

Technical Note

EDI : TECHNOLOGY FOR PAPERLESS TRANSACTIONS

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ABSTRACT

"Electronic Data Interchange" or EDI refers to the electronic transmission of commercial documents in a standard format. The standardized characteristics of the electronic transmission will allow a business transaction to be conducted in a purely automated manner. This tutorial paper will discuss the technical concepts of EDI using as an example the UN EDIFACT standard.

INTRODUCTION

"Electronic Data Interchange" or EDI refers to the **ELECTRONIC TRANSMISSION of COMMERCIAL DOCUMENTS in a STANDARD FORMAT**. The technical aspects of these points are discussed in this tutorial paper, with particular emphasis on the emerging international standard -- UN/EDIFACT.

Conventional commercial transactions are based on the exchange of physical documents such as Price Catalogue, Request for Quotation, Purchase Order, Invoice, and the like. A typical transaction involves several exchanges of forms between a buyer and seller, and may also include third parties such as banks (Fig. 1). Governments--through customs, central banks, and their regulatory agencies--also participate actively in this paper exchange.

The diversity of forms poses problems in manual or computer processing. In a certain type of document such as an Invoice issued by different companies, the physical presentation of information may vary so that someone unfamiliar with the form has to browse through it to locate an item of information. Or the same information may be represented in different ways, as when a date is given as "mmdyy" or "ddmmy" so that a date like "10-9-92" becomes ambiguous.

Moreover, certain terms or symbols may be subject to local interpretation. For example, the symbol "\$" could refer to the currencies of several countries. For international transactions, the problems multiply when the form is in an unfamiliar language. Therefore, a document has to be manually read and processed by someone familiar with the context and language of the business transaction.

In a typical transaction such that depicted in Figure 1, information can be manually copied from one form to another. Or, information may be manually encoded for computer processing, after which a new form will be printed and forwarded to another office. At the receiving office, the form will be manually sorted, checked, and subjected to the same procedure. When this procedure is repeated over several cycles, data entry (encoding) and other errors can creep in to disrupt the smooth flow of a transaction.

Since pieces of paper can be misplaced or incorrectly routed, it is usually necessary to retain duplicate copies or maintain document tracking systems that increase the amount of paper used and handled. Moreover, with several copies being filed, it becomes difficult to trace several versions of a document, each with some small modification over the previous version.

All of the above characteristics of the conventional business process add to the cost of materials and man-hours to process forms, and to the time consumed in processing each form. It has been reported that in Europe, the cost of manual paperwork is about 3.5% to 15% of the value of the commodity being traded. One case study estimated this cost at \$10.00 per invoice manually processed [1]. The UN "Uniform Rules Of Conduct For Interchange Of Trade Data By Teletransmission" (UNCID) states that "...paper documentation and procedures represent as much as 10 per cent of goods value...The possibilities of cost reduction are in the order of 50 per cent..." [6]. A more extreme conclusion was reached in a 1985 study by the UK government Standardization of International Trade Procedures Board and the Midland Bank International PLC which found that no less than 50% of letters of credit were rejected during first presentation, mostly due to encoding error or information loss [2].

In their desire to speed up and to automate transactions, businesses have turned to Electronic Data Interchange. In an EDI world, paper documents are replaced by computer "messages" that are electronically transmitted and are machine-readable. Each type of form is given a well-structured computer-readable format in which data items are represented in a uniform, universally understood way. In a given form or message, the data items have a standard order or placement. In theory, these characteristics will allow a business transaction to be conducted between two different computers so that information flows directly from one database to another (perhaps different) database in a form such as that depicted in Figure 12.

Some current standards for EDI include:

1. EDIFACT or "EDI For Administration, Commerce and Trade" a UN-sponsored standard that is expected to become the future umbrella EDI standard;
2. ANSI X.12, the U.S. EDI standard [2,3]; and
3. Various industry-specific standards, such as SWIFT for banking [4] or CEDEX for the shipping industry [10,11].

This paper will discuss the technical concepts of EDI from the point of view of the UN EDIFACT standard. The paper is organized as follows. First, a brief history of EDIFACT and other standards is given. Then, general concepts of EDI are presented by analogy to paper documents. After this, the structure of EDIFACT messages and the documents describing the standard are discussed in the remaining sections.

A SHORT HISTORY OF EDIFACT AND EDI STANDARDS

EDI standards originated in the U.S. transportation industry where a family of standards was developed by the Transportation Data Coordinating Committee (TDCC) beginning in 1969 [3].

In 1979, the American National Standards Institute (ANSI) created a committee to develop cross-industry standards that became known as ANSI X.12, now the most widely used standard in the U.S. Specific industries have adopted various subsets of X.12. In addition to TDCC, a sampling of U.S. standards includes [5]:

- AIAG - Automotive Industry Action Group
- EDX - Electronics Data Exchange (electrical industry)
- EIDX - Electronics Industry Data Exchange
- CIDX - Chemical Industry Data Interchange
- WINS - Warehouse Information Network Standards
- UCS - Uniform Communications Standard (grocery industry)

In 1981, the United Nations Economic Commission for Europe (UNECE) developed and published the first "Guidelines For Trade Data Interchange". In 1986 this was renamed to EDIFACT and submitted to the International Standards Organization (ISO), which adopted its syntax rules in the same year as an international standard under a fast-track procedure. More information on the history of development work on EDIFACT can be found in the Introduction of [6].

EDIFACT is positioned to become the worldwide EDI standard, since it is endorsed by the UN and ISO and widely used in Europe. It has been accepted by the U.S. Customs, and is being adopted by Japan and the newly industrialized countries of Asia.

GENERAL CONCEPTS OF EDI

A physical document has a structure that can be described in terms of:

- the format or physical arrangement of information within the document;
- the units of information used in the document, and how these are combined; and
- the special symbols that delimit fields or units of information.

For example, a business letter from an English writer is composed of English words and proper names using the letters of the English alphabet and other symbols found on a typewriter. The correspondence consists of standard groups of information (the "parts" of a letter) in the following order: sender, date, addressee, salutation, body, closing, and signature. The

"addressee" is a logical grouping of simple information elements like: Proper name, title, company name, street address, city, zip code, and country. The separators between words and the different parts usually are spaces, punctuation marks or blank lines. Within the body of the correspondence, information is arranged in sentences that follow English grammar (syntax) and spelling rules. (But note that English grammar and spelling differs across continents!) This structure probably has developed because it is convenient for humans to read and understand.

The letter (document) is placed inside an "envelope" that protects it while being transported. The envelope itself has a format for information needed to get it to its destination. Conventionally, these are: sender's name and return address on the upper left hand corner; addressee's name and address in the center; stamp on the upper right hand corner; and special instructions (ex., "Air Mail") on the lower part.

The form of an electronic message can be standardized in an analogous, but more formal and rigorous, way so that the electronic message can be read and processed by a computer program. Thus, EDI paves the way for truly universal and paperless information exchange and computerization.

EDI standards generally include the following components or specifications:

1. MESSAGE SYNTAX--A structure for actual message including the general and specific formats of documents and data elements;
2. ENVELOPE SYNTAX--A structure for the "envelope" that surrounds the data elements;
3. COMMUNICATION PROTOCOL--The electronic transport medium that carries the message (with its envelope) from one computer to another.

In the flow of business, a document may be acted upon in sequence by several persons or offices. Similarly, an EDI message may be partially processed by one office (more specifically by a computer in an office) which may add or modify data in the message, or create a new document based upon the old. The new or modified message can be passed on to another office for further processing.

Each step in processing may be completely automated or may involve manual choices by a human user. For example, logging and acknowledging the arrival of a message (equivalent to receiving a paper document) may be done automatically. However, a message authorizing withdrawal of funds had better be initiated by a person!

SPECIFIC CONCEPTS OF EDIFACT

This section provides an overview of the concepts and applicable standards for EDIFACT. The details will be presented in subsequent sections.

The "official" definition of EDIFACT is given by the following extract from UNTDID:

"United Nations rules for Electronic Data Interchange For Administration, Commerce and Transport. They comprise a set of internationally agreed standards, directories and guidelines for the electronic interchange of structured data, and in particular that related to trade in goods and services between independent, computerized information systems."

EDIFACT standardizes the following aspects [9]:

1. MESSAGE SYNTAX - Analogous to grammar, it defines what a message contains, and in what order;
2. DATA ELEMENT - Analogous to a vocabulary, it defines the smallest units of information (the "words");
3. DATA SEGMENT - An intermediate unit of information, consisting of a group of related data elements (standard "phrases"); and
4. STANDARD MESSAGES - Also referred to as "UNSA", these are the complete commercial documents.

The major documents describing EDIFACT standards are [6-9]:

1. UNTDED : The United Nations Trade Data Elements Directory. Also released as ISO 7372 (This is the "dictionary" of EDIFACT)
2. UNTDID : The United Nations Trade Data Interchange Directory that contains:

- EDMD : The EDIFACT Data Messages Directory
- EDSD : The EDIFACT UNSM Standard Data Segments Directory
- EDCD : The EDIFACT Composite Data Elements Directory
- EDED : The EDIFACT Data Elements Directory
- EDCL : The EDIFACT Code List for UNSMs
- ISO 9735 EDIFACT Application Level Syntax Rules
- The UN EDIFACT Syntax Implementation Guidelines
- The UN EDIFACT Message Design Guidelines

EDIFACT is only concerned with the electronic document. The "envelope" that usually corresponds to an electronic mail (e-mail) structure is outside the scope of EDIFACT. However, there appears to be a trend towards the use of the CCITT X.400 Message Handling System (MHS) standard for this purpose.

Similarly, the communication protocol is outside the scope of EDIFACT and can be anything that transfers a file between computers. Examples are TCP/IP that is favored in Unix systems, X.25 packet switching, SNA, or even dial-up protocols. It should be mentioned that the EDIFACT standard is general enough to include the possibility of physical transfer of electronic media, such as magnetic tapes or disks.

Different industry groups have built upon the structure of EDIFACT by selecting the parts applicable to their industry, and extending the standards when necessary. An example is the "Container equipment data exchange" (CEDEX) [10,11].

DATA ELEMENTS

The basic unit of information in EDIFACT is the DATA ELEMENT defined as "a unit of data for which the identification, description and value representation have been specified" in a data elements directory [6]. This directory is UNTDED [7].

In EDIFACT, data elements are composed of the printable symbols in the ASCII character set (ISO 646 Information processing -- ISO 7-bit coded character set for information interchange) shown in Fig. 2. Generally, ASCII is considered to be the lowest common denominator for information exchange among computers. The ASCII character set can be used with any method of communication, including printed documents, telex, and other electronic media.

A data element is described by three attributes:

1. TYPE--numeric, alphabetic, or alphanumeric;
2. LENGTH--the number of ASCII characters;
3. MEANING/INTERPRETATION--the specific interpretation to be given to the data element.

The UNTDED notation shown below is used to specify the type and length of each data element:

| | |
|--------|--|
| a3 | 3 alphabetic characters, fixed length |
| n6 | numeric characters (numbers), fixed length |
| an5 | 5 alphanumeric characters, fixed length |
| a..6 | up to 6 alphabetic characters |
| an..35 | up to 35 alphanumeric characters |
| n..9 | up to 9 numeric characters (number) |

Various data elements may be seen in the example message of Figure 12. The data elements are the alphabetic or numeric codes separated by punctuation marks. EDIFACT data elements are broadly grouped into the nine categories listed below. The numbers inside parenthesis are used to catalogue these data elements.

Group 1:(0001-0499) Service data elements; (1000-1499) Documentation, references
Data elements intended for data handling or documentation purposes.

Group 2:(2000-2499) Dates, times, periods of time
Dates, periods of time, time limits, etc.

Group 3:(3000-3499) Parties, addresses, places, countries

Group 4:(4000-4499) Clauses, conditions, terms, instructions Authentications, authorizations,

endorsements, certifications, clauses, conditions, terms, reference clauses, stamps, labels, requests, instructions, receipts, statements, information texts;

Group 5:(5000-5499) Amounts, charges, percentages

Group 6:(6000-6499) Measure identifiers, quantities (other than monetary) Dimensions, weights, volumes, distances, etc.

Group 7:(7000-7499) Goods and articles: descriptions and identifiers

Descriptions, classifications and identification of goods and articles, consignment identifiers, number and kind of packages, dangerous goods details;

Group 8:(8000-8499) Transport modes and means, containers Identification and description of means of transport and containers, transport equipment details, transport modes and movements, voyage and flight numbers;

Group 9:(9000-9499) Other data elements (Customs, etc.)

Data elements can also be codes for standard phrases that have well-defined and accepted meanings, thus avoiding ambiguity and in certain cases even shortening messages by avoiding the long phrases themselves. For example, ISO 3166 (Codes for the representation of names of countries) provides standard 2-letter or 3-digit codes for representing names of countries. This code is part of a suite adopted for EDIFACT, that also includes codes for the following [7]:

- Document names and tags
- Country and currency codes
- Mode of transport code
- Codes for incoterms
- Location code
- Codes for units of measurement used in international trade
- Codes for type of container movement
- Codes for package names
- IATA Cargo-IMP codes
- Data elements code lists

Four classes of code lists are distinguished in EDIFACT:

- Class 1: service data element code lists (0001/0999);
- Class 2: user data element code lists, maintained under UN/EDIFACT procedures;
- Class 3: user data element code lists included in international code lists, issued as ISO international standards and UN/ECE;
- Class 4: proprietary code lists (industry or sector code sets) maintained by parties other than UN/EDIFACT, ISO and UN/ECE.

Examples of codes maintained by industry include IATA airline codes and SWIFT bank codes (although these examples are outside the scope of EDIFACT). An example of an industry-

specific code maintained by ISO are the codes for "Freight containers--Container equipment data exchange (CEDEX)" [10]. Figure 3 shows a sample of these codes.

DATA SEGMENTS

A DATA SEGMENT is defined as "a predefined and identified set of functionally related data elements values which are identified by their sequential positions within the set." [6,9].

In EDIFACT, a data segment consists of several data elements and separator characters (see Figure 2) as shown in Figure 4a. The TAG is a standard alphabetic abbreviation that identifies the type of data element involved. A colon (:) separates the tag code from its value (in case there is one), while a plus sign (+) separates data elements. The apostrophe (') delimits or ends the data segment, to separate it from the next data segment that follows. In case a data element is omitted, its position can be marked by keeping the plus signs before and after the position, thus resulting in successive separators (+ +).

Figure 4b shows an example of a data segment that may also be seen in the message in Figure 12. This particular data segment is used to identify a name and address for a sender, receiver or other party (usually a corporate entity).

Data segments are listed and defined in the "Standard data segments directory" or EDSD [6] (Figure 5). As an example, the definition of a data segment for a monetary amount is given in Figure 6. The definition gives the tag (MOA) and full name, the function, and the individual data elements in the order that they occur. Each data element is referenced by its catalogue number (technically, a "data element identifier" to cross-reference with UNTDED or EDED where the data element definitions are found). Individual data elements, or groups of data elements, are designated as either "mandatory" (M) meaning their use is required, or "conditional" (C) meaning that EDI users may elect not to include them.

MESSAGES

An EDI message, corresponding to a commercial document, is "a set of segments in the order specified in a Message directory starting with the Message header and ending with the Message trailer" [6].

Further, UNTDID specifies that "A United Nations Standard Message (UNSM) is one which:-

- i) has been registered, published, and which is maintained by the United Nations Economic Commission for Europe;
- ii) has the values contained in the Controlling Agency, Message Type, Message Version Number and Message Release Number fields (the requirements for the use of which are specified in ISO 9735), allocated and controlled by the UN/ECE;
- iii) always has the code value "UN" in the Controlling Agency field."

The general structure or syntax of an EDIFACT message is shown in Figure 7, and an example of a message that uses this syntax is shown in Figure 11. An EDIFACT message consists of a series of data segments separated by the segment terminator (').

UNH and UNT form a header-trailer data segment pair that contains control information such as: message reference number, message type, message version number (in case the message format is changed), the agency controlling the message format, and other related information. Between these two segments are the user segments with tags and delimiters (').

The entire message is an ASCII string, unblemished by the usual carriage returns or linefeeds or control characters found in computer script files for terminal/printer control. Such a string is very easy for a computer program to parse, by searching for tags and delimiters, and matching data element codes against a dictionary.

Although an EDIFACT message is printable because of the choice of character set (Figure 2), it is generally not "human-readable" for two reasons. First, the string formats are difficult to follow. Second, the multiplicity of codes (alphabetic and numeric) would greatly burden human memory. This does not pose any problem in man-machine interface, however. An EDI software can present the information contained in an EDIFACT message in a user-friendly format, by expanding codes and acronyms to full words or phrases as necessary. For input, the user can be asked to select from a menu, with descriptions of code meanings.

Messages are described by a branching diagram as shown in Figure 8. Each data segment is represented by a box, with the segment tag or name at the top. The sequence of segments is determined by tracing the diagram from left to right and (when a branch is reached) from top to bottom. Each segment is designated as mandatory (indicated by "M" inside the box) or conditional (indicated by "C"), and the number of times it may be repeated is shown as a number in the lower right hand corner of the box. A more detailed description of the processing sequence and the conventions used in such diagrams is found in Appendix 1 of the EDIFACT Syntax Rules [6].

A list of UNSMs is given in Figure 9. Industries have also set up industry-specific message types following the pattern of EDIFACT (but strictly speaking outside the scope of EDIFACT). An example is the "Container Equipment Data Exchange" (CEDEX) [11] shown in Figure 10.

INTERCHANGE

The largest unit of exchange between computers is called the INTERCHANGE. It consists of one or more messages as depicted in Figure 11. For example, a complex "document" may consist of several pages, each one a simple and standardized document in itself.

UNA (Service String Advice), UNB (Interchange Header) and UNZ (Interchange Trailer) are the interchange data segments that contain control information such as: the agency controlling the EDI syntax, the sender and recipient (identified by codes), date/time, reference number and other related information. Between the two headers and the trailer are the messages themselves.

Thus the interaction between two computers consists of the exchange of such interchanges.

CONCLUSION

A recent article boldly stated: "In some ways, EDI is the ultimate in open systems, linking every conceivable type of business computer" [5]. Certainly, it facilitates paperless, electronic application-to-application communication. This is a more advanced concept than the current computer-to-computer connectivity that allows a user or program to transfer files, or to fetch data from another computer. It is also significantly different from conventional electronic mail that transfers documents for a human recipient to read. Application-to-application communication will permit one application system to transfer data from its database to the database of a foreign application system, without intermediate encoding.

EDI is a combination of the following elements:

1. Agreements (in the form of standards) among users and application systems developers on standard formats for documents;
2. Agreements on standard names, terms, codes, and other data elements;
3. Standard electronic transmission mechanisms (e-mail and communication protocols); and
4. Conversion mechanism or software from in-house data formats to the standardized formats.

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[10] ISO 9897-1 Freight containers--Container equipment data exchange (CEDEX)--Part 1:
General communication codes

[11] ISO 9897-3 Freight containers--Container equipment data exchange (CEDEX)--Part 3:
Message types for electronic data interchange

```

      :
B   :   Request for Quotation -----> :   S
      :
U   :   <----- Quotation             :   E
      :
Y   :   Purchase Order ----->       :   L
      :
E   :   <----- Purchase Order Response :   L
      :
R   :   Order Change Request ----->  :   E
      :
      :   etc. ...                       :   R

```

FIGURE 1. Document exchanges in a hypothetical commercial transaction

| | | |
|------------------------|--------|--|
| Letters, upper case | A to Z | |
| Numerals | 0 to 9 | |
| Space character | | |
| Full stop | . | |
| Comma | , | |
| Hyphen/minus sign | - | |
| Opening parentheses | (| |
| Closing parentheses |) | |
| Oblique stroke (slash) | / | |
| Equals sign | = | |
| | | Reserved for use as: |
| Apostrophe | ' | segment terminator |
| Plus sign | + | segment tag and data element separator |
| Colon | : | component data element separator |
| Question mark | ? | release character |

The following characters are part of the level A character set but cannot be used internationally in telex transmissions:

| | |
|-------------------|---|
| Exclamation mark | ! |
| Quotation mark | " |
| Percentage sign | % |
| Ampersand | & |
| Asterisk | * |
| Semi-colon | ; |
| Less-than sign | < |
| Greater-than sign | > |

FIGURE 2. UN EDIFACT Level A character set (From [6,9])

| Numerical Code | Name | Description | CEDEX Code |
|----------------|----------------------|--|------------|
| 05000 | Material unspecified | Material is not specified | MU |
| 05100 | Steel unspecified | Material is steel of no specific type | SU |
| 05110 | Steel, carbon | Material is of carbon steel | ST |
| 05120 | Steel, cor-ten | Material is of cor-ten steel | SK |
| 05130 | Steel muffler | Material of muffler grade steel (semi-corrosion resistant) | SM |

FIGURE 3. Some codes to describe material type in the "Container Equipment Data Exchange" (CEDEX) standard [11]
 (Note: This is not a complete listing.)

Segment Tag + Data Element + ... + Data Element'

Note:

Segment Tag = Segment code : Value
 Tag and Data Element separator is ASCII "+"
 Segment Separator (i.e., terminator) is an apostrophe (')

FIGURE 4a. Structure of an EDIFACT data segment

Data Segment:

NAD+ED+xyzmr1234:IB

Data Elements used:

NAD - code for Name and Address Segment
 ED - Party Qualifier (ED = delivering agent)
 xyzmr123 - Party identification code
 IB - Code list identifier
 (IB = ISO Business Directory)

Figure 4b. Example of an EDIFACT data segment (From [11])

| Segment Tag | Name |
|------------------------|--|
| ALI | Additional information |
| API | Additional price information |
| PIA | Additional product id |
| ALC | Allowance or charge |
| ERC | Application error information |
| EQA | Attached equipment |
| AUT | Authentication result |
| BGM | Beginning of message |
| BUS | Business function |
| CHD | Charge details |
| CPI | Charge payment instructions |
| COM | Communication contacts |
| CTA | Contact information |
| CNT | Control totals |
| CUX | Currencies |
| CST | Customs status of goods |
| VLN | Customs valuation declaration |
| DGS | Dangerous goods |
| DTM | Date/time/period |
| SDQ | Destination quantity |
| TDT | Details of transport |
| DIM | Dimensions |
| DLI | Document line identification |
| DOC | Document/message details |
| DMS | Document/message summary |
| DCR | Documentary requirement |
| TAX | Duty/tax/fee details |
| EQD | Equipment details |
| ERP | Error point details |
| FCA | Financial charges allocation |
| FII | Financial institution information |
| FTX | Free text |
| UNG | Functional group header |
| UNE | Functional group trailer |
| GIS | General indicator |
| GDS | Goods description |
| GIR | Goods identification related numbers |
| GIN | Goods identity number |
| GID | Goods item details |
| GOR | Governmental requirements |
| HIN | Handling instructions |
| HAN | Hazardous material handling instructions |
| UNB | Interchange header |
| UNZ | Interchange trailer |
| IMD | Item description |

| | |
|-----|------------------------------------|
| LTM | Lead time |
| LIN | Line item |
| MEA | Measurements |
| UNH | Message header |
| UNT | Message trailer |
| MOA | Monetary amount |
| AJT | Monetary amount adjustment details |
| NAD | Name and address |
| EQN | Number of units |
| PAC | Package |
| PCI | Package identification |
| INP | Parties to instruction |
| PAI | Payment instructions |
| PAT | Payment terms basis |
| LOC | Place/location identification |
| QTY | Quantity |
| QVA | Quantity variances |
| RFF | Reference |
| SCC | Scheduling conditions |
| SEL | Seal number |
| UNS | Section control |
| SGP | Split goods placement |
| TMP | Temperature |
| TOD | Terms of delivery |
| TCC | Transport charge/rate calculations |
| TMD | Transport movement details |
| TPL | Transport placement |
| TSR | Transport service requirements |

**FIGURE 5. Listing of EDIFACT data segments by name
(From Standard data segments directory--EDSD [6])**

| | | |
|--|--------------------------------|---------|
| MOA | MONETARY AMOUNT | 91.2 |
| Function: To specify monetary amounts. | | |
| 5007 | MONETARY FUNCTION QUALIFIER | M an..3 |
| C516 | MONETARY AMOUNT | C |
| 5025 | Monetary amount type qualifier | M an..3 |
| 5004 | Monetary amount | C n..18 |
| 6345 | Currency, coded | C an..3 |
| 6343 | Currency qualifier | C an..3 |
| 4405 | Status, coded | C an..3 |

| | | |
|------|--------------------------------|---------|
| C516 | MONETARY AMOUNT | C |
| 5025 | Monetary amount type qualifier | M an..3 |
| 5004 | Monetary amount | C n..18 |
| 6345 | Currency, coded | C an..3 |
| 6343 | Currency qualifier | C an..3 |
| 4405 | Status, coded | C an..3 |
| | | |
| C516 | MONETARY AMOUNT | C |
| 5025 | Monetary amount type qualifier | M an..3 |
| 5004 | Monetary amount | C n..18 |
| 6345 | Currency, coded | C an..3 |
| 6343 | Currency qualifier | C an..3 |
| 4405 | Status, coded | C an..3 |
| | | |
| C516 | MONETARY AMOUNT | C |
| 5025 | Monetary amount type qualifier | M an..3 |
| 5004 | Monetary amount | C n..18 |
| 6345 | Currency, coded | C an..3 |
| 6343 | Currency qualifier | C an..3 |
| 4405 | Status, coded | C an..3 |
| | | |
| C516 | MONETARY AMOUNT | C |
| 5025 | Monetary amount type qualifier | M an..3 |
| 5004 | Monetary amount | C n..18 |
| 6345 | Currency, coded | C an..3 |
| 6343 | Currency qualifier | C an..3 |
| 4405 | Status, coded | C an..3 |

FIGURE 6. EDIFACT Data Segment Definition
(From Standard data segments directory (EDSD))

```

UNH segment'
    first data segment'
        ...
    n-th data segment'
UNT segment'

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Notes:

UNH segment = Message Header segment
UNT segment = Message Trailer segment
Segment Separator (i.e., terminator) is an apostrophe (')

Indentation and separation into lines have been added for readability only.

FIGURE 7. EDIFACT message structure

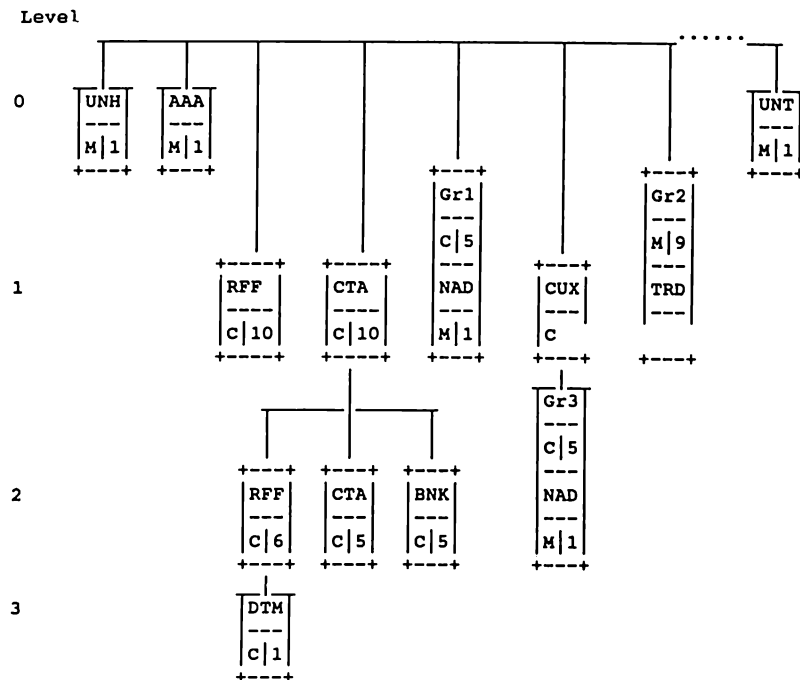


FIGURE 8. EDIFACT Branching Diagram (adapted from UNTDID)

Legend: * Changed in relation to EDMD issue 90.1
 + Added in relation to EDMD issue 90.1

- + CREADV Credit advice
- + CREEXT Extended credit advice
- + CUSCAR Customs cargo report
- + CUSDEC Customs declaration
- + CUSREP Customs conveyance report
- + CUSRES Customs response
- + DEBADV Debit advice
- + IFTMAN Arrival notice
- + IFTMBC Booking confirmation
- + IFTMBF Firm booking
- + IFTMBP Provisional booking
- + IFTMCS Instruction contract status
- + IFTMIN Instruction message
- * INVOIC Invoice message
- * ORDERS Purchase order message
- + PAYEXT Extended payment order
- + PAYORD Payment order
- + REMADV Remittance advice

FIGURE 9. List of UN Standard Messages (UNSM)
 (From UN Standard Message Types Directory--EDMD [6])

| Numerical Code | Name | CEDEX Code | EDIFACT Code |
|----------------|----------------------|------------|--------------|
| 01010 | On-hire interchange | ON | ONHIRI |
| 01020 | Off-hire interchange | OF | OFHIRI |
| 01030 | Interchange | IN | INTERC |
| 01040 | Damage description | DD | DDESCR |
| 01050 | Work estimate | WE | WESTIM |
| 01060 | Third party claim | WC | WCLAIM |
| 01070 | Work tender request | WR | WREQUE |
| 01080 | Work order | WO | WORDER |
| 01090 | Work cost invoice | WI | WINVOI |

FIGURE 10. Message types for "Container Equipment Data Exchange" (CEDEX) standard [11]

| | | |
|--------------------------|-----|-------------|
| Service String Advice | UNA | Conditional |
| Interchange Header | UNB | Mandatory |
| Functional Group Header | UNG | Conditional |
| Message Header | UNH | Mandatory |
| User Data Segments | | As required |
| Message Trailer | UNT | Mandatory |
| Functional Group Trailer | UNE | Conditional |
| Interchange Trailer | UNZ | Mandatory |

FIGURE 11. Structure of an EDIFACT Interchange [6]

```
UNB+UNO:1+CONFERN:CONFABT1+REPAIR:REPAIRABT2+870510+7/2345'
UNH+5645673+DDESCR:1'RFF+MCP+87/508+890221:1430'CUX+USD'
EQF+CN+ABXU:0012343'NAD+ED+xyzmr1234:IB'NAD+ER+xyzzr1234:IB'
DAM+RB1N+TFA+BT+SC'DAM+RT1N+ROB+BR+SG'TAD+ztrxx1234:IB'
UNT+10+5645673'UNZ+1+7/2345'
```

FIGURE 12. A CEDEX Message Using the EDIFACT Format (From [11])