

A COMPARATIVE STUDY OF TRADITIONAL ELECTRONIC DATA INTERCHANGE VERSUS INTERNET ELECTRONIC DATA INTERCHANGE

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Abstract

Electronic data interchange has resulted in the boosting of profit and productivity for business. Companies are able to be competitive by migrating from a paper-pencil driven society into an electronic media civilization. However, the electronic media world is looking to make another change. In this ever growing and maturing age of information, more and more people are implementing computers to communicate with one another. Now, people all over the world, have the capability of connecting to other computers anywhere on the globe. The purpose of this paper is to compare the advantages and disadvantages of the traditional electronic data interchange system versus the Internet electronic data interchange system.

Keywords: Electronic Data Interchange, ANS X.12, UN/EDIFACT, protocols, Internet EDI.

1. INTRODUCTION

Over the last ten years, Electronic Data Interchange (EDI) has impacted the way business is conducted between organizations. The long-established manual implementation of paper-pencil procedures for many of its day-to-day operations has been computerized into a paperless form of magnetic data storage and transmission. When a company mandates the purchase of goods or products from another firm, a long and tedious procedure no longer has to be carried out. EDI has changed the entire procedure into an efficient electronic operation. EDI has standardized the operation of performing day-to-day business. Also, it has been characterized as the automation of computer-to-computer exchange of structured business documents between an enterprise and its vendors, customers, or other trading partners (Data Interchange Standards Association, 1992 & Digital, 1988). The focal points of EDI have been the ability to substitute standardized business forms into electronic defined forms, and then exchange the data between the organizations.

There have been many positive results from the implementation of EDI into the business environment.

Firstly, organizations have reduced the amount of paper that is consumed. Secondly, there has been an elimination of data entry errors. Third, now, businesses have the capability of expediting the transmission of information. Finally, "just in time" processing has been facilitated.

EDI in its preconceived environment has been the exchange of data amongst organizations on a one-to-one situation. The transmission of data takes places in basic units referred to as messages or transaction sets. Each transaction record encompasses data with respect to the organization and its vendors. Then, the segments are arranged into groups, which are preceded by a header transaction record and followed by a trailer transaction record (Higgins, 1996). After all of the data has been entered and stored by the organization, then, it is transmitted to the recipient vendor. The data transmission is accomplished as a point-to-point modem communication (Curtis, 1996). In cooperation, the sender (organization) and the receiver (vendor) have their computer system's modems connected to voice

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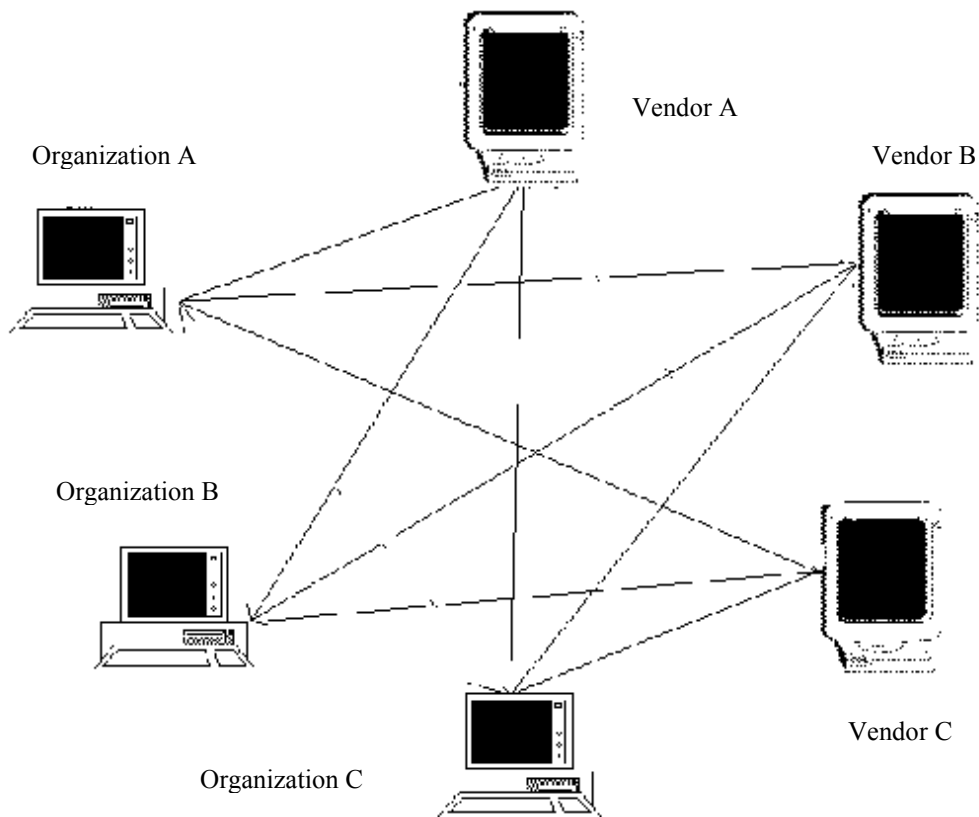


Figure 1 – Direct EDI Transmission Of Data Between Organizations And Vendors

grade lines (standard telephone wires). Data is broadcasted in the same procedure that a telephone conversation would take place between individuals. An illustration of an EDI data transfer for directly connected business partners are found in Figure 1. However, more sophisticated networked systems can be implemented which would reduce the costs entailed within point-to-point modem communication.

2. TECHNICAL REQUIREMENTS FOR IMPLEMENTING A TRADITIONAL ELECTRONIC DATA INTERCHANGE SYSTEM

There are five primary components mandated to place into operation for an EDI system. The following are the features that are used:

1. Exporting data from the organization's host computer system files.
2. Converting the organization's data file into either the ANS X.12 or the UN/EDIFACT data file format.
3. Perform data file transfer from the organization's system to the vendor's system.
4. Converting either the ANS X.12 or the UN/EDIFACT data file format into the vendor's data file format.
5. Importing data to the vendor's host computer system files.

As indicated above, there are two possible file structures that can be utilized for regulating the data between business partners. ANS X.12 is the standard, which is primarily instituted in North American countries.

However, UN/EDIFACT is the standard, which is normally accepted throughout the world.

Once, the data files have been translated, the next technical aspect that must be considered is the methodology that will be placed into practice for data transmission. The host systems (sender and receiver) that are implemented will affect the communication link that needs to be set up. There are two platforms that are possible for data transmission. Asynchronously or synchronously are the two methods that computers systems can communicate in (Stahl, 1994). Through asynchronous communication, computer systems communicate data by way of the serial port. Serial ports are standard hardware devices that are found in all computer environments. However, synchronous data transmission will necessitate supplemental hardware for microcomputer systems interfacing. A 3270 emulation card will be required in a microcomputer system, in order to communicate with a host that is synchronous. Once, the hardware interfacing has been established, the next phase is the software communication's interfacing. A common protocol must be instituted, so that the organization (sender) can transfer the data file to the vendor (receiver). Possible protocols that can be implemented for modem file transfer are XMODEM, YMODEM, ZMODEM, KERMIT, and INDSFILE (Microsoft, 1998).

3. SECURITY ISSUES FOR A TRADITIONAL ELECTRONIC DATA INTERCHANGE SYSTEM

Under a legacy EDI platform, security is not a primary risk factor that information systems (IS) managers have to concern themselves with. In its basic structure, system security comes down to one definition: ensuring that the data on any given computer platform can be kept out of the hands of those who should not access it. Security concerns can be costly as well as complex for IS managers (Anthes, 1995). However, since, there is a direct modem connection between the organization and its vendor, there is an extremely low probability that outsiders will gain access to either computer system. Within this structure a barrier exists that keeps the data secure. Data is only accessible on a one-to-one situation.

In order for communication to take place between organizations and vendors, users accounts would have to be created. User accounts consists of user identification associated with a password. Also, the telephone line's number that corresponds to the modems would have to be available to the organizations and their vendors. Hackers that desire to cause illegal entry to either of the systems would first need to acquire the telephone numbers of the respective systems. There is an extreme low likelihood of this situation coming to fruition. Normally, numbers that are implemented for modem usage are not made available to your every day user. Even, the telephone company is not aware how all

telephone lines are used. As an example, there is no current phone listing for lines that are exclusively being implemented for facsimile operations. This in turn results in a higher security environment for direct modem connectivity.

Second, if hackers were to obtain the telephone numbers, then, they would have to brake through the logon procedures that are implemented by either the organizations or the vendors. However, the key here is to ensure that only the appropriate users are given the telephone numbers for the systems. Most system logon operations scrutinize to ensure that their integrity is not violated. Systems will lock out invalid users from getting into their computer. But, there is no means in fool proofing a computer system. Once, a hacker obtains the telephone number of a business, its computer systems become vulnerable. The more time that is available to the hacker, the easier, it is for them to violate any computer system. However, traditional EDI system is difficult to brake into, since they mandate the usage of known unlisted telephone numbers.

4. INTERNET EDI THE NEXT GENERATION

The world revolves around the usage of computer system. However, the World Wide Web (WWW) has taken computers one-step further. Today, people all over the world can interact and do business with one another as a result of the Internet. In fact, almost any business transaction one requires to make can be accomplished from the comfort of one's own office. Virtually, it is possible to buy and sell any product from a computer system connected to the web. The WWW has become one of the largest networks in existence.

There are many avenues that can be used to connect to the Internet. The simplest form of connectivity is through a standard modem. Modems that were implemented for direct connect EDI; now can be used for Internet EDI. However, faster connections can be established using other procedures such as T1 lines or digital service lines. As a result, the presently functional EDI systems can be ported over to the Internet platform without loss of investment from the older system (Peat and Webber, 1997). Using the WWW provides several advantages with respect to performing day-to-day business operations. Under the previous methodology, each vendor that is performing business functions with an organization will mandate a separate phone call in order for transaction processing to take place. However, using the Internet to carry out the EDI operations, the connection costs of the business partners are drastically reduced. This reduction takes place, since only a flat rate connection charge is required between the companies. It should be noted, that the highest operating expense for EDI systems are communication costs. Figure 2 provides a diagram of business partners performing EDI data transfer using the Internet.

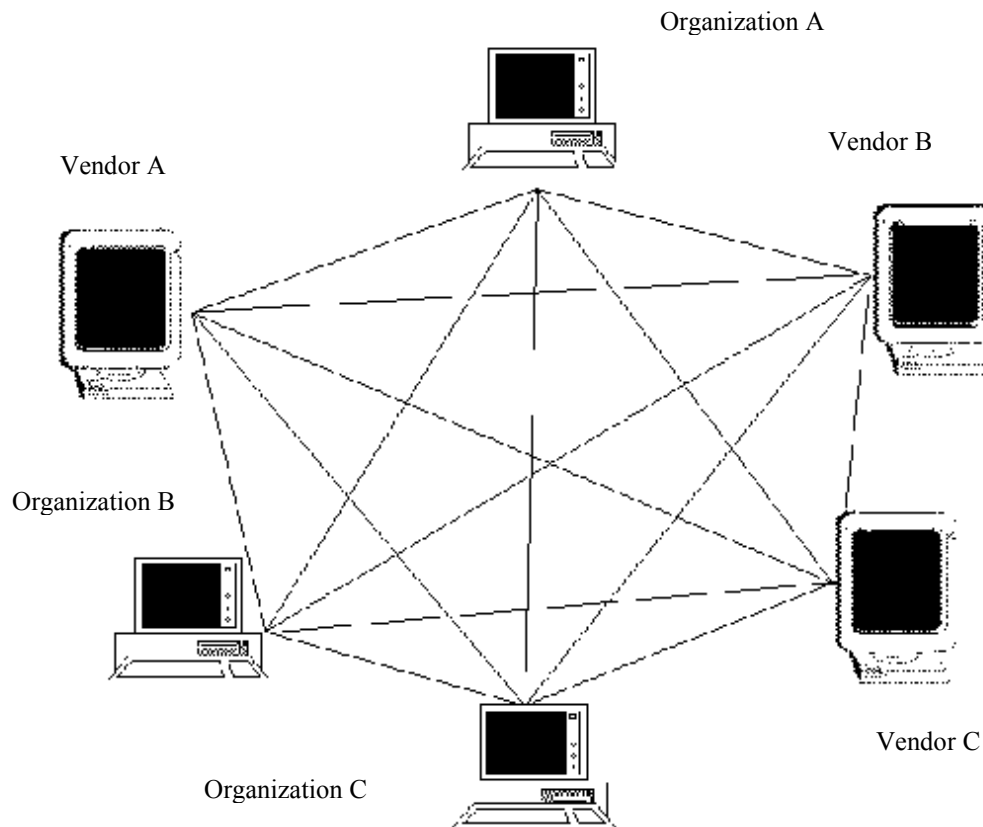


Figure 2 – Internet EDI Transmission Of Data Between Organizations And Vendors

Using traditional EDI systems, organizations basically were limited to batch transactions. In other words, an electronic purchase order would be created and then transmitted to the vendor. If the vendor had the goods in stock, the order would be filled. However, an advantage to implementing an Internet EDI system allows for interactive transaction processing. In this situation, organizations can interact directly with the availability of products from vendors. This permits for higher quality decision-making by managers of organizations.

In a conventional EDI platform, organizations are limited to the trading partners that have been designated in their database. This in turn, only provides a finite number of vendors to work with. However, with the WWW, the

number of trading partners is almost an infinite number. As the Internet increases in size, so will be the number of vendors to perform transaction processing.

5. SECURITY ISSUES OF AN INTERNET EDI

Businesses are connecting to the Internet at an astounding rate, with little or no thought about the ramifications of how this might affect the security of their computer systems. Unless exceptional procedures are taken into consideration, it is no longer possible to be cognizant of who or what is on the other end of a network connection (Bryan, 1995). However, if precautionary procedures are not installed to one's

computer network, there is a higher probability of illegal entry coming to fruition.

Presently, the most important factor affecting network security for an organization is the Internet. Unfortunately, the increase in security problems has not come from mischievous children looking to break their way into a network for fun and games. Instead, a new breed of computer hackers is accomplishing the violation to business computer systems.

Under the traditional EDI system, business partners performed telecommunication in a highly ethical manner. Trust existed between the organizations and their respective vendors. Major protective operations did not have to exist. A regular audit check on the business partners computer systems was not even performed (Ratnasingham, 1999).

EDI on the Internet provides a totally different atmosphere for the business partners. Now, security plays a primary role in transaction data processing. If one's business partners have the opportunity to share information via the WWW, also, hackers will be a threat to these same firms. No matter what hardware or software methodologies are implemented to protect the computer network, there always will be individuals who will attempt to break into the system. As long as a control factor does not prevail, as in the case of the traditional EDI operations, Internet EDI must always be on guard for the unwelcome computer guest.

6. CONCLUSION

The time required to process purchase orders for customers can be greatly improved by moving from traditional EDI to Internet EDI. Also, many cost factors will be reduced in migrating to a more sophisticated technological type of system. However, in an Internet setting, EDI security must be the primary concern of the business partners. The main goals of EDI will be thwarted, if hackers have the opportunity to corrupt the data stored in computer systems. As a result, the influence of EDI risks and its impact on trust is imperative when considering the business continuity of EDI organizations. If the Internet cannot provide the integrity of traditional EDI, then, the only solution in the future may result in reverting back to the older model.

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