

‘A study on the Impact of EDI in Air cargo Management’

Submitted to the School of Maritime Management,

Indian Maritime University, in partial fulfilment of the requirements

for the award of degree of “Master of Business Administration” in

International Transportation and Logistics Management

By

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DECLARATION

I hereby declare that the project report titled “A STUDY ON THE IMPACT OF EDI IN AIRCARGO MANAGEMENT” submitted for partial fulfilment of the requirement for the award of the degree of Master of Business Administration of the School of Maritime Management, Indian Maritime University, Kochi Campus is a bonafide record of work done under the guidance and the supervision of Dr. SREEJITH. U School of Maritime Management in Indian Maritime University. This submission represents my ideas in my own words and where ideas or words of others have been included; I have adequately and accurately cited and referenced the original sources. I also declare that I have adhered to ethics of academic honesty and integrity and have not misrepresented or fabricated any data or idea or fact or source in my submission. This report neither in full nor in part has ever been submitted for award of any other Degree of either this university or any other university.

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CERTIFICATE

This is to certify that, this project titled “A STUDY ON IMPACT OF EDI IN AIR CARGO OPERATIONS” submitted to School of Maritime Management, Indian Maritime University, Cochin Campus by “HARISHANKAR GJ” for the partial fulfilment of the requirements for the award of the degree of MASTER OF BUSINESS ADMINISTRATION IN INTERNATIONAL TRANSPORTATION AND LOGISTICS MANAGEMENT is a bonafide record of work carried out by ‘his/her’ under my guidance.

DATE: 29/6/21

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CHAPTER -1
INTRODUCTION

Introduction

Air cargo is a trade enabler that helps to drive world economic growth and generates millions of employment. The capacity to provide high-quality goods at reasonable rates to people all around the globe is critical to the global economy. Air cargo delivers about \$6 trillion in products, responsible for approximately 35% of global trade in terms of value.

Recently, the relevance of air cargo has been recognised in the success of delivering Medicines and Drugs for COVID – 19. Vaccines can reach their target in time to be effective because of its speedier worldwide service. According to the World Health Organization, vaccination programmes save up to 3 million children's lives each year. Air cargo is important in ensuring that these temperature-sensitive medications are transported in the best possible circumstances, employing cutting-edge technology and procedures. Where one commodity that are not suitable for the conveyance of goods through sea is letters and postal parcels. Annually, 328 billion letters and 7.4 billion postal items are sent, and airmail plays an important part in their delivery. While the advent of electronic communications resulted in a significant reduction in the amount of letters written, e-commerce has resulted in an increase in the number of parcels sent on a daily basis.

Numerous difficulties in neoclassical economics have historically been ignored by assuming 'perfect information,' with perfect competition being an obvious example. As the value of information in decision making has been more generally recognised, this has progressively altered. This pattern may now be observed in transportation economics. However, including the function of information systems into traditional economic models is very far from full.

Electronic data exchange (EDI) is becoming an essential component of contemporary logistics. Economically, EDI has become crucial in monitoring, protection, and achieving effective just-in-time operational activities. As technology has evolved and its inclusion in logistics management has grown more effective, EDI has gotten more complex. This article examines a specific application of EDI in order to evaluate the organizational structure in which it functions and to investigate its present strengths and limitations in relation to economic modelling. The research focuses on the usage of EDI in the air freight industry. Air freight transportation is becoming an increasingly essential component of logistics networks involving high value/low bulk commodities and component mobility.

Meaning and Definitions

EDI, or Electronic Data Interchange, is a technology which automates business-to-business (B2B) interactions to assist business partners and organisations get more done, reduce logistical timeframes, & eliminate manual mistakes. That it is the most widely used B2B communication standard on the planet. From merchants and manufacturers to logistics businesses, airlines, healthcare providers, insurers, and more, EDI aids many organisations that create, ship, acquire, sell, or give care. The automatic, computer-to-computer transmission of standard electronic business documents between business partners via a secure, standardised link is known as electronic data interchange (EDI). Manual B2B communications, like postal mail, fax, and email, are replaced by EDI.

Documents move logically from the sender's computer (e.g. a logistics system) to the recipient's computing device (e.g., an order management system). EDI can send thousands of common business transaction records automatically. Purchase orders, bills, shipment statuses, customs details, inventory paperwork, and payment confirmations are all frequent instances. Computers handle EDI documents, which employ standard, computer-friendly forms. Each piece of data and its format are described by standards (e.g., type of document, parties involved, action to take time, date and year). Standards remove organization-to-organization differences, enabling each trade partner's computer system to communicate in the same language.

EDI papers are generally exchanged between two entities known as business partners or trade partners. For illustration, Company A may purchase products from Company B. Company A delivers Purchase Orders to Company B, which sends Company A, Invoices and Shipment Notices.

To allow the safe exchange of EDI documents, EDI employs a number of secure protocols. To exchange EDI files, partners must utilise the same, agreed-upon protocol or cooperate with an intermediate who can assist transfers if the protocols are different. Certain protocols need a greater investment in EDI technological infrastructure than others, although EDI software, such as ArcESB, now allows for exchanges with minimum expenditure. The protocols span from well-known technologies like FTP to web-based EDI via AS2, API-based systems like AS4, and additional alternatives like mobile EDI.

Using pre-configured processes, EDI messages may be transmitted automatically. Businesses generally employ EDI translators, either as software or through an EDI service provider, to

transform EDI documents for usage in internal applications, allowing for automated handling. Within an organisation, processes may be expanded to work with data integration and workflows. For instance, when a firm gets an EDI Purchase Order, the logistics system produces a task for warehouse personnel to move products from inventory to shipment.

Anyway the goal of EDI is to allow for the easy and secure sharing of data between businesses, without the use of agreements or product board structures. Furthermore, companies should be able to further process this information without needing to manually store it again. EDI is mostly used by large business firms to provide a consistent handling structure, therefore increasing production, cost efficiency, speed, precision, and efficiency. The system is costly to establish and typically necessitates the assistance of a consultant who specialises in the subject. Using EDI systems reduces the cost of publishing, recording, maintaining, sending, and retrieving paper records. The objective is to eliminate paper and have everyone use the same bill so that info can be analysed and read quickly.

Objective of the study

- To study the importance of EDI in air cargo management and air cargo logistics.
- To investigate the use of EDI in customs.
- To learn the various applications, standards and systems of EDI used in airfreight market
- To learn the work process of EDI in various occasions.
- To make recommendations regarding the study's findings.

Scope of the study

To stay up with competing forms of transportation, the air freight business may have reached a turning point when a rapid approach to digitization is necessary. Air cargo carriers' ongoing use of old technologies, as well as outdated and convoluted procedures, pose major hurdles to the industry's future. The sector has been hesitant to implement best practises and technology

advances that will modernise air freight to various degrees. Many airlines have yet to modernise their outdated systems, despite the advantages.

To understand the major influence that made by EDI in air-cargo industry, this study is an exploration on EDI and its application on airline documentation and customs. EDI has slowly achieved widespread popularity among businesses across the globe as the favoured method of exchanging files in the B2B transaction procedure over the course of decades. The advent of Internet B2B at this time, including new transport protocols like AS2, various flavours of XML-based B2B file standards, and API-based B2B integration, has mainly supplemented rather than substituted EDI. EDI has evolved and expanded into a backbone for worldwide company, much like ERP programs.

A basic set of EDI transaction types has been extensively embraced across various sectors and supply chain networks. Purchase Order, PO Remark, Advanced Ship Notice (ASN), Shipment Status, Bills, and Payments are examples of fundamental record kinds. The document set continues to increase as supply chains grow in size and breadth, with most sectors uniformly exchanging these information types with providers and some adopting new document formats.

Limitation of the Study

- Convenience sampling technique has been used. The inherent limitation of this technique may affect the study.
- The study is limited to very few air cargo complexes in India, and the sample size chosen is small as compared to the normal.
- More investment of time and money is needed to make the study useful to the public.

CHAPTER 2
LITERATURE SURVEY & METHODOLOGY

Literature review

Walton, LW studied on the subject 'EDI: a study of its usage and adoption within Marketing and Logistics Channels' in 1994. The motivation for this research is to learn what factors drive companies to embrace electronic data exchange with outer channel members namely, shippers, transporters, vendors, and consumers. Because info sent by suppliers and consumers is frequently distinct from that provided by shippers and carriers, this research examines the EDI implementation and adoption procedure in both the marketing and logistics channels. Companies are becoming more strategically oriented client driven, and technologically focused in order to compete. Organizations may achieve all of the above while lowering expenses by utilising electronic data interchange (EDI) technologies. Investing in EDI fosters long-term commitment from trade partners, improves information transmission efficiency, and helps companies to be more responsive to consumer demands via smaller demand cycles

Leslie K. et al. in 1995 investigated the process of EDI adoption and integration by US car sector suppliers in their study. Their analysis was based on information from 103 survey respondents, 81 of which had already implemented EDI and 22 of which had not. Their research shows that the factors affecting EDI appropriation are not the same as those influencing EDI coordination and victory. According to their results, managerial proactivity appears to be the most important element for EDI implementation and accomplishment. To properly implement EDI in the store network, EDI marketers must energise the administration personal creativity of low labour force carriers by completely assisting them in the course of knowing how to discover and investigate EDI gains.

In the year 2009, Fadila Kiso and Abidin Deljamin published a study on 'Airfreight and Logistics Service'. In that study they details about the changes that happened in the airline industry pertained to the air cargo and its share and traffic. They also detail about the records regarding the growth of air freight transportation in the past. Historically, the air cargo industry provided minimal services, relying heavily on many middlemen and relying

heavily on air passenger operations. The business is today considered smart and inventive, depending largely on modern electronic technology and providing a diverse variety of transit and logistics goods via specialised specialised cargo operators. With a greater concentration on globalisation of commerce and business output, aviation cargo growth is anticipated to continue to exceed increase in air passenger travel. The Asian marketplaces are anticipated to see the most increase in air cargo (intra-Asia; North America-Asia; Europe-Asia and Australasia). The method of actual cargo delivery has evolved into a highly specialized procedure, with a rising dependence on modern technologies to aid in the transit, storing, and monitoring of parcels. However, transportation is only one part of the logistics system. The air cargo industry is reviewed in this study in terms of its design organisation, position in supply chains, latest developments limitations facing the field and future possibilities in the air-freight sector. **KEY WORDS:** air freight organisation, growth, trends, forecasting, and logistics solutions.

Gerrit K. Janssens, once described regarding the EDI in logistics and e-commerce on a topic titled as 'EDI: from its new role in logistics information system' in 2011. This was mainly pertained to the adopter's expectation on EDI's vanish through the time in e-commerce and logistics sector. However, the drive in logistics toward greater integration in supply chains increased the significance of EDI. As a result of these pressures, a new form of EDI that connects with other technologies is likely. Early research on EDI promoted its usage due to cost reductions in administrative labour. However, owing to modifications in intra-corporation management models, today's savings should be sought in lesser safety stock, fewer outdated goods, and lesser premium cargo. The conventional potential of EDI decreases costs and errors, however it can offset its comparably high investment and maintenance costs, particularly for small enterprises.

In the year 2002, Paula Swatman and Graig M Parker describes about the application of EDI in Supply chain management in the topic titled as 'Traditional EDI and Supply chain management'. Under this article, they look at supply chain management techniques, starting with an outline of the supporting systems which include classic EDI as well as a variety of supplementary technologies including barcoding and e-Commerce gateway solutions. They investigated the beginnings of supply chain management, which included Just-in-Time

production, Quick Response, and Effective Customer Perception. They also looked at the e-Commerce technologies that enabled these methods, such as conventional EDI and supplementary technologies like barcode reading and e-Commerce gateway systems.

Erick Petterson (2001) air cargo industry, Sea freight business, data communication, and trade vision products and services were the four key areas studied in his thesis. According to the research, the air cargo sector has a strict standardisation and use of electronic data sharing. As a result, it has become standard for trade vision, an e-coordination organisation, to use EDI to establish electronic communication facilities for the firm and its associated meetings. Ongoing requests for similar administrations in the maritime payload market have also opened up new commercial opportunities for Trade perception. This research analyses the influx and flow situation in ocean cargo, provides an operational comparison to air cargo, and investigates how this new industry zone should be brought closer. The outcome indicated that the sector is still in an underlying stage, which is why opening doors for large portions of the pie allows the trade vision justifications to enter this region. Initially, electronic connections with transportation lines should be created through INTTRA, a group of transport lines that collaborate on EDI projects. Other modes of transportation should be added to the structure later. Booking feature should be included in the system. Delivering shipment instructions to shipping lines and presenting them to the customer. Distribution instructions are transmitted to shipping lines, and condition on sent product is presented.

In 2015, Robert Wachira Kiggira, Dr. Fred Mugambi Mwirigi and Dr. Noor Ismail shale conducted a study on 'Role of Electronic Data Interchange on Supply Chain Performance in Cargo Distribution Management in Kenya'. The study program focuses on the impact of E.D.I on supply chain performance in Kenya's freight supply chain management. In 2013, the Port of Mombasa handled 22 million tonnes of cargo, making it Kenya's most important seaport (KPA, 2014). This is more than twice the tonnage handled by Dar es Salaam Port, but just 4% of the 557.5 million tonnes managed by Singapore's port. The authorities and business market have spent substantially in the renovation and modernization of transportation infrastructure and operations in order to increase business efficiency during the previous decade. The dredging of the Mombasa Port, the finishing of Berth 19, the creation of the secondary container terminal, the expansion of the Embakasi ICD, and an emphasis on

local road linkages are just a few of the expenditures. Weighbridge privatisation and renovation, customs reform project, and the specification gauge railway line, KRA Simba 2005 System development, and the E.D.I. Regardless of these factors, there are still problems (African Universal Consulting, 2014). The report's goals are to determine the effects of E.D.I business policies, staff training, freight processing quantity, and employee environment on product distribution organization in Kenya's Mombasa Port. The study employed descriptive research methods. Because it offers feedback about the features of the phenomena, layout is important.

Regarding the revolution that took place in air cargo industry, Mr. Bo Feng, Yanzhi Li, Max Shen carried out a report named as 'Air cargo operations: Literature review and Comparison with practises' in 2015. This research examines the field on air cargo business and connects theoretical concepts to air carrier, freight forwarder, and terminal service operator concerns. They look at research that employed statistical formulas to determine key aspects of air cargo activities, like the inherent distinctions from passenger services, and to investigate the operational procedures in air freight operations. The most common models that have been utilised in prior investigations have been summarised. We then discuss the gaps between prior research and actual reality, as well as the illuminating results from an industry survey.

Ms. Rocio Cardenas has spoken about EDI, in the year on an article titled as EDI, Facilitation and importance on Trade in the year 2000, on how new management techniques are helping the business and trade, especially EDI in Just in Time techniques and Quick response technique. When the workload is increased, EDI can only be used as a tool to simplify the tasks effectively from paper works. The primary reason for the early works on international trade procedure facilitation was to decrease the load of paperwork and enable quick turnover of airplanes at airports. However, there are now additional incentives for continuing and expanding this effort, as well as a desire to do so. More dynamic approach to trade facilitation initiatives. These are seen as accelerators for the expansion of international trade. It is recognised that these impacts are far more important than simply cost savings. International commerce is dependent on economic activity, and Trade Facilitation aids in lubricating economic transactions between participating economies in order to spur economic growth. Industrial facilitation tools, such as electronic data interchange can, however, be equally

beneficial in promoting economic development inside an economy or a firm. As a result, the influence commerce efficiency should not be restricted to global trade, but should have an impact on overall financial growth

In Button, KJ and Owens, CA explanation on 'Transportation & Information systems: A case study of EDI deployment by the air cargo industry' which was published in 1999, they speak about how automation and electronic data exchange have mitigated the air cargo industry through the years. In that study they reveal, many difficulties in neoclassical economics have historically been ignored by assuming 'perfect information,' with ideal rivalry being an interesting example. As the value of information in decision making has been more generally recognised, this has progressively altered. This pattern may now be observed in transportation economics. Nevertheless, including the function of information systems into traditional business theories is far from completion. Electronic data exchange (EDI) is becoming an essential component of contemporary logistics. Economically, EDI has become crucial in monitoring, protection, and achieving effective just-in-time manufacturing processes.

Collection of Data

Data refer to information or facts. Often, researchers understand data as only numerical figures. But it also includes descriptive facts, non-numerical information, and qualitative information. In a research, if data are available, the research is half complete.

Data could be broadly classified as:

1. Primary data
2. Secondary data

Primary data is known as the data collected for the first time. Primary data are those collected by the investigator himself for the first time for a specific purpose. In this research primary data and secondary data are used. Primary data are collected using questionnaires. Questionnaire is a sheet or sheets of paper containing questions relating to certain specific aspect. The questionnaire used is a structured questionnaire. Which was prepared on Google forms

Secondary data is known as the information or facts already collected. Such data are collected with the objectives of understanding the past status of any variable. The secondary data have been collected from various journals, magazines, books and websites.

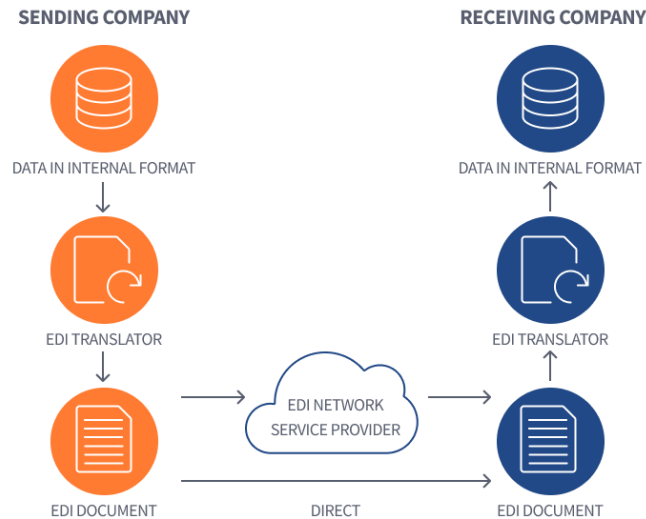
Tools and Methodologies used

- Google forms
- Form app
- Microsoft word
- Microsoft Excel

CHAPTER 3

Electronic data interchange: An overview

The computer-to-computer transmission of business information in a common electronic format between business partners is known as electronic data interchange (EDI). Companies get significant advantages by switching from a paper-based to an electronic interchange of trade documents including lower costs, faster executing fewer mistakes, and stronger connections with trade partners. Computer-to-computer Postal mail, fax, and email are all replaced by EDI. While email is an electronic method of communication, the papers that are sent over email must always be processed by humans rather than machines. Having individuals engaged slows things down data handling and increases the risk of mistakes. Instead, EDI data can be sent directly to the relevant programme on the receiver's computer (for example, the Order Management Solution), where execution can begin right once. A normal physical procedure, with plenty of paper and people involved.



Key elements of EDI system

- Hardware equipment

Hardware is a technical word that refers to a wide range of PCs as well as the actual hardware that goes with them. They are essential elements in the development of EDI exchanges, since they provide the tangible interface that enables and promotes the electronic transfer of data between at least 2 trading partners. Any combination of centralised server and close-to-home PCs can be used to build an EDI system.

- Telecommunication Network

The medium through which data may be electronically sent between the sender and receiver is provided by media transmission offices, which are made up of phone lines or other communication lines. The connection can also be established through satellite. If a media communication line cannot be connected to the receiving PC, the data can be transferred to a floppy disc or an attractive tape. The floppy disc or attractive cassette may then be manually transferred to the accepted PC for use.

If a telecommunication line to the receiving computer is not available, the data can be stored to a floppy disc or magnetic tape. After that, the floppy disc or magnetic tape can be manually transferred to the receiving computer for usage.

- Interchange software & Translation software

Messages may be sent and received between computers using interchange programming. They should have interchanges programming and interpretation programming for transmitting messages from one PC to the next. Translation programming enables communications to be encrypted and decoded into a format that both PCs can understand. The transmitting PC's programming "interprets" the message into the necessary arrangement or sequence of information elements as specified by the message standard. At the receiving PC, the product converts the standard message into a format that the receiving PC can understand and print or display in simple language.

Utilization of EDI in different sectors:

- Retail industry

For decades, the retail industry has reaped the benefits of EDI. Despite this, many businesses still utilise paper-based systems for their sales, invoicing, and shipment suggestions. This demonstrates that EDI still has a lot of room to grow in the retail industry, which hasn't gone unnoticed by many retail executives who regard EDI as critical to their companies' competitiveness. Benefit is generally based on the performance of the inventory management in the retail sector. EDI allows retailers to keep track of and replenish inventory in a more orderly manner. Shops use a standard model inventory for each store location, with the goal of offering investment opportunities that are updated on a regular basis and supported by an EDI-enabled inventory network managed by the management board. The EDI programming monitors all cooperation and performs 1st stock updates.

- Automobile Industry

Most of those business procedures utilised in the production of today's vehicles were derived from a Toyota production system in Japan. Around the 'Toyota Production System,' best practises such as Just-In-Time (JIT) and Lean Manufacturing were created. Most production lines across the world rely on JIT and Lean Production procedures to function smoothly, and EDI gives a quick and effective means to convey corporate files to assist these sorts of producing operations. Making JIT and Lean manufacturing processes successful requires visibility into inventory levels and notice of when shipments are expected to arrive at the production line. EDI is utilised in the car industry to keep consumers up to date on current product and price information throughout the buying cycle. To build up a stacking strategy and ensure proper reception of the item, an advance shipment notice is sent to the customer via EDI. To speed up the instalment process, the client can now perform an EDI instalment on receipt of items.

- Financial sector

In the financial sector, EDI substitutes the labor-intensive tasks of collecting, managing, and dispersing instalments with an electronic infrastructure. It facilitates the transfer of funds between the bank accounts of trading partners without the need for personal intervention. Electronic reserve exchange is a trade in which a payee's ledger is electronically credited and the payer's record is accordingly charged on the instalment calendar (EFT). An enterprise can use EDI to receive an invoice and make a payment electronically. By removing paper from payables and receivables flows, businesses may minimise day sales outstanding and days payables outstanding, allowing them to improve their cash conversion cycles. EDI is also a less expensive alternative to traditional paper-based payment methods, and it eliminates the mistakes that come with manual procedures.

- Healthcare sectors

It's critical for healthcare companies to keep on top of their productivity levels in the face of ever-changing legal obstacles and the strain of growing expenses. Managing healthcare payments is a time-consuming procedure that strains their administrative resources and has an impact on efficiency, regulatory adherence and cost of care. Any lapse in filing claims may result in claim denials and additional paperwork. Payers and broker dealers must employ technology to ensure that claims are processed efficiently. The electronic solution to healthcare payment issues is Electronic Data Interchange (EDI).

- Manufacturing Sector

EDI guarantees powerful and effective administration of materials required for creation of a product. In assembling area EDI encourages material prerequisite arranging and in the nick of time producing. The stock position of OEM is continually refreshed through EDI and the

provider is advised about the deficiency of materials. This causes the provider to plan and calendar supply as per prerequisites of the maker. The providers react through EDI with an ASN to recognize the parts or materials to be conveyed and the estimated conveyance time and when the shipment is conveyed at the creation plant the stock is refreshed once more. Automated transaction procedures have increased corporate efficiency. Reduced reliance on manual data entry, as well as fewer data mistakes, reduced EDI chargebacks and SLA breaches result in cost reductions, order-to-cash, procure-to-pay, and load-tender-to-invoice procedures are all expedited.

Types of EDI

Proprietary EDI

Data is exchanged with parties via direct communication channels in proprietary EDI. This direct correspondence can use a variety of encryption and differentiating proof protocols, such as AS2, OFTP2, FTPS, SFTP, and so on. When there are a few partners, the cost of coordinating the governance of restricted correspondence pathways is rather high, thus unique EDI is hardly utilised in multi-party connections. Another major consideration is that, because interaction takes place in a private realm, conversion must take place inside that same realm, posing significant availability and cost challenges.

Mail EDI (X.400, SMTP)

EDI messages can, of course, be transmitted via messages. We can see two types of connection here as well. Internet mailboxes and the SMTP standard suggestion are the more popular, but also more troublesome, means of communicating. While Internet mail is a less expensive option, in today's world of spam and anti-spam filters, its usage in automated commercial relationships is troublesome. Because EDI is fundamentally a commercial and regulatory framework, it was only natural that EDI message transmission take place within a business communication framework based on the X.400 standard. It is the type of EDI that most VANs utilise in their internal systems, placing EDI messages in an X.400

communication envelope in accordance with the X.435 standard. In certain situations, VAN relationships take place on an X.400 system as well.

EDI providers

Correspondent channels are provided by the last mentioned when EDI is set up by a professional organisation. VANs (Value Added Networks) are a subset of these specialised firms that execute EDI transmissions within their own proprietary system, typically using X.400 post boxes. Another segment is known simply as EDI providers; they provide message delivery over an open system and, in many other cases, also offer change and other administrations, such as receipt tracking. These specialised companies are closer to the EDI redistributing administration.

Mobile EDI

Movable EDI apps are an excellent example of how modern EDI can be. Requests can also be sent from mobile devices in stockrooms and malls, for example. On the basis of transfer notices, arriving items can be discharged (for example ASNs). EDI data may be accessed through mobile apps and systems, just as it can on other platforms, providing an extraordinary level of movable flexibility for reporting on the board related to goods handling.

Web EDI

This is the one referred to as WEB EDI or WEB EDI administration - there is also an EDI converter "behind" the WEB that converts messages that use various EDI standards into web shows in a comprehensible arrangement - in most cases into electronic structures. At first glance, this type of WEB ED looks tempting, as it provides a simple and cost-effective solution to the problem of EDI conversion, and avoids the need to integrate the partner into a separate business the board structure. It is a decent choice for suppliers with lower turnover and no minor business administration systems, however it can only provide a temporary answer in terms of administration as sales rise.

EDI Standards

The usage of EDI standard languages is undoubtedly the key to building EDI systems, the primary rationale explaining its adoption and penetration rate in business. The implementation of standard norms to generate electronic documents that can be understood by any trade partner with the appropriate technology has been and continues to be a decisive element in ensuring IT system integration among companies involved in commercial relationships in some form.

There are several sorts of EDI standards, some of which were designed particularly for certain businesses and others which are widely used across multiple companies or locations. Purchase requests, dispatch advice messages, bills, and other records to be exchanged must have been created according to the EDI language's standards. These rules define the sequence in which data is presented the minimum data that must be included in each message or document, the process for labelling the various elements in a document, and so on.

- **UN/EDIFACT**

Electronic Data Interchange for Administration, Commerce, and Transportation was established in 1987. It is the internationally recognised electronic data interchange (EDI) standard. EDIFACT disseminated information structure standards, intuitive trade conventions (I-EDI), standard messages (report exchange sets) for multi-nation and industry commerce, and information component catalogues. Norms for the electronic transmission of structured data between PC frameworks. At least one Interchange is included in an EDIFACT transmission. At least one Message, which contains information pieces identifying the commercial exchange, is included in each Interchange. A succession of comprehensive information sets tracks the commerce structure at each dimension. EDIFACT is used to manage inventory network exchanges between global exchanging partners. Trades include anything from purchase inquiries and inquiries to delivery and various coordinating exchanges.

- **EANCOM**

EANCOM is an electronic data interchange (EDI) standard for integrating data provided electronically with the tangible development of items. It's a subset of the UN/EDIFACT EDI standard that only comprises messages used in enterprise applications and eliminates several of EDIFACT's discretionary messages. It was founded in 1987, was taken over by GS1 in 2015, and was updated by GS1 again in 2016. It's designed for commercial and consumer items, as well as community services and development. EANCOM combines GS1 physical ID models for exchange items, co - ordination units, and Global Location Numbers (GLNs) to differentiate exchanging partners in electronic communications.

- **EDIG@S**

EDIG@S, also known as EDIGAS, is a set of EDI message transactions created specifically for the exchange of B2B documents between gas companies. EDIGAS, which began as an independent transactional standard developed by four gas companies, today has 14 member businesses that control its use, all of which are global gas and energy corporations. EDIGAS now enables XML transactions in addition to a subset of conventional EDIFACT transactions. It was developed in 1983 for the gas and energy industry, and it was refined and updated in 1996 to use UN/EDIFACT standard transactions.

- **HL7**

Health Level Seven, or HL7, is a set of worldwide standards for sharing clinical and managerial data across human care providers' programming applications. The application layer, or "layer 7" in the International Organization for Standards (ISO) concept of institutionalisation, lies at the heart of these approaches. Medical establishments and other social insurance providers frequently use a variety of PC frameworks for anything from billing records to patient tracking. When they acquire, or need to get, new data, HL7 helps all of these frameworks communicate, or interact. HL7 establishes a set of flexible norms, rules, and procedures that social insurance frameworks may use to communicate with one another,

share data, and process information in a consistent and consistent manner. This information exchange has aided in making therapeutic thought less geographically disjointed and varied. HL7. Health Level Seven, or HL7, is a collection of worldwide standards for exchanging clinical and administrative data amongst healthcare software systems. These standards are concerned with the application layer, which is referred to as "layer 7" in the ISO standardisation paradigm. Hospitals and other healthcare organisations usually employ a number of different computer systems for everything from billing to patient tracking. When these systems get, or need to receive, new information, HL7 enables them interact, or interface. HL7 defines a set of adaptable standards, rules, and procedures that healthcare organisations may use to interact with one another, share information, and process data in a consistent and standardised manner. Medical treatment has become less regionally separated and varied as a result of this information interchange.

- **HIPAA**

The Health Insurance Portability and Accountability Act (HIPAA), enacted in 1996 in the United States, mandates the usage of EDI in a common HIPAA format by millions of healthcare institutions that electronically communicate data. HIPAA EDI is a collection of data communication guidelines that regulate how to send sensitive information from one computer to another electronically. It specifies the specific structure for each transaction record and describes the various sorts of covered transactions. Its goal is to consolidate the hundreds of different medical data formats now in use into a single, widely adopted healthcare data standard. Consistency increases the simplicity and availability of health-related data while lowering management costs associated with dealing with a previously inconvenient operation.

- **NCPDP SCRIPT**

The National Council for Prescription Drug Programs established and maintains this guideline (NCPDP). Reports for electronic transmission of pharmaceutical formulations in

the United States are defined under this standard. The SCRIPT standard provides data exchanges between medication prescribers, pharmacy shops, mediators, and payers with common EDI report configurations. It's designed for human services, medicines, long-term care, medical insurance, and government. The NCPDP was founded in 1976, and in 1996, it became an ANSI-certified organisation. The NCPDP Script's notable introduction in 2010 boosted administrative recognition, and the content standard is maintained and renewed on a regular basis by the NCPDP.

- **SAP IDoc**

SAP IDocs (middle of the road reports) are institutionalised archives, or data keepers, that may communicate with SAP and non-SAP frameworks and exchange data. They resemble EDI records and are often used to electronically transmit data like as purchase orders, inquiries, and shipment notes, to name a few examples. IDocs are based on two EDI standards: X12 and EDIFACT. There is no official mapping of IDocs to EDIFACT or X12. In the event of a disagreement in information measure, it receives the arrangement with the longer length “â€” there is no official representation of IDocs to EDIFACT or X12. IDocs are used in a variety of organisations, primarily in the areas of financial coordination and deal exchanges.

- **ROSETTANET**

RosettaNet is a GS1 standard for electronically sharing data across businesses such as high-tech and consumer electronics, semiconductors, broadcast communications, and coordinating firms. RosettaNet is an open standard for forming a common e-business language and modifying forms amongst retail network partners on a global scale. It is determined by the XML specification. RosettaNet provides a wide range of budgeting and coordinating interactions, including buy orders, shipment tracking, invoices, return requests, and statements, among other things.

- **X12**

The American National Gauges Institute (ANSI) established the Accredited Standards Panel X12 (ASC X12) in 1979 as a gauges association. X12 encompasses a large number of gauges and comparison messages that are common in today's explicit business archives used by a wide range of businesses. RSSBus is a member of the ASC X12 team. X12 is a standout amongst the most widely used EDI informing standards, and it is used in a wide range of companies for a variety of purposes. Other EDI gauges, which use its settings to create industry-specific subsets, are also based on it. Fund is prominently used by a fraction of the businesses that use X12. The executives, creating, retailing, shipping, and so on, are all connected by a synchronization and stock network.

- **TRADACOMS**

TRADACOMS is a pioneering EDI standard for the retail industry. Despite the fact that EDIFACT has mostly superseded it internationally, it is still widely used in the UK retail sector. It was one of the forerunners of the UN/EDIFACT standard, and it has subsequently been adopted for the EDIFACT EANCOM subsets. Despite this, TRADACOMS is still used in the majority of UK-specific retail scenarios. It was created in 1982 as an implementation of the UN/GTDI language, an early variant of EDIFACT, and development was halted in 1995 for EDIFACT.

- **SEF**

The Standard Exchange Format (SEF) is an open-standard document architecture that specifies how unique and standard EDI documents should be organised and used. SEF is widely used by a variety of businesses for their specific EDI informing needs, as well as in collaboration and supply chains in general. SEF can be used for an EDI exchange since it is used by undertakings and ventures to create unique, bespoke EDI messages. It also supports a

variety of X12 and UN/EDIFACT standard communications, including collaboration, transportation, and money-related messages such as purchase requests, invoicing, and more.

EDI Transmission

There are numerous phases to EDI transmission. Consider a commercial transaction between a buyer and a seller.

- The EDI transaction is started by the buyer.
- The buyer's computer system converts the purchase order into the proper EDI format, known as a transaction set.
- The buyer must provide the framework with information such as the seller's name and a recognised proof number.
- The buyer sends the EDI packet to the vendor.
- The seller receives the data and checks the transaction settings.
- The seller sends a functional acknowledgement of receipt of the information.
- The seller enters the order into its own system.
- The goods is sent out by the seller.
- The buyer receives the items and provides a receipt notice.
- The seller receives a remittance advice.
- The buyer sends the money to the seller by electronic funds transfer.

EDI in Transportation

Shippers, carriers, and brokers all want to coordinate and share data as quickly as possible given the conditions, therefore EDI has become a need in the transportation industry. EDI maintains the capacity to trade bill of ladings, shipping manifests, shipment status, invoicing,

and settlements with a large number of transactions. The fundamental goal of EDI is to reduce manual chores, reduce expenses, and eliminate human error. The following are some instances of EDI codes used in transportation:

- 204 (Carrier Load Tender) – utilised by 3PLs or shippers to make a full truckload carrier a bid for a shipment.
- 211 (Bill of Lading) - an electronic bill of lading that contains information such as the shipper, shipping date, recipient, reference numbers, and delivery components.
- 212 (Delivery Trailer Manifest) - enables carriers to transmit the contents of a trailer to receivers.
- 214 (Shipment Status Message) - include current shipment location, shipper info, dates, recipient information, packing list, and delivery detail in this message.

EDI in AIRPORTS

- **AIDX**

AIDX is a worldwide XML communication standard for transferring flight data between airlines, airports, and any third party consuming operational data. AIDX is typically utilised throughout a flight's operating window, although some implementations have expanded AIDX messaging much beyond this time frame.

- IATA Recommended Practice 1797A has endorsed AIDX as a standard.
- IATA Recommended Practice 30.201A ACI Recommended Practice 501A07
- ACI Recommended Practice 501A07

The AIDX Working Group creates and maintains the AIDX messaging standard to facilitate the seamless and effective sharing of operational flight data throughout the aviation sector.

Implementation of these industry data standards provides significant advantages to all participants

Airlines, airports, IT service companies, vendors, and industry groups make up the Group. Members may work in areas of operations, design IT solutions, or be in charge of preserving Data Standards inside their businesses.

Benefits

Adoption of the AIDX industry standard provides significant benefits to airlines, operational partners in charge of updating operational flight information, and industry stakeholders that consume operational flight data:

- Data quality and accuracy have been improved.
- Assistance with A-CDM installations
- Support for use scenarios involving disruptive events
- Integration with programmes that offer an AIDX interface now has greater flexibility and a cheaper cost.
- With a common AIDX interface, you may manage/modernize a portfolio of operational apps with more agility.
- Reduced/simplified number of IT adaptors required for e-data sharing with business partners
- Utilization of open source XML tools for processing and analysing operational data

- **IATA PADIS**

IATA Passenger and Airport Data Interchange Standards (IATA PADIS) are EDI messages that may be used with both EDIFACT and XML grammars. It was clearly stated by IATA as an established mechanism for sharing traveller data between aeroplanes, air terminals, governments, and others in the aviation industry. It is far clear than the more comprehensive IATA Cargo-IMP and Cargo XML standards. IATA PADIS provides all regular traveller collaboration, such as flight registration refreshes, voucher reprints, stuff swaps, schedule valuing requests, and ticketing management requirements.

EDI messages used in IATA PADIS with descriptions:

APSINQ	Application/Product Status Inquiry
APSRES	Application/Product Status Response
ASQSRM	Airport Resource Management Query/Flight Report
ASRSRM	Airport Resource Management Response
CLTREQ	Clear/Terminate Request
CLTRES	Clear/Terminate Response
CONTRL	Syntax and Service Report
CURREQ	Currency Information Request
CURRES	Currency Information Response
DBQBRM	Baggage Reconciliation
DBQBSM	Baggage Sortation
DBQBTM	Baggage Transfer
DBQPUM	Baggage Process and Unload
DCQBPR	Boarding Pass Reprint Request
DCQCKF	Flight Check-In Update Request

DCQCKI	Through Check-In Request
DCQCKU	Through Check-In Update Request
DCQCKX	Through Check-In Cancel Request
DCQFMI	Flight Management Query
DCQLCI	Local Check-In Request
DCQPLF	Passenger List Function Request
DCQRCM	Passenger Re-accommodation Query
DCQSMF	Seat Map Function Request
DCRCKA	Through Check-In Response
DCRFMI	Flight Management Response
DCRLCI	Local Check-In Response
DCRSMF	Seat Map Function Response
DWQDLI	Deadload Information
DWRDLI	Deadload Response
EBIREQ	Excess Baggage Information Request
EBIRES	Excess Baggage Information Response
FARREQ	Fares Display Request
FARRES	Fares Display Response
FLIREQ	Flight Information Request
FLIRES	Flight Information Response
FTAREQ	Frequent Traveller Account Information/Enrolment Request
FTARES	Frequent Traveller Account Information/Enrolment Response
FTVREQ	Frequent Traveller Verification Request
FTVRES	Frequent Traveller Verification Response

HSFREQ	Hybrid Screen Format/Print Material Request
HSFRES	Hybrid Screen Format/Print Material Response
HWPREQ	Hybrid Wrap-Up Request
HWPRES	Hybrid Wrap-Up Response
INVOIC	Invoice
ITAREQ	Inventory Adjustment Request
ITARES	Inventory Adjustment Response
ITPREQ	Itinerary Pricing Request
ITPRES	Itinerary Pricing Response
NMEREQ	Passenger Name Update Request
NMERES	Passenger Name Update Response
PAOREQ	Product Availability Offering Request
PAORES	Product Availability Offering Response
PAXLST	Passenger List
PNREXC	PNR Data Exchange
PNRREQ	PNR Data Request
QUEREQ	Queue Request
QUERES	Queue Response
SBPREQ	Advance Seat Assignment and Boarding Pass Request
SBPRES	Advance Seat Assignment and Boarding Pass Response
SMPREQ	Seat Map Request
SMPRES	Seat Map Response
SPORES	Specific Product Offering Response
SQCACK	Selective Query Control Acknowledgment

SQCADV	Selective Query Control Advice
SSRREQ	Special Services Request
SSRRES	Special Services Response
TKCREQ	Ticketing Control Request
TKCRES	Ticketing Control Response
TKCUAC	Ticketing Unsolicited Airport Control Request
TKTREQ	Ticketing Request
TKTRES	Ticketing Response
TNLRES	Traveller Name List Response
WRPREQ	Wrap-Up Request
WRPRES	Wrap-Up Response

- **IATA Cargo – IMP**

IATA Cargo-IMP is an acronym that stands for International Air Transport Association Load Interchange Message Procedures. It is an EDI standard based on EDIFACT designed to computerise and institutionalise data exchange between aircrafts and other groups. The IATA Payload IMP is the legacy standard for exchanging basic cargo assignment data. In any event, IATA discontinued Cargo-IMP support with the 34th update in 2014. This was done to entirely focus on growing Freight Extensible Mark-up Language (Cargo-XML), another cutting-edge informative team. Payload XML promotes freight business forms, meets custom requirements for Advanced Cargo Information (ACI) recording, and adheres to security rules such as e-CSD. This new configuration finally allows the air payload sector to improve its operations by digitalizing the whole inventory network. Regardless of the absence of an upgrade from IATA, Cargo-IMP is nevertheless widely used in the company for electronic informing. The transition from the legacy freight IMP configuration to Cargo-XML is underway. It was created in 1983 and improved in 1996, as well as updated to use

UN/EDIFACT standard exchanges for carriers and flights. IATA Cargo-IMP allocates systems for automating the dealing of room assignment, air waybill, aircraft show, bookkeeping, status, error, ban, customs, CASS charge, hazardous merchandise, markings, and surface transportation. IATA Payload XML is an abbreviation for International Air Transport Association Payload IATA created the IATA Cargo XML standard in 2012 to replace the IATA Payload IMP norm. In 2014, IATA released its 34th release to IATA Cargo-IMP and announced that it was the last version to the protocol, with all future updates going to IATA Cargo XML. The release of IATA Cargo XML was meant to replace the flight industry's reliance on an EDIFACT-based foundation with a more modern web-first standard.

EDI Messages used in IATA Cargo – IMP

CAC	CASS Advice of Correction
CIR	Customs Inventory Report
CSI	Customs Supplementary Information
CSN	Customs Status Notification
DCM	CASS Debit or Credit Memorandum
FAC	Airline Confirmation
FAD	Advice of Discrepancy
FAI	Freight Agent Information
FAR	Adjustment Request
FAS	Freight Agent Supplementary Information
FBL	Freight Booked List
FBR	Freight Booked List Request
FBV	Courier Baggage Voucher
FCA	Charges Correction Acknowledgement

FCB	Freight CASS Billing
FCC	Charges Correction Request
FCI	CASS Invoice
FCR	CASS Remittance
FCV	CASS Void/Cancel Air Waybill
FDA	Discrepancy Answer
FDD	Declaration for Dangerous Goods Data
FFA	AWB Space Allocation Answer
FFM	Airline Flight Manifest
FFR	AWB Space Allocation Request
FFT	Freight Transaction
FHL	Consolidation List
FMA	Message Acknowledgement
FMB	Notification of Embargo
FMC	Change of Embargo
FMR	Piece Manifest Request
FMX	Cancellation of Embargo
FNA	Error
FOA	Allotment Information Answer
FOR	Allotment Information Request
FPA	Piece Status Answer
FPM	Piece Manifest
FPR	Piece Status Request
FPU	Piece Status Update

FQA	Shipment Charge Calculation Answer
FQR	Shipment Charge Calculation Request
FRA	Supplementary Rate Information Answer
FRP	Irregularity Report
FRR	Supplementary Rate Information Request
FSA	Status Answer
FSB	Substitute Air Waybill Data
FSL	Multiple Status Update List
FSR	Status Request
FSU	Status Update
FTA	Rate Information Answer
FTR	Rate Information Request
FUA	ULD Space Allocation Answer
FUM	Unit Load Device Manifest
FUR	ULD Space Allocation Request
FVA	Schedule and Availability Information Answer
FVR	Schedule and Availability Information Request
FWB	Air Waybill Data
FWC	Air Waybill Charges Collect
FWR	Air Waybill Data Request
FXX	Cancellation
FYT	CCS Free Text
FZA	House Waybill Data Request
FZB	House Waybill Data

FZC	House Waybill Status Request
FZD	House Waybill Status Answer
FZE	House Waybill Status Update
MAM	Mail Advisory
MLD	Mail Label Data
SBA	Surface Transportation Booking Answer
SBR	Surface Transportation Booking Request
SCI	Surface Transportation Charges Information
SPA	Surface Transportation Planning Answer
SPR	Surface Transportation Planning Request
SPX	Surface Transportation Planning Cancellation
SSU	Surface Transportation Status Update
STA	General Status Answer
STM	Surface Transportation Movement
STR	General Status Request

- **IATA CARGO XML**

IATA cargo XML, also known as the New Delivery Capability is a component of IATA's larger system. Reorganizing the Business began in 2004 in order to broaden competency within avionics. It integrates improvements such as computerised passes, bar-coded tickets, and new self-administration item choices, among other matters. The IATA Cargo XML standard allows for the same options to be made available to high road departure clients as well as those who book directly through airline sites. PADIS (International Air Transport Association) IATA Passenger and Airport Data Interchange Standards (IATA PADIS) are a

subset of EDI messages that may be used with both EDIFACT and XML language formats. It was clearly stated by IATA as an institutionalised mechanism for distributing traveller details between airlines, aeroplane terminals, governments, and others involved in the aviation industry. It is far clear than the more comprehensive IATA Cargo-IMP and Cargo XML standards.

- **The e-Air Way bill**

The e-Air Waybill establishes a single standard for the automated electronic exchange of standardised freight papers between airlines, freight forwarders, and customs officials at any airport globally that uses the new e-freight service. A worldwide platform that uses EDI (Electronic Data Interchange) technology to automate the issuing of all papers involved in the interchange of data in air freight cargo operations. The IATA has recognised the EDICOM e-Air Waybill solution as a legitimate worldwide platform for connecting with airlines, forwarding agencies, and customs at any airport that has adopted the new electronic system. To assure document distribution papers are delivered to their destination using private communication networks with high security standards. EDICOMNet is a robust EDI networking platform that enables direct and secure information transmission between cargo companies, airlines, and customs officials, as well as real-time document tracking.

EDI in Customs

Custom automation and EDI are made up of three primary systems.

- a. ICES must receive and process all incoming messages automatically. At the appropriate point of the clearing procedure, ICES generates all outgoing messages automatically.
- b. MES Message Exchange Servers These computers, which are installed alongside the ICES computers in custom houses, serve as intermediary stations for incoming and outgoing communications.

- c. ICEGATE and ICENET stand for Indian Customs and Central Excise Gateway and Indian Customs and Central Excise Network, respectively. ICENET connects all 40 ICES sites, the CBEC, the Directorate of Valuation, the NIC, and the DGRI.

Customs EDI process flow

- 1) Uses the Customs Workstation System to create an import declaration (CWS).
- 2) Creates a Customs Declaration Message in EDI format from an Import Declaration (CUSDEC).
- 3) Sends an electronic customs declaration message.
- 4) Inter-commerce validates the customs declaration message and sends it to the EDI Gateway.
- 5) Validates and converts data from CUSDEC to ACOS (Automated Customs Operating System) (Informix data stream).
- 6) Sends the message to ACOS.
- 7) CUSDEC is processed, and the Inspection Process is defined using Selectivity Criteria.
- 8) Produces an Assessment Notice.
- 9) Gateway receives ACOS Data Response Message (DRM).
- 10) CUSRES is retrieved from Gateway via VAN.
- 11) Converts ACOS DRM into an EDI/EDIFACT Customs Response format (CUSRES).
- 12) CUSRES is retrieved by the user.
- 13) Converts CUSRES to a Notice of Assessment.
- 14) Import Entry and Internal Revenue Document (IEIRD)/Single Administrative Document (SAD)

ICES

The ICES was created to implement the various provisions of the Customs Act 1962, CTA, and CETA, including electronic acceptance of customs documents and electronic exchange of information in centralized/structured formats, as well as integrating customs with other agencies such as the Reserve Bank of India (RBI), Director General of Foreign Trade (DGFT), and others. Using EDI, the system was developed to exchange/transact customs clearance information electronically.

In terms of import and export consignments, the Indian Customs EDI System (ICES) is presently operating at 111 main customs stations, processing almost 98 percent of India's international commerce.

It is presently operating at 245 main customs sites, processing almost 98 percent of India's import and export consignments. ICES is a system that uses electronic data interchange to share and process customs clearance information (EDI).

Objectives of ICES:

- Respond to the demands of the industry more rapidly.
- Import/export, general manifest control, ex-bond clearance of warehoused items, commodities imported under export promotion schemes, and export promotion scheme monitoring are all examples of customs-related tasks that have been computerised.
- Reduce trade interactions with government authorities.
- To ensure uniformity in evaluation and value, provide retrieval of data from other custom sites.
- Provide a management information system for policy formulation and income generation.
- Monitoring of the situation and provide the Director General of Commercial Intelligence and Statistics with timely and accurate import/export statistics.

ICEGATE

The Indian Customs Electronic Gateway (ICEGATE) is the national site of the Central Board of Indirect Taxes and Customs (CBIC), which provides electronic filing services to traders, cargo carriers, and other trading partners. ICEGATE now has 43542 registered users who serve more than 12.5 million importers and exporters. Indian Customs provides a variety of services through this facility, including electronic filing of Bills of Entry (import goods declarations), Shipping Bills (export goods declarations), e-Payment of Customs Duty, a free web-based Standard Signer utility for agreeing all Customs Documents, the ability to file online supporting documents through e-Sanchit, and end-to-end electronic IGST Refund. Fundamentally, ICEGATE is linked to a number of partner agencies, including the RBI, banks, the DGFT, the DGCIS, the Ministry of Steel, the Directorate of Appraisal, and other government entities involved in EXIM trade, allowing for quicker Customs clearance. The Indian Customs EDI System (ICES), which is now in use at 245 Customs locations, processes all electronic documents/messages handled by the ICEGATE.

ICEGATE also offers a variety of other services to its trading partners, including a 24x7 helpdesk, e-payment of Central Excise and Service Tax, on-line registration for IPR, Document Tracking Condition at Customs EDI, online validation of DEP/DES/EPCG licences, IE code status, PAN based CHA data, IGST Reimbursement Status, and links to numerous other essential websites/information.

Industry profile

Airplanes have changed the planet forever. The mere notion of an aeroplane might inspire scepticism when they first took to the sky. Floating giant, hefty, and metal birds? The concept appeared ridiculous just over a century ago. Airplanes now allow for quick travel and the delivery of millions of goods every day. Although many of the early air flight pioneers were adventurous innovators and thrill-seekers, many businesspeople were also seeking for methods to commercialise air plane. The air cargo sector would rapidly emerge as a result of this. However, the first ever air cargo transshipment carried out between Dayton to Columbus in November 1910, moreover the consignment was a bolt of silk from a retail from Ohio. History termed it as a battle between express train and flight, and guess what happened; airplane won in the race.

Obviously, the initial consignment was much like a showpiece than just a business venture. Transportation firms quickly realised they were in possession of a powerful instrument. Fast distribution to the distant regions in the US, and later the entire world, was guaranteed by air cargo.

By value, air freight accounts for more than 35% of worldwide trade. Once it pertains to integrated passenger and freight airlines, the cargo industry accounts for 9% of total revenue, which is more than double that of the 1st class category. To facilitate such vital sector, the IATA is dedicated to enhancing industry value by promoting a secure, safe, lucrative, and long-term air freight supply chain.

IATA establishes worldwide protocols and technologies, provides financial services and business solutions, manages transformation initiatives and alliances, and conducts initiatives, activism, and awareness. Air transportation is essential for manufacturing business particularly item trade, which accounts for a large portion of cross-border commerce now. The International Air Transport Association claims an increase in goods with the application of air freight. The value of products handled by aeroplanes topped \$7.4 billion, accounting for 7.4% of global GDP. Several aspects of modern life rely on air freight. Without air

transportation, it would be impossible to move perishable commodities from one side to the other since it needs appropriate storage facilities. The pharmaceutical sector relies on air transport because of its speed and efficiency in carrying high-value, time- and thermal-sensitive cargo, notably medicines. Heat adjusted bio-pharma logistics costs USD13.4 billion globally. This is expected to increase to USD16.6 billion by the end of 2021. In today's world, flying live animals across vast distances is considered the most compassionate and efficient mode of transportation.

The majority of individuals own private digital devices which were created as part of an international supply chain connected by air. Amazon, eKart, Flipkart, Alibaba, DHL, eBay, and other e-commerce businesses rely on the rapid delivery services made available by aircraft to get such devices, among other things, to their consumers. Worldwide letter transport fell from 340 to 328 billion letters, but postal shipments increased from 6.7 to 7.4 billion.

The shipping industry continues to profit from a strong cyclical upturn in volumes, with some yield recovery. The volume of aviation freight has increased dramatically by the conclusion of 2020, reaching levels not seen since before the epidemic began. The demand for air cargo drivers connected to manufacturing and economic activities remained positive in all forms. The year 2021 began on a high note, with industry-wide freight tonne-kilometers surpassing pre-pandemic levels for the 1st time after the pandemic began. In respect of freight load factors by territory, the Asia-Pacific area outperforms, while South American countries fall short of the mark.

CHAPTER 4

The analysis is carried out by the survey results collected from Google forms from 12 respondents.

4.1 Percentage Analysis

4.1.1 Educational qualification

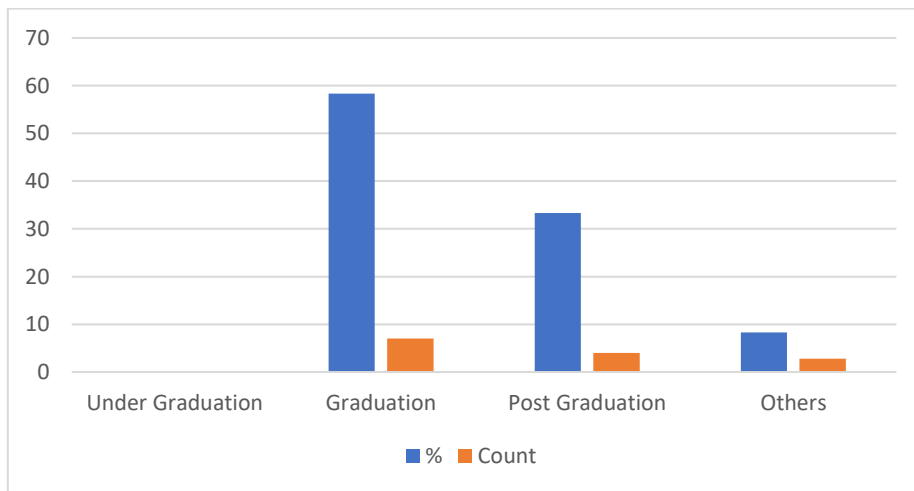
OPTIONS	PERCENTAGE	COUNT
Under Graduation	0.00	0
Graduation	58.33	7
Post-Graduation	33.33	4
Others	8.33	1

On the basis of educational qualification, respondents are classified into under-graduation, graduation, post-graduation and others. Educational wise classification of the respondents is provided in Table 4.1.1

Table 4.1.1

Chart 4.1.1

OPTIONS	PERCENTAGE	COUNT
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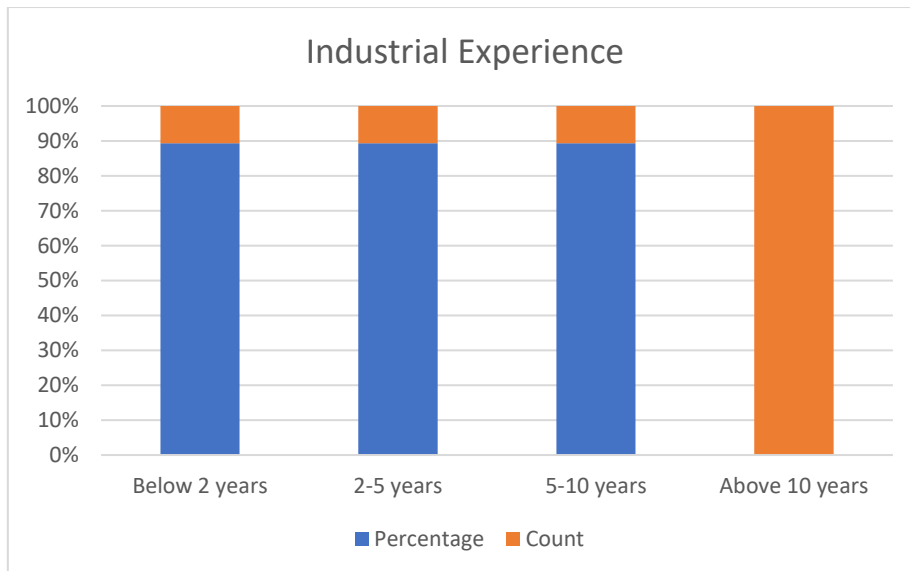
4.1.2 Industrial Experience

This results are based on the EDI users' industrial experience. The experiences are categorised into Below 2 years, 2-5 years, 5-10 years and above 10 years, the details are given in the table 4.1.2 also

Below 2 years	25.00	3
2-5 years	25.00	3
5-10 years	50.00	6
Above 10 years	0.00	0

Table 4.1.2

Chart 4.1.2



4.1.3 EDI Standard utilization in the Company

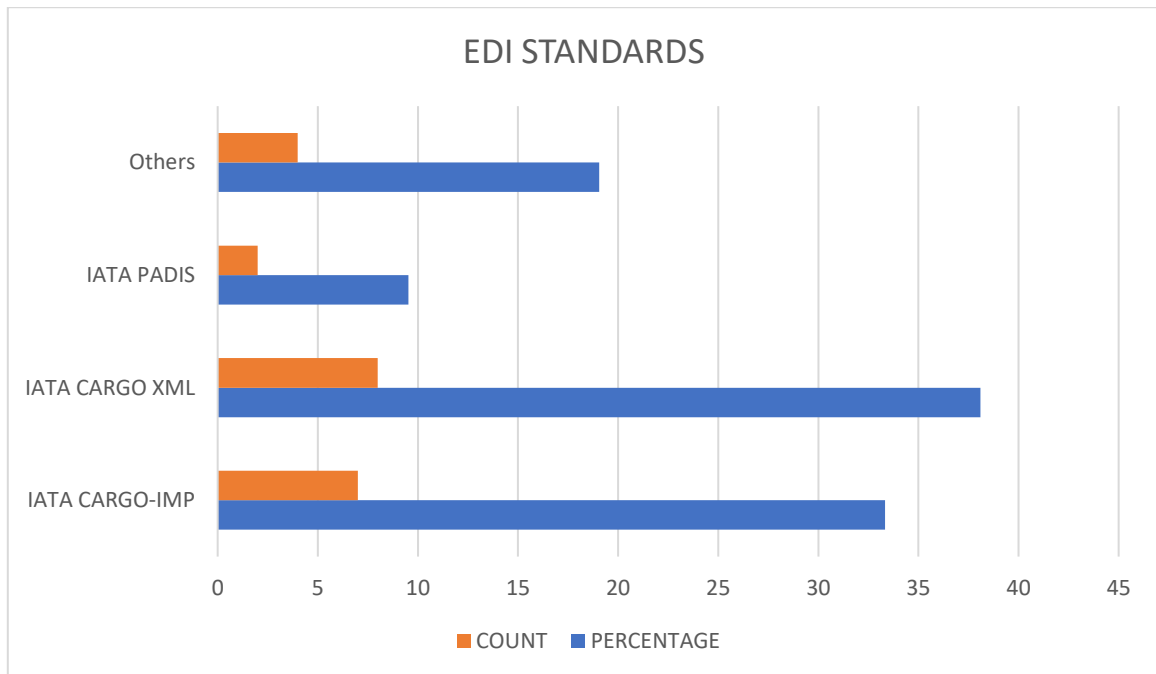
The respondents were given to choose as many options to select. The options were IATA Cargo-IMP, IATA Cargo XML, IATA PADIS and Others. The results are depicted in the chart 4.1.3

Table 4.1.3

OPTIONS	PERCENTAGE	COUNT
----------------	-------------------	--------------

IATA CARGO-IMP	33.33	7
IATA CARGO XML	38.10	8
IATA PADIS	9.52	2
Others	19.05	4

Chart 4.1.3



4.1.4 EDI- Prime feature

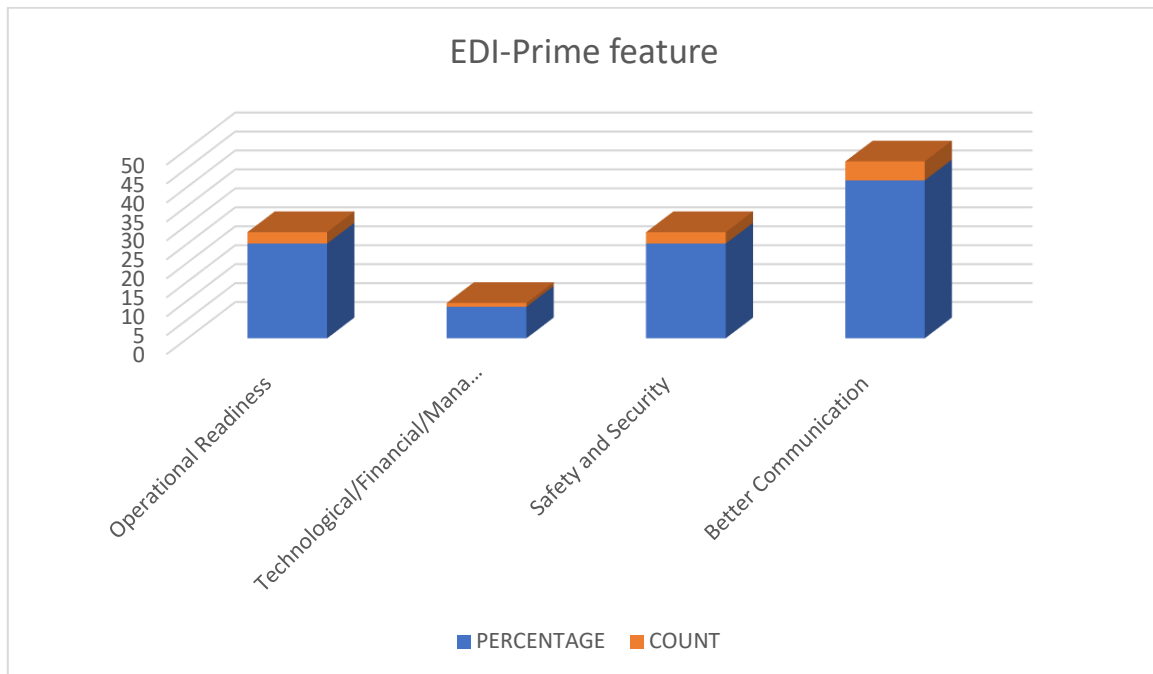
The users were asked to fill the dominant trait they observed in their EDI. The features provided were Operational readiness, Technological/Financial/Managerial benefits, Safety and Security and Better communication.

Table 4.1.4

OPTIONS	PERCENTAGE	COUNT
---------	------------	-------

Operational readiness	25.00	3
Technological/Financial/ Managerial Benefits	8.33	1
Safety and Security	25.00	3
Better Communication	41.67	5

Chart 4.1.4



4.1.5 EDI Security

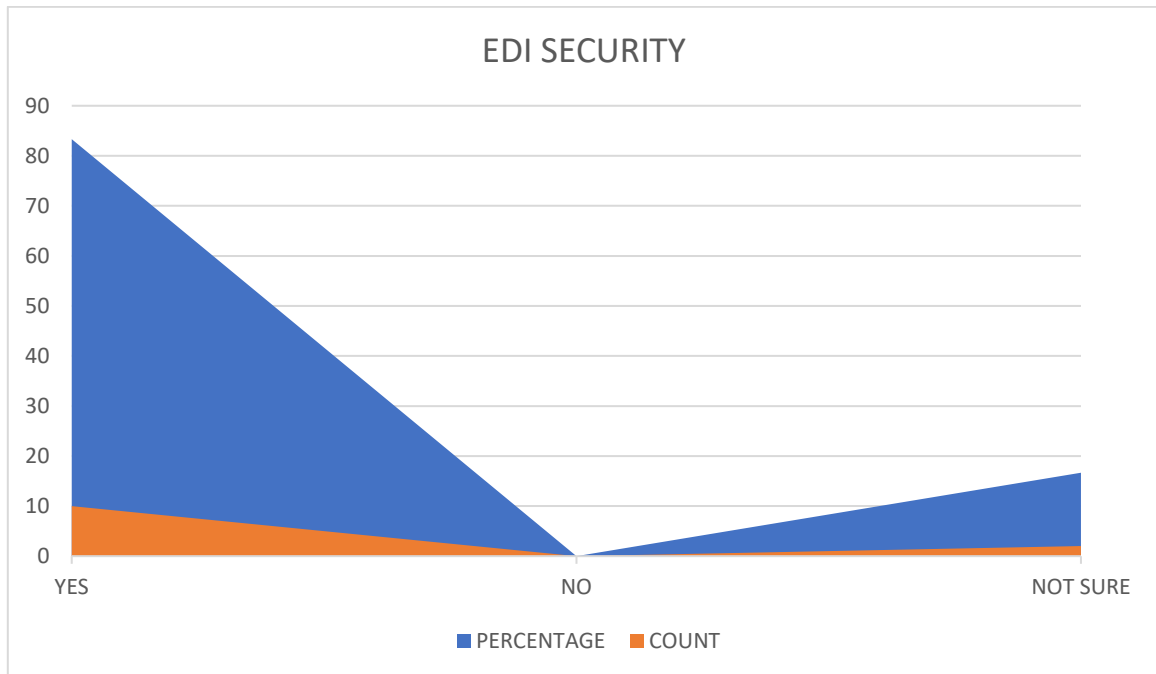
This question were asked to know how much the users trust the system in the transaction of messages and security features of EDI documents.

Table 4.1.5

OPTIONS	PERCENTAGE	COUNT
---------	------------	-------

YES	83.33	10
NO	0.00	0
NOT SURE	16.67	2

Chart 4.1.5



4.1.6 EDI File Format

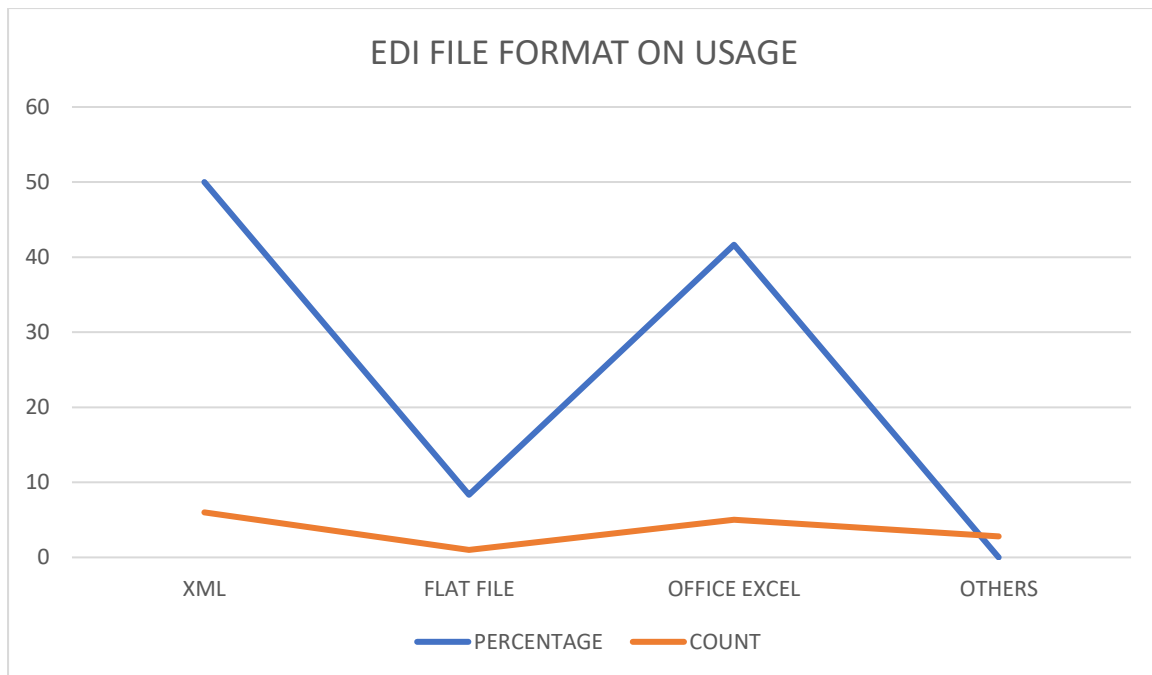
The users were asked to pick the most used EDI file format in their organization. The choices were XML, Flat file, Office Excel and Others.

Table 4.1.6

OPTIONS	PERCENTAGE	COUNT
---------	------------	-------

XML	50.00	6
FLAT FILE	8.33	1
OFFICE EXCEL	41.67	5
OTHERS	0.00	0

Chart 4.1.6



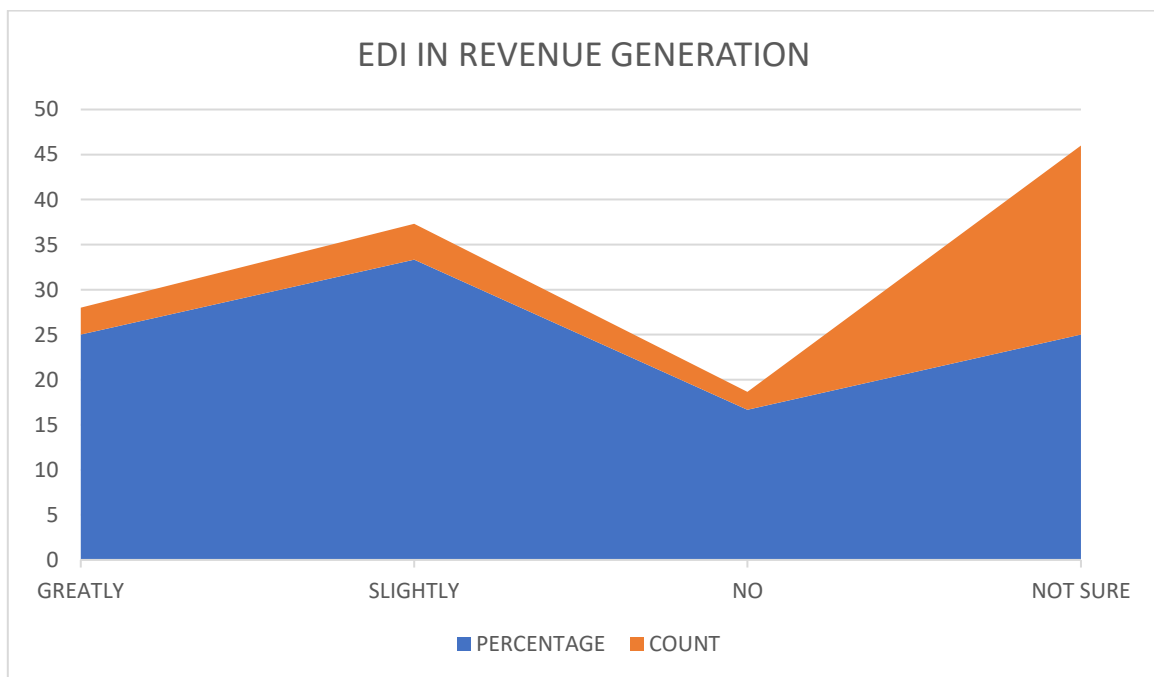
4.1.7 Role of EDI in Revenue Generation

EDI's impact on Revenue generation of a company is examined through the expertise survey. The level of acceptance were indicated as Greatly, Slightly, No and not sure

Table 4.1.7

OPTIONS	PERCENTAGE	COUNT
GREATLY	25.00	3
SLIGHTLY	33.33	4
NO	16.67	2
NOT SURE	25.00	3

Chart 4.1.7



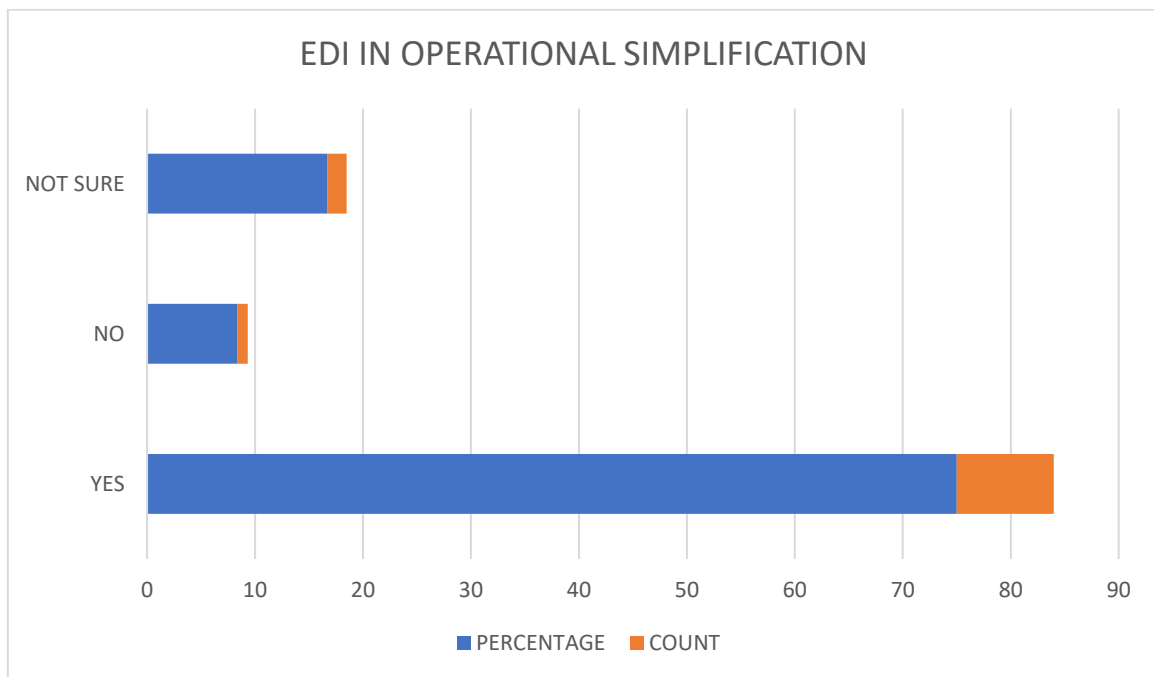
4.1.8 Role of EDI in seamless organizational operations

The employees works at the air cargo terminal were asked to rate the performance of EDI in their operations.

Table 4.1.8

OPTIONS	PERCENTAGE	COUNT
YES	75.00	9
NO	8.33	1
NOT SURE	16.67	2

Chart 4.1.8



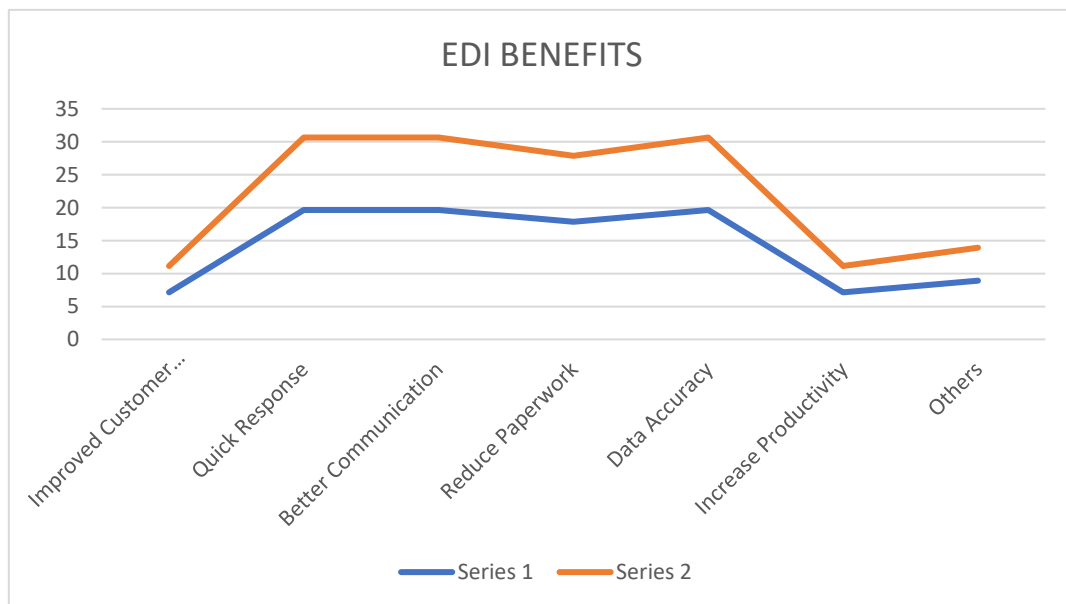
4.1.9 Benefits of EDI

The air cargo operational staffs were asked to list out the benefits they achieve through EDI systems. A group of traits were enlisted, namely, Improved Customer Service, Quick Response, Better Communication, Reduce Paperwork, Data Accuracy, Increase Productivity and Others.

Table 4.1.9

OPTIONS	PERCENTAGE	COUNT
Improved customer service	7.14	4
Quick Response	19.64	11
Better Communication	19.64	11
Reduce Paperwork	17.86	10
Data Accuracy	19.64	11
Increase Productivity	7.14	4
Others	8.93	5

Chart 4.1.9



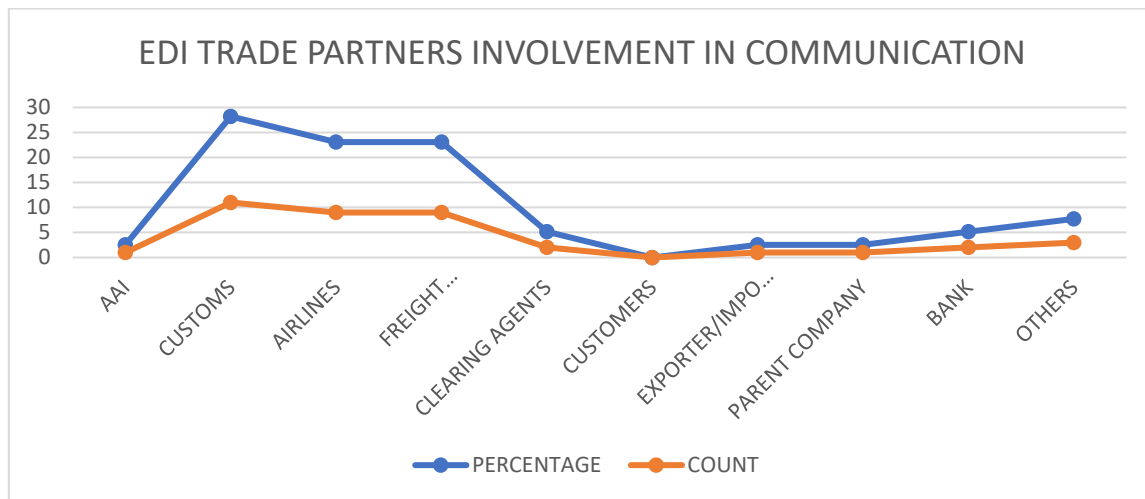
4.1.10 EDI Trade partners

To know the intensity of document flow in EDI, Respondents were asked to answer to the question, to whom with the most EDI communications are occurred, with several choices.

Table 4.1.10

OPTIONS	PERCENTAGE	COUNT
AAI	2.56	1
CUSTOMS	28.21	11
AIRLINES	23.08	9
FREIGHT FORWARDERS	23.08	9
CLEARING AGENTS	5.13	2
CUSTOMERS	0.00	0
EXPORTER/IMPORTER	2.56	1
PARENT COMPANY	2.56	1
BANK	5.13	2
OTHERS	7.69	3

Chart 4.1.10



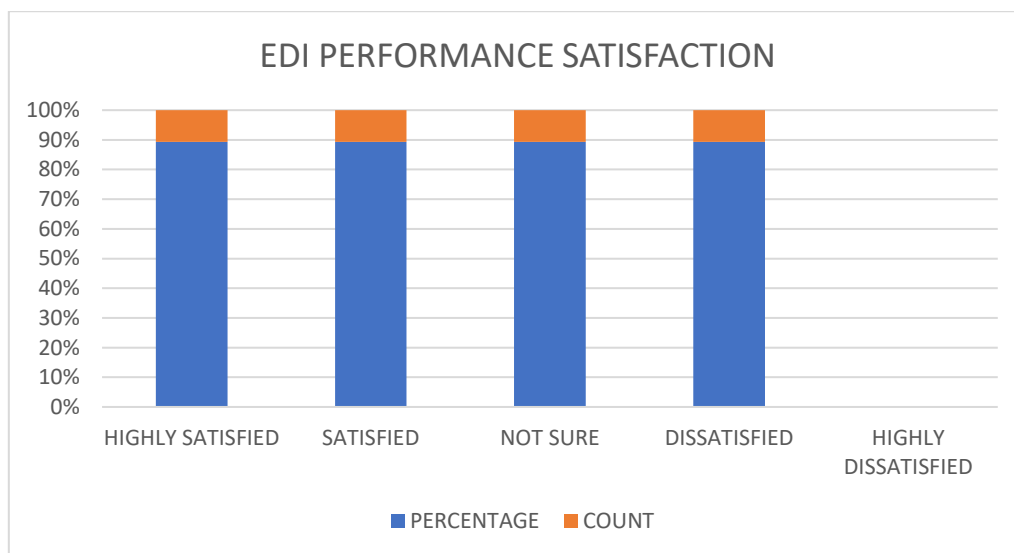
4.1.11 Satisfaction on EDI performance

The satisfactory factors were displayed as Highly satisfied, Satisfied, Not sure, Dissatisfied, and Highly dissatisfied.

Table 4.1.11

OPTIONS	PERCENTAGE	COUNT
HIGHLY SATISFIED	16.67	2
SATISFIED	50.00	6
NOT SURE	25.00	3
DISSATISFIED	8.33	1
HIGHLY DISSATISFIED	0.00	0

Chart 4.1.11



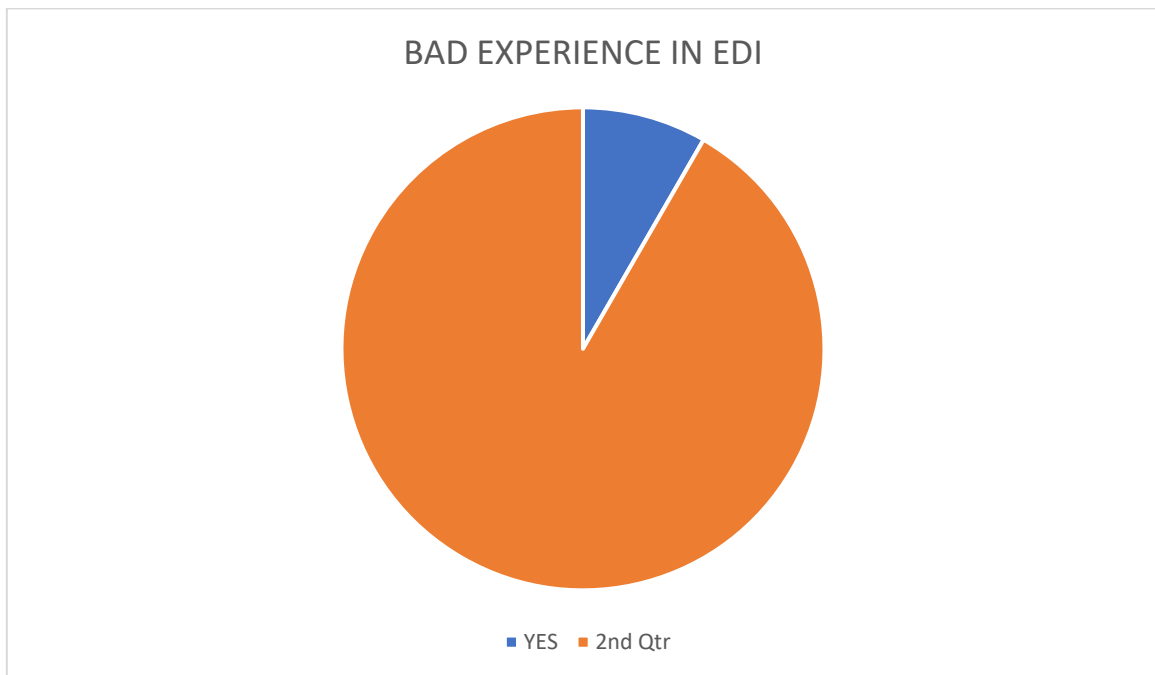
4.1.12 Bad experience with EDI

This question was regarding if the EDI has ever disappointed the employee causing operational damage to the company. If they have experienced, the reply was recorded as YES and vice versa.

Table 4.1.12

OPTIONS	PERCENTAGE	COUNT
YES	8.33	1
NO	91.67	11

Chart 4.1.12



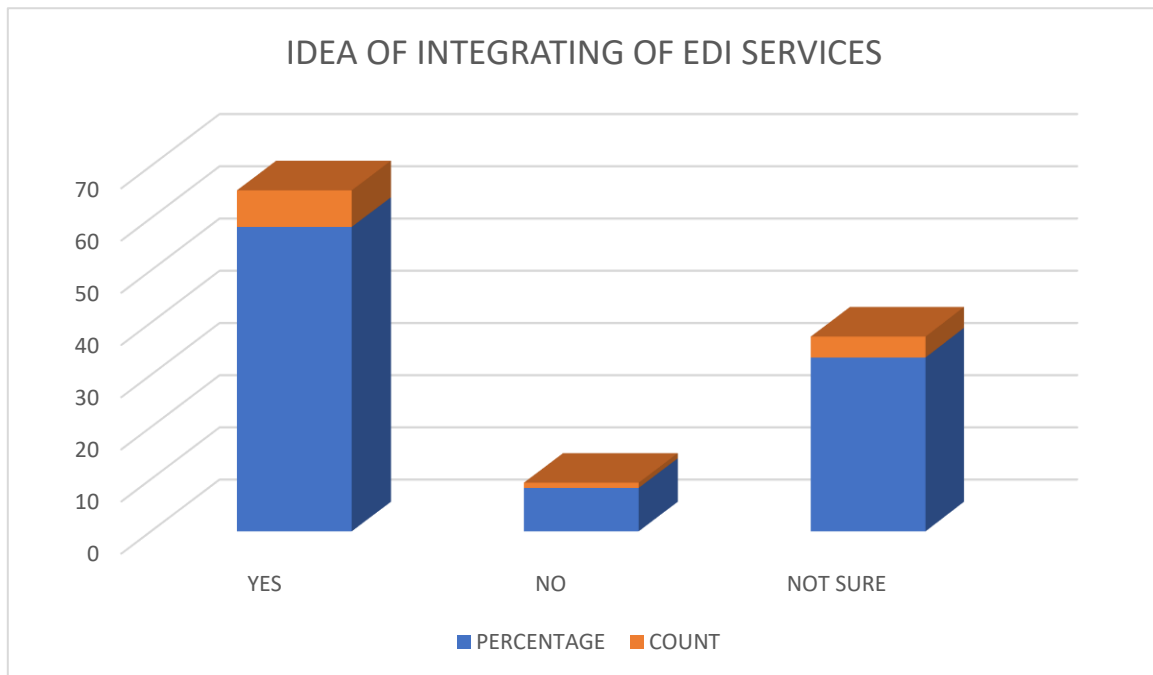
4.1.13 User's review on the idea of Integrating EDI services

This review was collected on the purpose of understanding the user’s opinion on integrating EDI with ERP and other resources in a single window.

Table 4.1.13

OPTIONS	PERCENTAGE	COUNT
YES	58.33	7
NO	8.33	1
NOT SURE	33.33	4

Chart 4.1.13



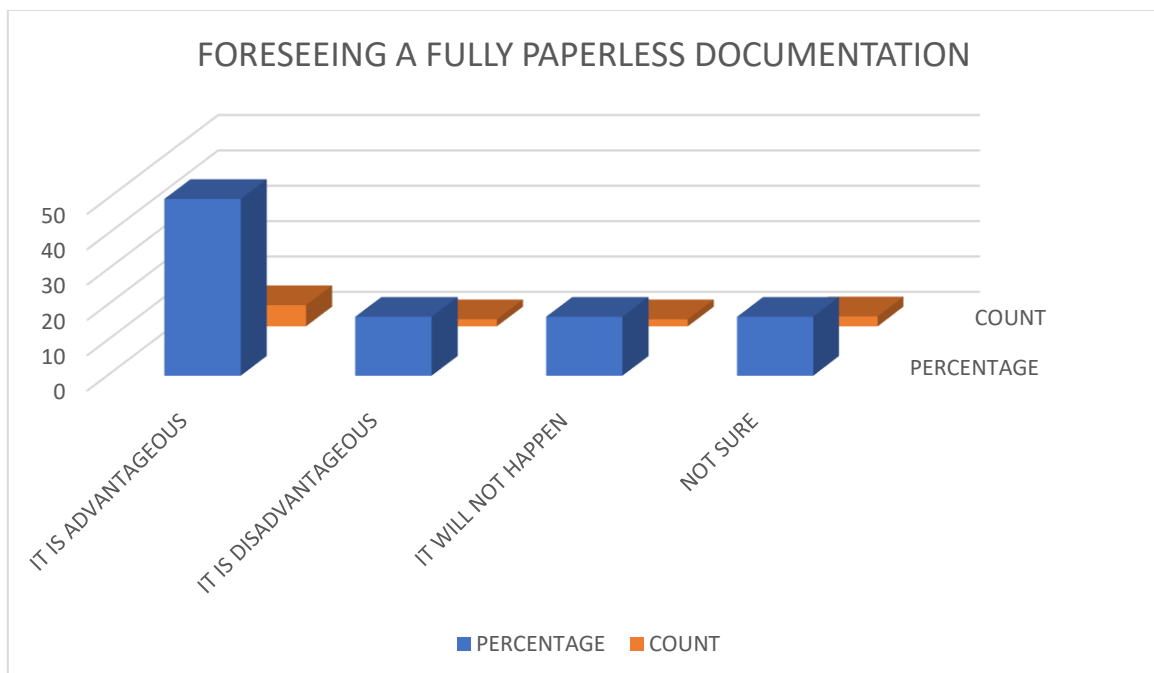
4.1.14 Foreseeing Paperless documentation in future

A question to the future of EDI, this question was asked to know how they think about a complete paperless documentation in future, which EDI has paved the way so far. Their responses were:

Table 4.1.14

OPTIONS	PERCENTAGE	COUNT
IT IS ADVANATAGEOUS	50.00	6
IT IS DISADVANTAGEOUS	16.67	2
IT WILL NOT HAPPEN	16.67	2
NOT SURE	16.67	2

Chart 4.1.14



4.2 Data interpretation

- **Data 4.1.1** represents the educational qualification of employees, who are able to operate EDI system. In this result, the majority of them are graduated (58.33%), followed by post-graduation (33.33%) and finally the others category which is unknown. No under graduated persons were recorded.

- **Data 4.1.2** explains details regarding the industrial experience of the employees. Out of 12, 6 were noted as having more than 10 years of experience. 3 people are having minimum of two years of experience. The remaining three are having below 2 years of experience.

- **Data 4.1.3**, in this information, the most used EDI standard among the sample have found out to be IATA CARGO XML with 38.10% followed by IATA CARGO-IMP (33.33%), and the remaining.

- **Data 4.1.4** gives us the information of most available feature of EDI system, better communication is noted as the best feature (41.67), followed by Readiness and Safety and Security (25%). Finally the technical benefits.

- **Data 4.1.5** provides data about the security of EDI method. For the particular question, 83.33 % respondents gave a positive feedback and the remaining vice versa.

- **Data 4.1.6**, the most used file format in document distribution is XML (50%), then Office Excel (41.67) and flat files (8.33). Hence it is understandable that, XML is the most used file in communication.

- **Data 4.1.7** was regarding the impact of EDI in Company's revenue generation. The employees have given a positive feedback to the problem asked. 33% says EDI slightly impacts on Revenue generation of the property, indeed, 25% says it has a great deal of influence in revenue generation. 25% does not have an opinion and the remaining 16.67% says no involvement in revenue making.

- **Data 4.1.8** examines how an EDI system work as a mediator in seamless operations in an entity. The 9 out of 12 response reveal, the smooth operations in an organization is a result of EDI. 16.67% people is not sure about the functioning. And one person claims it does not make big difference.

- **Data 4.1.9** was to find the benefits of EDI. Surprisingly, the results were as expected. The better communication (19.64%), Quick Response (19.64%), Data accuracy (19.64%) are still maintained in EDI services. Paperless solution (17.86) is also noted as an integral benefit, followed by other unknown benefits (8.93%) and improved customer service and increased productivity (7.14%).

- **Data 4.1.10** was a study to find the most involved trade partner in EDI transmission. In this result, Customs were found out be the most involved party in EDI communication (28.21%), then the airlines and the freight forwarders (23.08%). Others category has 7.69% result followed by Bank and Clearing agents (5.13%). The least participated components are AAI, Exporter/Importer and Parent company (2.56%).

- **Data 4.1.11** is a feedback from the EDI users with their satisfaction on EDI performance. 50% of users are satisfied and 16.67% are highly satisfied with the performance. 25% are having no comment on this question. However, a smaller portion is dissatisfied. Notably no one in highly dissatisfied.

- **Data 4.1.12**, this session was to find any dysfunctions in EDI, surprisingly 1 out of 12 replied as, he/she has met with EDI errors. The remaining have a great experience with EDI

- **Data 4.1.13**, 58% of surveyed people demands an integration in EDI with other resources to enhance the operations with new techniques and innovations, whereas 33.33% says not sure and the balance 8.33% says no.

- **Data 4.1.14**, this was a random survey question regarding the future of EDI. The question related to demand of a complete paperless documentation in the future. 50% of responses were agreeing to the comment as advantageous, whereas 16.67% says it is disadvantageous. The other 16.67% says there is no such a possible future. The remaining 16.67% says not sure about the prediction.

CHAPTER 5

5.1 Findings

- The common users of EDI are well educated to operate the accessories of the system. Most of them recorded as graduates.
- The current users of EDI are having an experience more than 5 years with EDI.
- The major understanding of study regarding EDI in Air cargo movement is that, the operations of each elements in this process has fastened with the introduction of EDI. Basically, it helped much accomplishment of effective Perishable cargo exports.
- The air cargo sector mainly use ICES and ICEGATE as a common EDI for custom procedures for a long period of time.
- From the study, the major impact made by EDI is the better communication and the operational readiness.
- EDI impacted on the security of documents. It is found that easy retrieval of documents from the cloud storage whenever required. The security feature of EDI is to be acknowledged.
- In air freight market in India the most used file formats are XML and Excel files, however, there are another interesting new formats to be explored for much efficiency transportation.
- Study revealed, EDI improved the quick response, better communication, reduced paperwork, and data accuracy in transporting goods.
- The IATA approved EDI standard connects Customs, airlines and Freight forwarders.
- The current users of EDI system are obtained as satisfied with the performance. However, a smaller portion expects more features from EDI services.
- In revenue generation, EDI never failed by making errors at an extreme level.
- In overall, a positive review is recorded on EDI's impact on airfreight conveyance.

5.2 Conclusion

Conducting the study on the application of EDI in air cargo management was to learn its application in all the areas of air freight management and various modes of EDI and to understand how the parties in an EDI system works, namely, the buyers and sellers on the basis of standards of EDI. Over the period of time EDI has impacted in air freight market as an exponential growth in quickness and readiness of data exchange. The majority of the users in air cargo market are the business partners itself. From the sellers to the buyers the core functions of EDI differs from transaction of money to documents. The users of EDI mainly inclined towards its technological, managerial, financial and numerical benefits after readiness as a trait. Except the customs departmental purposes, other users of air cargo management EDI negotiated its security features. Enhanced customs clearance and inspection procedures result in commercial transactions that are quicker, more assured, and, eventually, less expensive. Due to the reduced need to prepare, manage, store, and distribute customs documents, computerization of customs operations resulted in time and cost savings. The electronic data interchange system updates always bring new techniques that increase productivity of desired objective. Moreover, EDI makes data exchange and transactions quicker and reliable.

5.3 Suggestions

- The idea of combination of EDI with ERP, or with other processors of air cargo operations will lead to much seamless operations
- The hardware connectivity to the system :- Smartphone accessibility
- Different air cargo complexes within the country are using variant models of EDI as per their operational management. It is advised to use similar models of EDI systems providing almost similar features.
- Although, these systems can deliver the documents as a prime feature, few features are pertained to several models of EDI systems only, that acts as a barrier which is recommended for the removal
- The company should study the employee understanding about EDI system
- Systematic training for the employees periodically in an organization with the updates in the software
- For the quality of EDI performance, employ additional IT experts or technicians in the company for immediate support and scrutinize the quality control over the EDI system
- Considering the feedback from the users for implementing better performance of EDI. Different users or companies have their own priorities and requirements, since customise with their priorities and objectives

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APPENDIX

QUESTIONNAIRE

1. Educational qualification

- Under graduation

- Graduation
 - Post-graduation
 - Others
2. Industrial experience
- Below 2 years
 - 2-5 years
 - 5-10 years
 - Above 10 years
3. Which are the EDI standards being used in your organization. (You can select as many options possible).
- IATA CARGO-IMP
 - IATA CARGO XML
 - IATA PADIS
 - Others
4. In your opinion which is the prime feature of your EDI system
- Operational readiness
 - Financial/technological/managerial benefits
 - Safety and security
 - Better communication
5. In your opinion, are transactions through EDI more secure than other modes?
- Yes
 - No
 - Not sure
6. Which file format do you prefer in data communication?
- XML
 - Flat file
 - Office excel
 - Others

7. Do you agree, EDI influences in Revenue generation?
- Yes, greatly
 - Yes, slightly
 - No
 - Not sure
8. Do you support, EDI eases organizational operations?
- Yes
 - No
 - Not sure
9. The benefits attributed to electronic data interchange are: (You can choose as many options possible)
- Improved customer service
 - Quick response
 - Better communication
 - Reduce paperwork
 - Data accuracy
 - Increase productivity
 - Others
10. With whom does your organization exchange data in EDI.(You can select as many options possible)
- AAI
 - Airlines
 - Freight forwarders
 - Clearing agents
 - Customers
 - Exporter/importer
 - Parent company
 - Bank
 - Others
11. Are you satisfied with current performance of EDI.

- Highly satisfied
- Satisfied
- Not sure
- Dissatisfied
- Highly dissatisfied

12. Have you ever come across a bad experience with EDI that distressed organizational activities.

- Yes
- No

13. Do you support if all the EDI services are integrated into a single window, would increase much efficiency and productivity

- Yes
- No
- Not sure

14. Do you foresee, a complete paperless documentation in future? If so, do you find it either advantageous or disadvantageous?

- It is advantageous
- It is disadvantageous
- I don't see
- Not sure