Establish Exchange Network Platform and Cargo Tracking System

Chao-Chen Hsieh and Jun-Zhi Chiu

***Abstract*—S.H. Global Logistics Co., Ltd invoiced on supply chain activities such as import and export customs clearance, FCL transport, land transport, worldwide customs clearance, express delivery, express customs clearance and distribution center. It's difficult for S.H. Co. to achieve customer requests by using current two operate systems. Additionally, there are lots of works still need manual process which result by system cannot work effectively to link the database and apply in another system. Hence, it's important to integrate the two systems in order to solve the system effectively link the database and application, increase efficiency, reduce document processing costs and response to the impact of trade facilitation. The purpose is to integrate supply chain partners own information exchange network platform and establish cargo tracking system to provide information related with status of goods and goods tracking.**

***Index Terms*—Cargo tracking system, international logistics, supply chain.**

I. Introduction

Strategic networks are long-term purposeful arrangements among organizations to get long-term sustainable competitive advantage [1]. Network organizations they created are becoming increasingly important as competitive pressures which force firms to adopt flexible and more focused organizational structures [2]. This reflects dissatisfaction with framework of networks that has recently brought to light by thinking about business strategy and has renewed interest in linking supply network in interconnected relationships [3]. Additionally, the mechanisms of supply relationship coordination must be aligned with supply network strategy to achieve operational performance benefits [4]. The purposes of this paper is to integrate supply chain partners own information exchange network platform and establish cargo tracking system to provide information related with status of goods and goods tracking.

II. Literature Review

A. Supply Network relationship

In today's world of interconnected economies, companies are no longer stand-alone organizations. Extended production network and expanded business trade caused the intensification of competition in most industries. In order to complete process, firms try to develop and sustain a relevant market positioning through an explosion of specialization around their core resources and competencies, and acquire to other organizations resources not essential to those competencies.

The increasing competitive environment made it difficult for firms to mobilize the resources that they needed to compete effectively, and the exchange leaded to relational interdependency [5]. Supply chain partnership is a collaborative relationship between a buyer and seller, even among organizations and their upstream suppliers and downstream customers which recognizes some degree of interdependence and co-operation on a specific project [6] [7]. The points are supported by Mills *et al.*, who concerned with the structure of the supply base and the links between buyer and supplier and focusing on multiple tiers suppliers extend the scope for business processes and integration efforts [8].

Additionally, companies are aware of the importance of the cooperative interorganizational relationships (IOR) in the one hand and supply chain-oriented technologies in the other hand in achieving international economic integration. In fact, designing and implementing interorganizational information systems and maintaining supply chain links play key roles in ensuring collaboration, international environment connections and business processes combination.

B. Interorganizational Information Systems (IOS)

Meier (1995) claims IOR management is a key guaranty of IOS implementation success [9]. Amami & Brimberg (2004) add the construct of cooperation with trust as leveraging factors of Web-based interorganizational information systems (IOS) use [10]. There has been a wealth of research relating in the development of the concept of supply network and their relationships. Early academic studies emphasized to explain the nature of relationship processes rather than their effect on operating or business performance. da Silveira and Cagliano examined the effect of IOS in operation performance [11]. In static network, offering a whole network perspective understand how it was formed by flow of material, services and associated information and firms' position in respect of its relationship with its supplier, channel, and buyer value chains.

III. Effective Method of IOS in Global Logistics Company

Customs being the primary guardian of our borders, they have to work closely with other government agencies. Traditionally, importers/exporters have had to apply to licensing agencies for import/export permits, certificates of

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Chao-Chen Hsieh is with the Department of Marketing and Distribution Management, Kao Fong College of Digital Contents (e-mail: chust113@hotmail.com)

inspection, certificates of quarantine, etc… These permits or certificates would then have to be submitted to the Customs along with paper-based declarations, an often complicated and frequently time-consuming process. The various stages of establishment and integration of the three major systems into the Clearance process of Taiwan Custom are as follows:

Stage 1 (The whole clearance system)

The whole clearance system not only contains Maritime customs clearance system, Air cargo clearance system and the Customs Administration System but also includes Immigration Department Information Systems and Other clearance system.

Stage 2 (Extra internet)

Extra internet provides performance tuning of database systems for query and data loading performance, including data partitioning, indexing, etc.

Stage 3 (Database query system)

Gathers and analyzes requirements for database systems, including data modeling, performance and scalability requirements, and data security, while users to ensure that the Database meets their requirements.

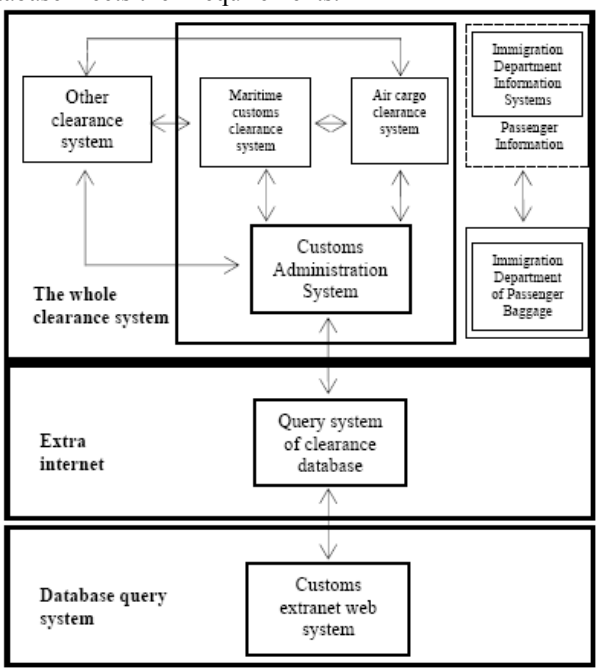

Fig. 1. Clearance process of Taiwan custom

Note:
⟷ Interaction process linkage
Passenger and cargo information

A. IOS Systems Used of Exchange Network Platform (ENP)

Customs cargo clearance automation project was promoted by the cargo clearance automation planning and promotion task force of the ministry of finance (MOF), which is now privatized and called Trade-Van information services Co. The project also included the establishment of Taiwan's first comprehensive value added Electronic Data Interchange (EDI) Network-Trade-Van to solve the communication problems encountered by the air and sea cargo communities. Trade-Van provides regular services such as electronic data interchange, data base inquiry, E-mail and packet switching. It also offers value added services such as import manifest multiple distributions, electronic duty payments, etc. After Japan and Singapore, the TAIWAN is the third country in Asia to implement full automation of cargo clearance.

Kumar & Van Dissel's classification is widely adopted to configure the use of IOS within organizations. For the reason, we are interested in the sequential interdependencies based IOS since it concerns supply chain context. S.H. Global Logistics Company adopts as the most used IOS with its supply chains partnerships EDI. Kumar & Van Dissel (1996) identified the EDI as the most used IOS to coordinate with partners [12].

The configuration is associated with more integrative systems such as the EDI application. There are two reasons why S.H. Global Logistics Company and its partnerships using EDI ; (1) it encourages firms to make investments necessary for electronic information exchange and (2) it discourages opportunistic behavior which would clearly reduce the opportunity for greater information sharing over time.

B. ENP function

The ENP aims to integrate three major existing information systems: the Customs Clearance Automation System; the Maritime Transport Net; and, the Facile Trade Net, in order to provide easier, more secure, better quality clearance services, and to reach the goal of "one submission, multiple services." The ENP function includes six functions as following (see Fig.2).

1) International Trade documentation making such as Invoice, Packing List, Letter of Credit, etc.
2) Shipper's export declaration making
3) Shipper's import and transit declarations making
4) Trade facilitation, certificates of inspection, import/export permit, quarantine, bill of lading
5) Insurance document making
6) EDI clearance process

Fig. 2. The function of ENP

C. The Advantage of ENP

In each area, the form of electronization of the commercial papers send to forwarder or customs broker has not been unified and unable to sign documents and transforms to each other directly of examine. Moreover, it causes no efficiency for materials project such us invoice, document, declaration form, shipping bill, etc. and clear customs; therefore, the current issue to be settled is how to interconnect information in every link in information and relevant networks.

Recognizing the enormous potential of paperless trading to expand business opportunities, reduce costs, increase efficiency, improve the quality of life and facilitate the greater participation of small business in global commerce. In this study, we want to build open interfaces to integrate its supply chain partners own information exchange network operating platform. When supply chain partners input data

then they can queries cargo process and tracking cargo via the ENP. The following are the advantages of the ENP

1) Reduction of business operators' time and costInformation technology systems operates as an international multi-modal logistics system, tracking details from purchase order placement through vessels, containers, orders, and items, even down to colors, sizes or individual carton bar codes.
S.H. Co.'s information technology system is fully EDI capable, utilizing state-of-the-art EDI translation technologies supporting both inbound and outbound data. Information exchange with shipping companies, airlines and freight forwarders and improve the efficiency of the overall supply chain services, and reduce the associated labor costs (see Fig. 3).

Fig. 3. Eexport /import declaration converted

2) Effective sending electronization of the commercial papersUsing EDI, one could choose transactions that provide automatic reconciliation, improve security for sensitive documents, reduce paper usage, reduce filing and reduce information errors. Exchange electronization of the commercial papers and shippers and improvement overall supply chain costs (see Fig. 4).

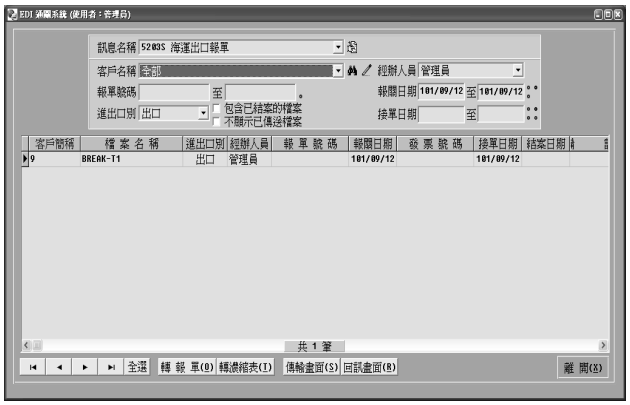

Fig. 4. EDI clearance technology usage

3) Traders enabled to instantly track down their application status. EDI VAN - enables secure, reliable, and efficient communications with trading partners around the globe. It includes services, such as Hosted Translation, that allows you to convert data into any format, EDIINT (EDIINT means stands for EDI over INTernet) Services for processing AS2 data, and the ability to process any type of data format with any trading partner regardless of their technology. International trade covers many areas, such as matching buyers and sellers, placing orders, finance and insurance (including the payment of taxes and stipulated fees), trade management (including licensing and certifying), cargo clearance, international transportation (including harbors and connecting with the international track). The integrated system is expected to save money for the private sector. Any line that uses the ENP globally will enjoy virtual real-time customer service information on its website without the need to move data from foreign, third party systems into Cargo Tracking System via EDI. Users of other liner systems can extract data from their systems and send the information to Cargo Tracking System in the EDI formats prescribed by S. H. Co.. Customers can check the status of the air cargo entrusted to S. H. Co. on the Internet. The invoice number or P/O number can be used as the search key. Through the ENP S. H. Co. also send status information by e-mail and weekly and monthly transportation reports.

4) Exception management system Setting standard operating guidelines which required set standard processing timeliness, standard operating procedures. In order to facilitate the full mastered by a computer system supervision, in violation not occurred in accordance with the normal processes in, immediately enter exception management be tracked by the system automatically notifies the processing.

IV. Conclusion

The diversity and the extent of IOS used seem to be an important driver to a better global performance. In fact, the EDI Internet-based is widely used by the companies of the logistics industry. In our study, we find companies who use ERP or the SAP systems complement the EDI by the integration between the internal and external information exchanges. For that reason all the respondents talked about the informational integration all over the supply chain as the major advantage of the IOS use. This paper has contribution to the understanding how ENP work of supply chain partners and why S.H. Co. build ENP to integrate different system under EDI Internet-based.

This study helps managers and industry analysis appreciate how firms formed a networked organization and had long-term supply relationship. More specifically, data standardization can help lower government expenditures and trading costs, as well as enhance the accuracy of the information involved. Furthermore, the use of harmonized data can ensure the consistency of reports, and facilitate data exchange and information sharing. Therefore, the ENP of S.H. Co. can serve as a platform for global interoperability and the exchange of import/export data in the future. Uses the ENP globally will enjoy virtual real-time customer service information on its website without the need to move data from foreign, third party systems into Cargo Tracking System via EDI. When the system is formally launched, it is expected

to simplify procedures and meet the goals of facilitation, transparency and a paperless clearance process.

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Chao-Chen Hsieh is a assistant professor specializes in the supply chain management and network analysis in the department of Marketing and Distribution Management, Kao Fong College of Digital Contents. Her current research areas include information technology, innovation technology and supply chain management.

Jun-Zhi Chiu is a lecturer specializes in the marketing managemen and supply chain management in the department of Marketing and Distribution Management, Kao Fong College of Digital Contents. He is also a PhD Candidate in the Graduate School of Management at the I-Shou University. His current research focuses on marketing management and knowledge management.