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Review on Electronic Data Interchange(EDI)

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Abstract— EDI is the electronic exchange of business documents in a standard, computer processable, universally accepted format between trading partners (TPs). TPs have to agree upon the format of the business documents which is sent as a data file over an electronic messaging services.

Keywords: Electronic; exchange; business documents

1. Introduction

All organization and administrative association with large information system faces a situation where typing and printing of all information is no longer feasible. It is difficult to manage this. These forms should be entered in the computer for processing, and response should be generated and posted to the concerned parties. The whole process is time consuming and prone to human errors during data entry and expensive to operate.

So EDI is used. EDI is quite different from sending electronic mail, message or sharing files through a network. In EDI, the computer application of both the sender and receiver referred to as *Trading Partners,* have to agree upon the format of the business document which is sent as a data file over an electronic messaging services.

Following fig illustrates how EDI messages can be used to totally automate the procurement process between two trading partners:-

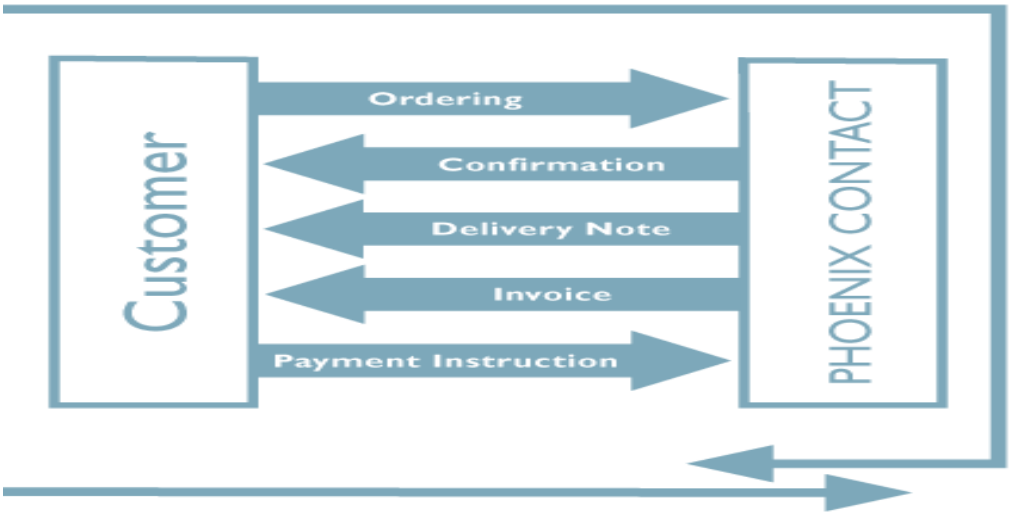

Fig. EDI-enabled procurement process

The two key aspects of EDI that distinguish it from other forms of electronic communication are:-

i. The information transmitted is directly used by the recipient computer without the need for human intervention. It involves two or more organization communicating business information with each other in a common agreed format.

ii. The repeated keying of identical information in the traditional paper-based business communication creates a no. of problems that can be significantly reduced through the usage of EDI.

Benefits of EDI

The benefits accuring from EDI implementation can be broadly classified into direct benefits and long terms strategic benefits.

Direct Benefits

- The transfer of information from computer to computer is automatic.
- Cost of processing EDI documents is much smaller than that of processing paper documents.
- Customer service is improved.
- Information is managed more effectively.

Strategic Benefits

- Customer's relations are improved through better quality and speed of services.
- Competitive edge is maintained and enhanced.
- Reduction in product costs can be achieved.
- More accurate sales forecasting and business planning is possible due to information availability at the right place at right time.

II. NETWORKING INFRASTRUCTURE FOR EDI

For the successful functioning of EDI, it assumes availability of a wide area network to which organization can subscribe. All organization that is willing to join EDI services must subscribe to the common n/w. In addition, all organization participating in a particular EDI service group that they will use, and load appropriate EDI software on their computer systems. This software is responsible for providing translation services.

EDI services and network access services as shown in fig.

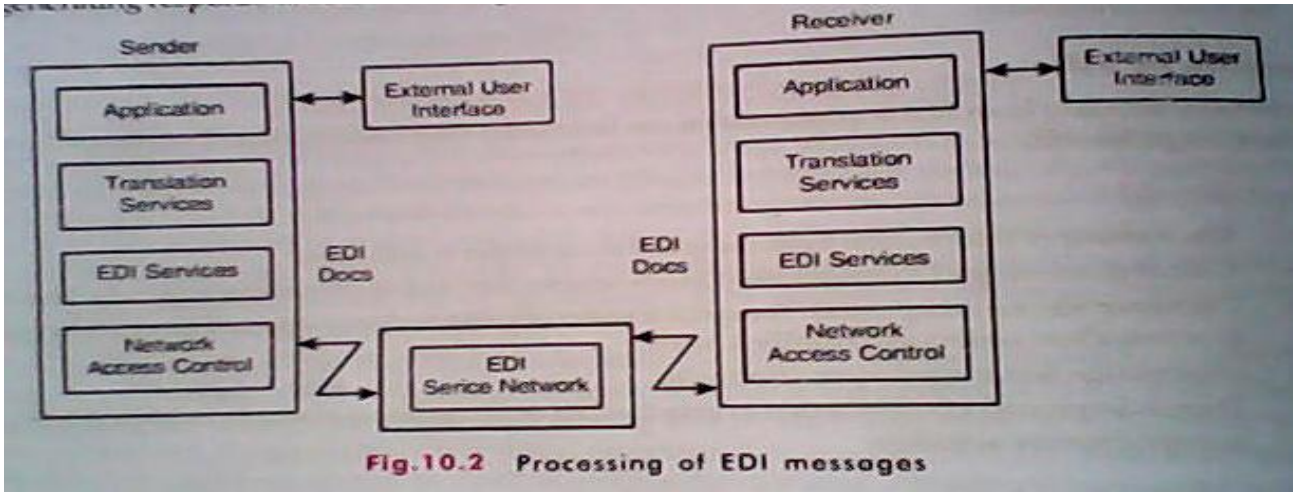

Fig.10.2 Processing of EDI messages

When a sender's computer system produces a message and passes it to the translation service software. This translates the message into the common agreed structure and passes it to EDI service software. EDI service s/w executes necessary functions and procedures to send the message, tack it in the network and ensure that it reaches its destination. EDI services, in addition may include procedures to ensure security functions, billing and accounting functions and generate necessary logs for auditing purposes. Network access services are responsible for actually controlling the interaction with the network that transports messages from one site to another.

The transport network provides a powerful electronic messaging service to support EDI services. Transport n/w uses a "store and forward mechanism" and messages are sent to 'mail boxes' that are managed by the network service provider. The originator can send his messages at any time independent of the recipient's system status. The recipients system periodically checks their mailboxes and transfer messages from n/w mailboxes to their own memory. Thus a transfer cycle is completed.

I. FUNCTIONING OF EDI

Any organization using EDI communicates with their trading partners, in one of the two ways:-

- Exchange of data with several trading partners directly.
- Interaction with multiple companies through a central information- clearing house.

In the latter case, all transactions take place through a third party's computer system, which then sends them to the appropriate receiver's computer.

A typical EDI configuration is depicted in fig.

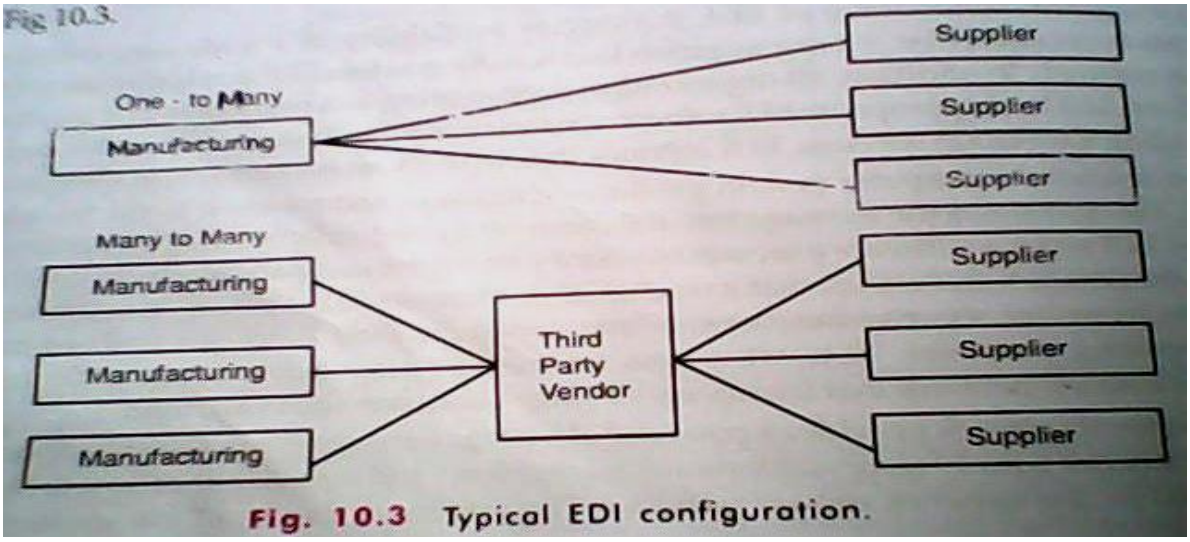

Fig. 10.3 Typical EDI configuration.

EDI works in the following manner:

- Prior to any computer work, representatives of two companies interested in exchanging data electronically meet to specify the application in the EDI standards, which they will implement.
- The two companies exchange data electronically in the standard format.
- Each company adds EDI program to its computer to translate the company data into standard formats for transmission and for the reverse translation in the data it receives.

Once a company has established standardized communication with another company, it is now in a position to communicate with any other company that is also using EDI standards.

II. EDI COMPONENTS

A typical EDI system converts generic EDI message format to RDBMS format and from RDBMS format to EDI format. RDBMS database contains the data to be translated into EDI format and where EDI data to be converted to EDI configuration programs do these translations.

There are three main components of an EDI system as shown in fig.

I. Application service
II. Translation service
III. Communication service

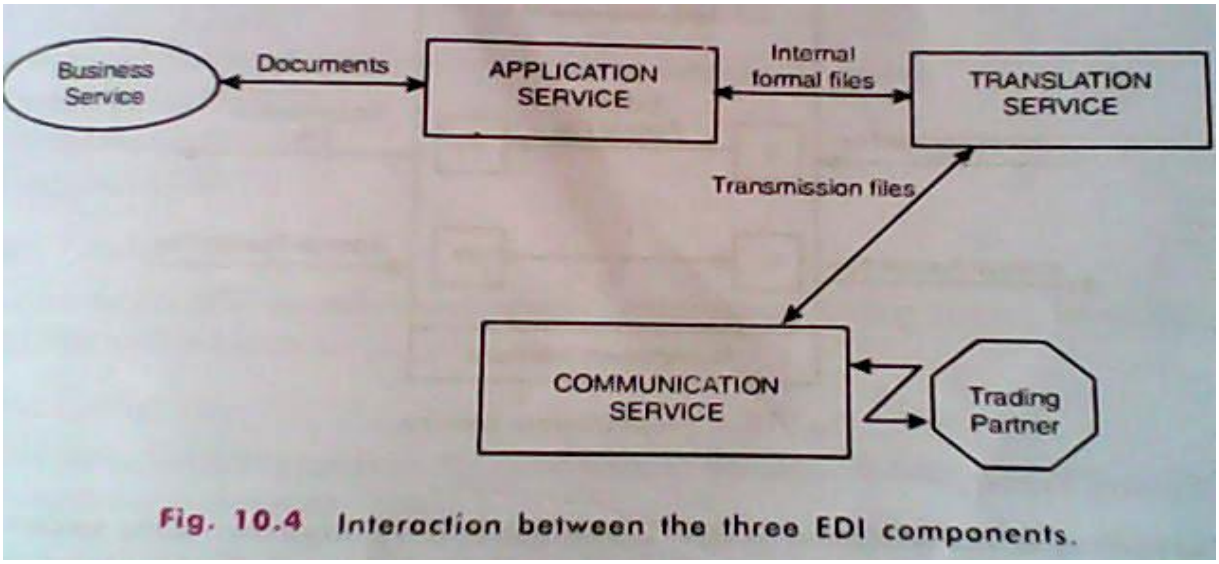

Fig. 10.4 Interaction between the three EDI components.

Application service

The application service provides the link between a business application and EDI. It allows us to send document to and receive documents from an EDI system.

A set of callable routines is used to transfer documents from the business application into EDI. Documents destination can be either intra-company or to external companies.

The EDI application service holds each incoming and outgoing document as a single internal format file. EDI converts the documents to a standard format and sends it to be trading partners the relevant communication protocol.

The application service has been depicted in fig.

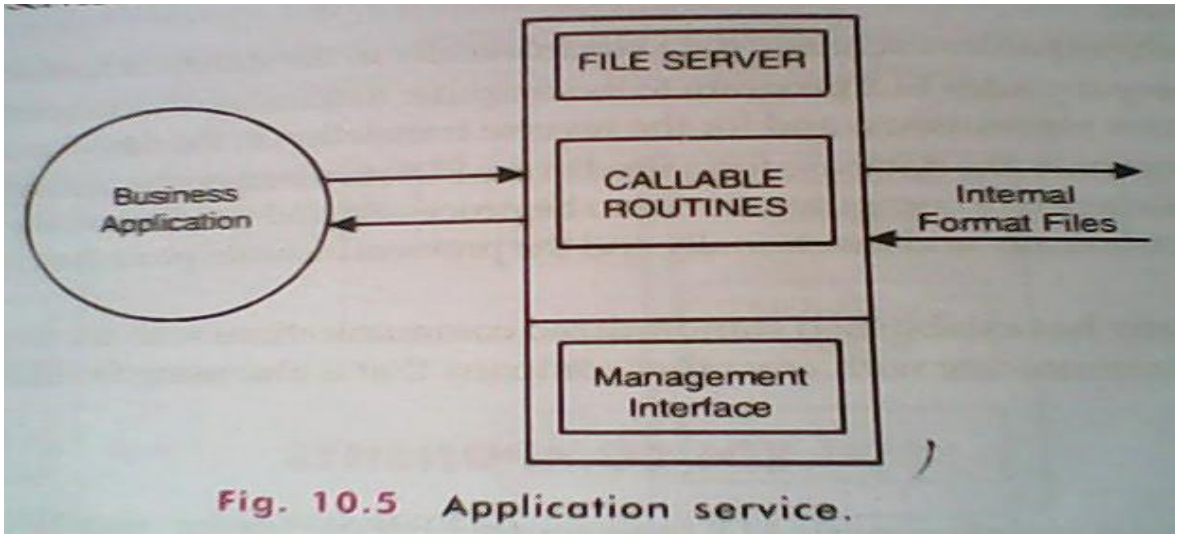

Fig. 10.5 Application service.

Translation service :

- It converts the outgoing documents from an internal format file to an agreed external format.
- Translates incoming documents from an external format to the EDI internal format file.

The translation service has been depicted in fig.

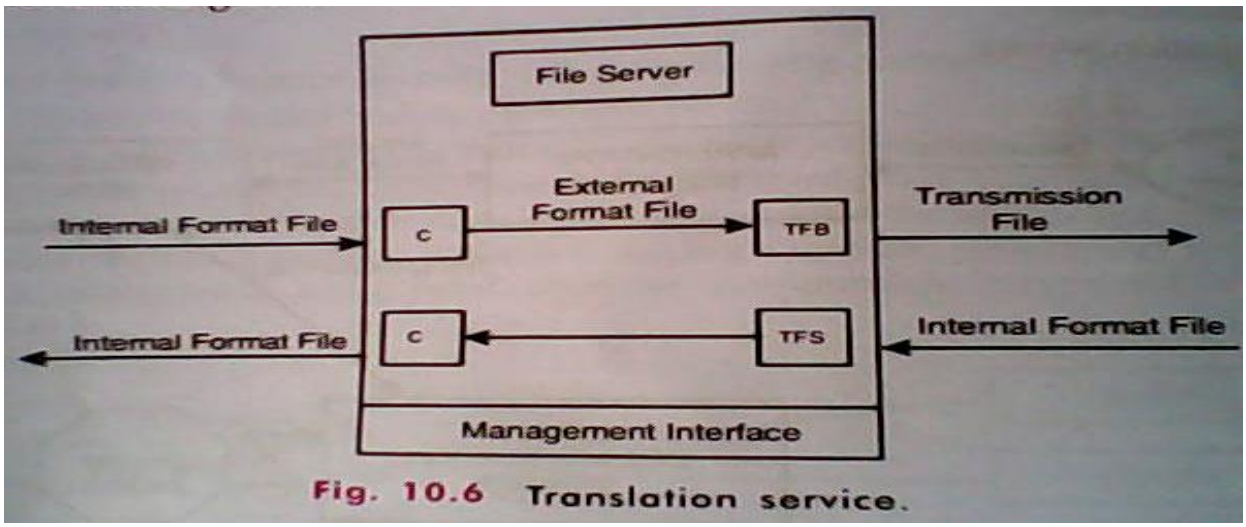

Fig. 10.6 Translation service.

Communication service:

The communication service sends and receives transmission files to from the trading partners either directly or by using a third party service called a ***value added network (VAN).*** Communication service performed its function as:

For outgoing documents:

- The communication service receives a transmission file from the translation service. It checks the file to see which trading partner it has been sent to. When it has identified the type of connection to be used for this trading partner it determines which gateway to use.
- The communication service sends the transmission file to the translation service.

For outgoing documents:

- The communication service receives a transmission file from the trading partner. The file arrives through one of the gateways that EDI support.
- The communication service sends the transmission file to the translation service.

The communication service has been depicted in fig.

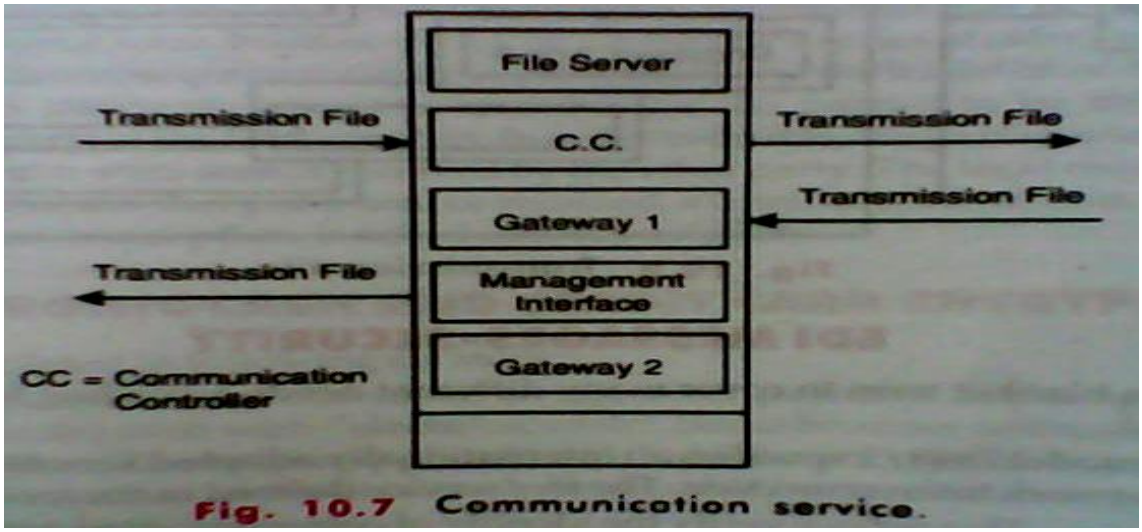

Fig. 10.7 Communication service.

III. TYPES OF FILES

EDI creates the following files as a document passes through the system.

i. Internal format file(IFF)
ii. External Format File(EFF)
iii. Transmission file(TF)

Internal format file:-

Internal format file contains a single document for a single trading partner. Internal format file is principally for EDI's own use.

External format file:-

External format file contains the same data as the internal format file translated into the appropriate standard document format.

Transmission file:-

Transmission file contains one or more documents for the same trading partner.

Transmission file has been depicted in fig.

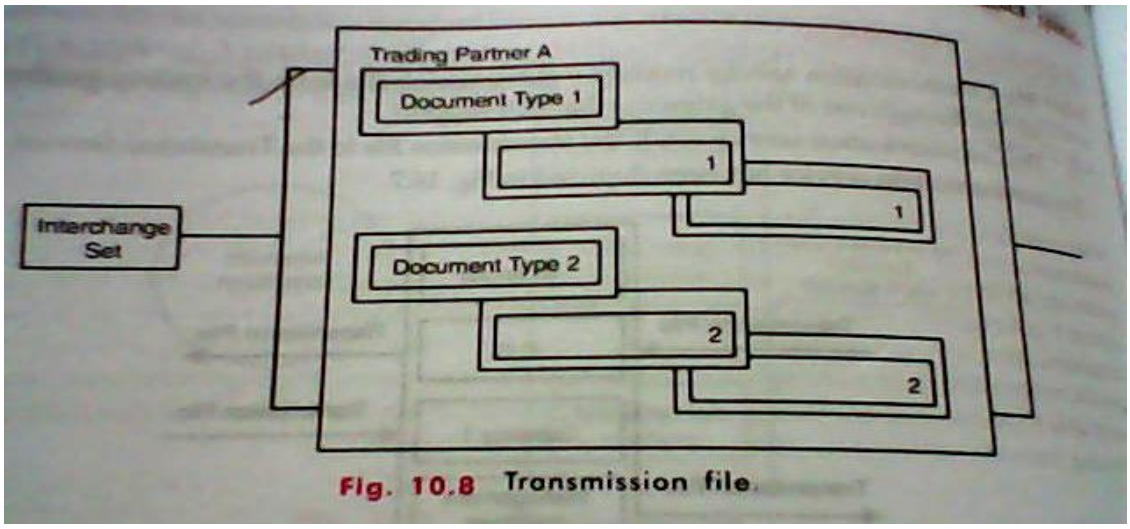

Fig. 10.8 Transmission file.

IV. EDI MESSAGE SECURITY

Security is used as a blanket term to cover many different needs according to the data and used to which it is being put. Five services defined are:

- **Authentication:** This service verifies the identity of communication entities in a network.
- **Access control:** it restricts access to the information and processing capabilities of a network to authorized entities.
- **Confidentiality:** it prevents the unauthorized entity a modification of information.
- **Integrity:** it detects whenever there is unauthorized modification.
- **Non-repudiation:** prevents denial by one of the entities involved in a communication of having participated in all or part of the communication.

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