challenges and problems encountered when implementing EDI found a significant differences between internal connectivity and organizational changes at the 5% significance level (Table 3-8). Organizations with high internal connectivity experienced organizational changes.

Table 8 Cross-tabulation of Internal Connectivity by Organizational Changes

Organizational changes	Internal connectivity	
	Low	High
No	16	18
Yes	1	8

Chi-square = 4.13, df = 1, p = 0.042

The chi-square exact test revealed that the two user groups are different in perceiving the problem of hidden computing costs at the 5% significant level (Table 9). Almost all of the mandated users felt that hidden computing costs were a problem when implementing EDI. However, about one third of the self-directed group did not share the view. This may be because those self-directed users had expected the cost involved and were ready with the money when they made the technological endeavor.

Table 9 Cross-tabulation of EDI User Category by Hidden Computing Costs

Hidden computing costs	EDI user category	
	Self-directed	Mandated
No	5	1
Yes	12	25

Chi-square = 5.60, df = 1, p = 0.028

4. Conclusions and Recommendations

This study found that in the Malaysian shipping industry, EDI was primarily used in transactions with the Customs Department for duty payments and import/export declaration. The results indicated that EDI use at Port Klang might be high in terms of volume. However, its use was still very low and limited in terms of diversity, breadth and depth. There was hardly any transaction between other business partners except the Customs Department. The Customs Department appeared to be at the centre stage of the EDI scene at Port Klang. While majority of the respondents claimed to have adopted EDI, the potential of the technology for facilitating other inter-organizational transactions is yet to be realized. As a result, the benefits of EDI did not materialized.

As EDI applications were mandated by the Customs Department, applications only concentrated on major transactions between the Customs Department and its dealing partners. Most of the shippers and forwarders are not convinced of the potential benefits of EDI and organizational readiness to diversify the application to other business transactions, or to integrate with their internal systems. In addition, the low internal and external connectivity also indicated that these companies might not have the required infrastructure to support the EDI-transactions with other dealing partners.

Although much has been claimed about the success of the EDI system [5], a great deal more still needs to be done by all parties involved to increase the use of EDI in terms of breadth, diversity and depth, apart from volume. Until then, the aim of the maiden E-commerce project to embark the Malaysian shipping industry on E-commerce is yet to be achieved.

Investigation on the challenges and problems of EDI implementation revealed hidden computing costs and network related issues were the major problems faced by these companies. They felt that hidden computing costs, such as costs of hardware/software/network installation and maintenance as well as operations were too high to make this means of transaction attractive. The VAN in the Port Klang area is provided by a private organization that has pumped in a lot of money and effort to launch the project. It is not likely that the rental and charges will be brought down or subsidized unless the usage level of the VAN services can be multiplied to enable the service provider to secure some profit margin. As such, the Internet may promise to be a less costly alternative but the low connectivity among these companies is another hurdle to overcome before the breadth and diversity of EDI applications can be explored.

In Malaysia, the government, via the Customs Department, has initiated the EDI applications in the shipping industry. It is now up to the other players to pick up from here to seriously embark on E-commerce.

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