

# Impact on the usage of Electronic Data Interchange (EDI) on the International Shipping Business in Chennai

J.Rengamani, Fabian Andrew James, R.Srinivasan, S.Poongavanam, R.Vettriselvan

**Abstract:** The article aims to study the usage of Electronic Data Interchange (EDI) in the field of shipping and logistics sector which includes freight forwarding business, logistics sector, the movement of cargoes through sea which is typically called as sea freight, usage in customs operations, port operations and so on and so forth. The usage of EDI in various operations of shipping business has been studied through the users of the respective applications. The impact on the usage of EDI depends on the users who are involved in the process of exports and imports and also who are interested to transport the products from one point to another point. The usage of EDI has increased multifold in the current scenario since every trader would like to get things done at the quickest possible time and also by spending fewer amounts of money and with greater ease of getting things done across the systems. The applications of EDI are made available through internet and this aspect facilitates the international traders to use EDI applications more predominantly. The EDI and Electronic Commerce are always used in conjunction by the traders who expect the processing of transactions in a transparent manner. The logistical aspects can be processed at a faster pace than before through the usage of EDI which literally leads to faster access to data and information. The global usage of EDI has made the international traders to go for e-filing of documents such as bill of lading, bills of exchange, letter of credit, cargo manifests and other e-documents with fewer hassles. The impact on the usage of EDI is studied in this article through the users who are involved in shipping business in Chennai.

**Index Terms:** Electronic Data Interchange (EDI), EDI applications, e-filing, Port Users, Web Application.

## I. INTRODUCTION

The most important aspect of any international trade would be the speed of access to information especially with regard to transportation of cargoes from one place to another place, the requirement for the usage of EDI implementation would become more important since millions of dollars are involved in the transportation of cargoes which are of high value. The web based transaction of documents will

definitely have greater usage of the EDI application in the shipping business. The EDI applications would also enable faster processing of the payment gateways such as letter of credit and this will increase the speed of transferring of money from buyer to seller. The EDI applications are typically developed to reduce the difficulty of manual work which may be less precise as compared to EDI based applications. The EDI implementation and the internet connectivity will have an increase in the transformation of information from one user to another user. The shipping industry which is typically considered as a truly global industry requires more accuracy and efficiency in the processing of documents and payments. The EDI applications will also remove the redundancy of work done by the users. In the manual system, the shipping documents were traditionally prepared by using paper documentation and also forwarded in the manual manner to the destination. The format of document used in one place should match with the destination place otherwise the contents of the documents will not be deciphered by the recipient in the destination place which will definitely end up in chaos and duplication of information. On the other hand, EDI uses standardized formats for the shipping documents which will be common in both the places such as origin and destination. The companies which are involved in the transfer of cargoes and documents will be provided with electronic link which will eliminate the duplication of work. This will also enable the parties involved in trade to have an access for the future transactions also. The EDI can be used to transfer the standardized shipping documents within an organization, that is, among the departments or between the organization and the external suppliers, vendors, stakeholders and clients. The data and information which are sent from one company to another company in the secured manner by using EDI security applications are handled with utmost care and the time and money in this process are efficiently utilized.

EDI transmission involves several phases of operation that is right from the seller initiating the process till the buyer makes the payment. The seller will initiate the process of preparing the purchase order and then the seller will initiate the EDI transaction. This is followed by the seller's computer will translate the purchase order into the EDI structured format which will contain the seller's and buyer's name and identification number. The EDI format will be transmitted to the buyer as an EDI envelope. The buyer will verify the authenticity of EDI message and acknowledges the receipt of the information.

Manuscript published on 30 January 2019.

\* Correspondence Author (s)

**Dr.J.Rengamani**, AMET Business School, Academy of Maritime Education and Training -Deemed to be University, Chennai, India

**Dr.Fabian Andrew James**, AMET Business School, Academy of Maritime Education and Training -Deemed to be University, Chennai, India

**Dr.R.Srinivasan**, AMET Business School, Academy of Maritime Education and Training -Deemed to be University, Chennai, India

**Dr.S.Poongavanam**, AMET Business School, Academy of Maritime Education and Training -Deemed to be University, Chennai, India

**Dr.R.Vettriselvan**, AMET Business School, Academy of Maritime Education and Training -Deemed to be University, Chennai, India

© The Authors. Published by Blue Eyes Intelligence Engineering and Sciences Publication (BEIESP). This is an [open access](https://creativecommons.org/licenses/by-nc-nd/4.0/) article under the CC-BY-NC-ND license <https://creativecommons.org/licenses/by-nc-nd/4.0/>



The EDI message will be translated into the buyer's internal computer system. The buyer's computer will send the approval of the purchase order through EDI system and the seller will send out the products to the buyer's premises which will be received by the buyer and will send the receiving advice. The seller will then send the money remittance advice to the buyer and the money will be transferred to the seller through electronic funds transfer.

### II. REVIEW OF LITERATURE

Noor Apandi Osnin (2017) specifies in the study made with regard to EDI in Transportation elicits that the communication between people who are involved in the transportation of cargoes from one point to another point requires the data to be transferred at the quickest possible time and also without any human intervention. EDI covers transferring of data, information security, vendor participation, trader's information, distribution of data, sales data and much more. Through EDI applications, the traders and clients can exchange the information at a faster pace than the olden days. EDI will provide access to the new markets by utilizing the trading opportunities that are prevailing in that region. The major problem with regard to international trade would be the availability of proper distribution network, proper customs operations, and few others which will amount as the hurdles and these barriers can be conveniently overcome by the usage of EDI applications. The usage of EDI applications do not require years of training and with little bit of familiarization of computer jargons, one easily pick up the knowledge about EDI. The EDI application in transportation sector is considered to be the biggest advantage for the people who are involved in the trading process.

Josep Oriol (2014) indicates in the study made with regard to the Electronic Data Interchange in Port Management that the speed of the dispatching of goods will depend on the efficient way of managing and handling of documentation procedure. In order to facilitate the speedy way of managing of documentation procedure, EDI plays the major role. EDI structured messages are sent from one computer to another computer of different architectural background. It is the beauty of EDI application that the messages are sent and understood in the smooth manner without any human intervention. If documents such as bill of lading or bay plan or manifests are to be sent to the recipient then the EDI will be really handy since without any human intervention, the documents can be handled efficiently. From the ports point of view, the most important documents to be transmitted through EDI would be cargo manifest and customs declarations. The next category of documentation which are handled by EDI would be the inter communication sent and received from and by the freight forwarders, non-vessel operating common carriers, agents appointed by principal and charterers.

Hariesh Manaadiar (2010) specifies in the study undertaken with regard to EDI messages transmitted between traders who are doing business in two different countries will be based on EDI messages. In the olden days, the cargo manifests were sent through the master of the vessel and also through the post. The EDI messages can be deciphered instantaneously by both the parties avoiding

unnecessary confusions between parties, port authorities, customs officials, that is, the information regarding the cargo manifest, loading and discharging list, stowage planning, bills of entry and other relevant data. The EDI software will automatically convert the data and documents into EDI messages assisting the parties to understand the requirements of each other. The examples of EDI messages are ENTREC, DOCAMA, RETANN, etc.

Abdel-Latif, Hatem (2000) narrates in the study made on the EDI application to facilitate global freight transportation is that the EDI procedures are facilitating the traders and the customers who are involved in the international trading process of exporting and importing of cargoes of bulk nature and containerized cargoes. The cost-benefit analysis made by the author revealed the EDI usage has had a direct impact in the reduction of money spent in the handling of documents which are handled internationally. The EDI applications saved a lot of money in the waiting time of documents reach to the destination and thereby the data and information were efficiently shared between parties with less human intervention and chaos. The paperless operation could truly be achieved through EDI operation by sending the EDI messages about the port documents and customs documents well in advance to the relevant authorities and this has made a lot of time and money savings on both the parties. The major hurdle that hinders the international transaction would be the procedures followed in the respective countries and ports and EDI has simplified that process.

Roland Hellberg, Ragnvald Sannes (1991) specifies in their study of using EDI by freight forwarders that the EDI significantly improves the transaction of data especially for customs clearance and port authorities, The time taken and the cost related to the transmitting of data from the freight forwarders in Norway to the freight forwarders in the destination port has considerably reduced. This clearly shows that there is a huge amount of advantage exists in the usage of EDI applications. The EDI usage will also increase the customer base in the international trade and also it will have a smooth flow of materials and information across the borders.

### III. RESEARCH OBJECTIVES

The researcher has formulated the research objectives as given below:

- To analyze the cost and time reduction of the usage of EDI in shipping business.
- To analyze the effect of EDI applications by the international traders.

### IV. RESEARCH HYPOTHESIS

**H<sub>1</sub>:** There is a significant difference in the mean values of the EDI factors of shipping business

**H<sub>2</sub>:** There is a significant difference in the mean values of cost and time factors of EDI

V. METHODOLOGY

The research study encapsulates a model which is used in analyzing the impact of EDI usage in the shipping business in Chennai. The conceptual model is provided in Fig-1:

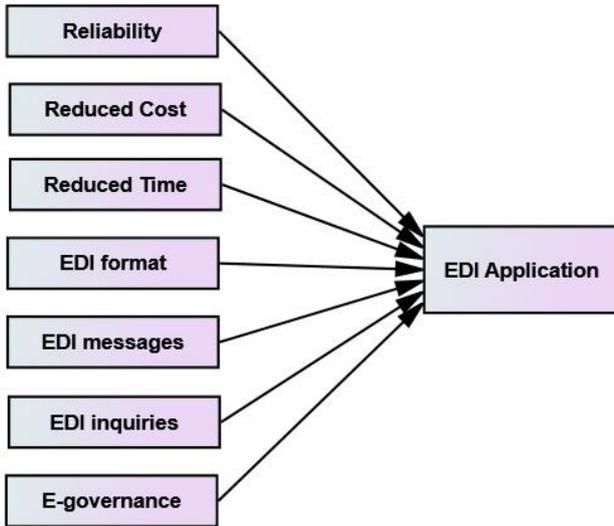


Fig-1: EDI Conceptual Model used in Shipping Business

The research study was organized by collecting data from the freight forwarders, non-vessel operating common carriers, port authorities, main line operators, port agents and customs officials. The researcher has used stratified random sampling method with the sample size of 80. The researcher has constructed a structured questionnaire to elicit information from the respondents by using likert scale from 1 (Strongly Disagree) to 5 (Strongly Agree).

VI. DATA ANALYSIS & RESULTS

The scale reliability and internal consistency of the constructs of the questionnaire was verified by using Cronbach’s alpha test measure for the factors such as reliability, reduced cost, reduced time, structured EDI format, EDI messages, EDI inquiries, E-governance and the corresponding values are 0.88, 0.82, 0.93, 0.91, 0.89, 0.91 and 0.92 respectively. The researcher has analyzed the data by using one-way analysis of variance to test the hypotheses of the study. The F score and p-values of the one-way ANOVA are given in Table-1

Table-1: One-way ANOVA of EDI factors

Factors of EDI	F-value	p-value
Data entry with regard to single terminal	2.23	0.007
Able to cater to the needs of multiple request	2.13	0.001
Ability to receive scheduled update on the status of operation	1.22	0.013
Minimizes the cost	1.23	0.021
Reliable operation	1.23	0.023
Transaction process can be monitored	1.21	0.031
Documents can be transmitted efficiently	1.32	0.013
Online payments can be made easier	1.32	0.012

Factors of EDI	F-value	p-value
Structured format of the EDI documents	1.37	0.014
Inquiry of status can be automated	2.41	0.006
Reduced time and cost	2.44	0.021
Human intervention is minimized	2.55	0.014
Enquiries are handled at a faster pace	2.35	0.015
Documents related to cargo shipments can be shared electronically	2.18	0.012
Turnaround time of shipments can be reduced	2.16	0.013
Current status can be updated through EDI messages	2.25	0.005
E-process and E-operations are made easier	3.14	0.006
Data and information are transmitted in the secured manner	1.35	0.018
Customs operations are made easier and more efficient	2.11	0.012
Regulatory authorities are connected well through EDI applications	1.14	0.003

From Table-1, it can be understood that the p-values of one-way ANOVA for all the EDI factors is less than 0.05 and hence the alternative hypotheses can be accepted. It specifies that the EDI factors such as data entry with regard to single terminal, Able to cater to the needs of multiple request, Ability to receive scheduled update on the status of operation, Minimizes the cost, Reliable operation, Transaction process can be monitored, Documents can be transmitted efficiently, Online payments can be made easier, Structured format of the EDI documents, Inquiry of status can be automated, Reduced time and cost, Human intervention is minimized, Enquiries are handled at a faster pace, Documents related to cargo shipments can be shared electronically, Turnaround time of shipments can be reduced, Current status can be updated through EDI messages, E-process and E-operations are made easier, Data and information are transmitted in the secured manner, Customs operations are made easier and more efficient, Regulatory authorities are connected well through EDI applications, are significant.

The research study clearly shows that the usage of EDI applications in the shipping business will definitely have an impact in the transmission of data and information from the source to the destination. The major advantage of using EDI applications is to minimize the cost and time of transferring the data and it greatly facilitates the international trade. Even though EDI concept is 3 decades old concept but its application in the cross-border trade is really noteworthy. Most of the traders who are intending to do business in the global manner are interested to use EDI over internet to speed up the process of transmitting the documents.

The transmission of documents will also avoid duplication of work both at the sellers point and also in the buyers point.



It is undoubtedly true that the EDI applications have changed the way the traders do business nowadays!

### VII. CONCLUSION

The core idea of the current research study is to elicit the impact of EDI usage in the shipping business. The shipping business consists of various operations right from the identification of cargo till the cargoes are delivered to the destination point. Shipping business is truly international in nature since the cargoes are delivered to a destination by crossing the national borders. In order to efficiently handle the data about the cargo and the documents, EDI will be really handy. The reason behind that are the computer systems that are used in both the countries. The computer systems and its architecture may not be unique in both the points and hence there is a requirement of the standardized EDI format. The structured EDI format will translate the data from the sellers point to the buyers point by using EDI applications. It would become very much easier for both the parties to trade internationally with less human intervention. The data securities, the amount of data to be transmitted, the e-payment mode are all taken care by EDI in the seamless manner. The speed, cost and time of transmission of data are also noteworthy. The storage and retrieval of data and information is done at lightning speed and hence it will be very much easier for any party in the chain to use the data effortlessly. It can be concluded by specifying that there is an impact in the usage of EDI in the shipping business!

### REFERENCES

- 1 Abdel-Latif, Hatem. Evaluation of EDI Application to Facilitate the International Freight Transportation in Alexandria Seaport. Civil Engineering Research Magazine, Civil Engineering Department, Faculty of Engineering, Al-Azhar University, Cairo, Egypt, 2000.
- 2 D.Rajasekar and Dr. J. Rengamani, A Study on the Infrastructural Facilities of the Seaports in Chennai Cluster. International Journal of Civil Engineering and Technology, 8(11), 2017, pp. 591–599.
- 3 EladioPeñaloza, Mary Brooks, Sunny Marche. (2007) Case study analysis of the impacts of electronic commerce on the strategic management of container shipping companies. Maritime Policy & Management 34:1, pages 37-54.
- 4 Hariesh Manaadiar, What is EDI and what is the importance of EDI in current day shipping?, Shipping and Freight Resource, , 2010.
- 5 Hyung Rim Choi, Young Sik Moon, Jae Joong Kim, Jae Kee Lee, Kang Bae Lee, Joong Jo Shin. (2018) Development of an IoT-based container tracking system for China's Belt and Road (B&R) initiative. Maritime Policy & Management 45:3, pages 388-402.
- 6 Jamie Vogel, What's the role of EDI and APIs in Logistics?, Transportation Impact, August 1, 2018
- 7 Josep Oriol, Electronic Data Interchange in Port Management; The Experience of the Port of Narcelona, FAL Bulletin-Facilitation of Trade in Latin America and the Caribbean, 2014
- 8 Logan Theissen, Using Electronic Data Interchange (EDI) in the Freight Industry, freightpros.com, MARCH 22, 2016.
- 9 Noor Apanidi Osnin, EDI in Transportation, Research gate publication, 2017
- 10 Rengamani.J, A Study On The Marine Engineers Retention Strategy by The Shipping Companies In India, International

Journal of Production Technology and Management (IJPTM), 9(2), 2018, pp. 23–30.

- 11 Rengamani.J, Impact of Goods and Services Tax (GST) on the Shipping Companies in Chennai Sector, International Journal of Mechanical Engineering and Technology, 9(8), 2018, pp. 827–835.
- 12 Roland Hellberg, Ragnvald Sannes, Customs clearance and electronic data interchange - A study of Norwegian freight forwarders using EDI, International Journal of Production Economics, Volume 24, Issues 1–2, November 1991.
- 13 Soung Won Kim, Ran Jung and MyoungSoo Kim, "Frameworks on new XML/EDI system for B2B shipping companies in Korea," Third ACIS Int'l Conference on Software Engineering Research, Management and Applications (SERA'05), Mount Pleasant, MI, USA, 2005, pp. 353-358.
- 14 Zuckerman, A. 2000. Standards, technology and the supply chain. Transportation and distribution. Cleveland. 2000.

### AUTHORS PROFILE



**Prof. Dr. J. Rengamani** working as a Professor in AMET Business School, Academy of Maritime Education and Training (AMET) Deemed to be University. He has got more than 24 years of teaching and research experience in the field of management studies. The applicant has published more than 75 research articles in scopus indexed journals, UGC approved journals and other high impact factor journals. He has authored 5 books and guiding 7 Ph.D scholars. He has presented articles in many conferences and seminars. He has received 4 awards. He was nominated as the member of Board of Management of AMET University. Presently, he is working as the Professor and Director of AMET Business School.



**Dr. Fabian Andrew James** has completed his PhD in the field of Management specializing in the area of HR and published more than 25 articles in renowned journals including scopus indexed journals. He has completed his post graduation in the field of Human Resource Management in Madras Christian College and undergraduate degree in Loyola College, Chennai. He has acquired a graduate certificate in Human Resource Management from Swinburne University, Melbourne, Australia in 2007. He has more than 9 years of corporate experience in the area of shipping and logistics as well as Human Resource Management.



**Dr. R. Srinivasan** working as a Associate Professor in AMET Business School, Academy of Maritime Education and Training (AMET) Deemed to be University. He done his Doctorate degree in AMET University. So far he has published 27 articles in Scopus indexed/UGC approved journals and other indexed journals. He participated and presented 5 papers in international conference/seminar. He got one award from reputed institution. He is member of editorial board in two international journals.



**Dr.S.Poongavanam** working as a Professor in AMET Business School, Academy of Maritime Education and Training (AMET) Deemed to be University. He done his Doctorate degree in Bharathidasan University. So far he has published nearly 127 articles in Scopus indexed/UGC approved journals and other indexed journals. He participated and

presented 25 papers in international conference/seminar. He got five awards from reputed institutions. He is member of editorial board in seven international journals.



**Dr.R.Vettriselvan**, working as a Assistant Professor in AMET Business School, Academy of Maritime Education and Training (AMET) Deemed to be University. Formerly he acted as a Head of the Department, School of Commerce and Management Studies, DMI-St. Eugene University, Zambia. He published more than 35 research articles in

SCOPUS/UGC/Referred international/ national journals and Conference volumes. He received travel grant award to USA from Population Association of America, Doctoral Fellowship from ICSSR, New Delhi. He got received best paper, best paper presenter, Best Young Faculty 2018, Bright Educator 2018 and Best Academician of the year (Male) 2018. He presented more than 50 research article in the National and International Conferences conducted in India, Zambia and USA. He is acted as a editorial board member for few international journals.