

Proposal for XML/EDI Basic Structure

Source : JIPDEC-CII (Japan Information Processing Development Center

– Center for the Informatization of Industry)

Status : Contribution to ebXML – Core Component Team

Date : 25th January, 2000

Proposal for XML/EDI Basic Structure

By JIPDEC

January 25, 2000

It is not clear whether the next-generation EDI will require a message as a concept. Judging from past experience, however, a message will still be necessary as a unit. So for XML/EDI, too, the message format is the most important component. We propose the following message structure for XML/EDI.

(1) Basic message structure

The message should be composed of a series of data items and contain a repeat structure comprising multiple data items. That is, the message will be composed of a group of data items.

(2) Repeat structure

The repeat structure shall allow one repetition, and contain another repeat structure.

(3) XML tag

Each data item will have a unique tag.

(4) Data item and tag

The data item shall be a specific data element. A specific data element means a BSU (basic semantic unit) in the BSR (basic semantic register) or a data element defined in ISO 11179.

- One unique XML tag will be assigned to one specific data element, which will assure that there is conformity with user systems in CPU to CPU EDI.

- The specific data elements to be used for XML/EDI should be internationally registered, and international registration should conform to ISO 11179.

For practical management of the elements, however, the registration systems operating locally in each country or area should be utilized. An internationally-integrated registration system will inevitably lead to unfavorable responses and to organizational rigidity.

The registration itself should demonstrate flexibility. Duplicate registration of specific data elements with the same meaning will not lead to fatal errors. But assigning the same identifier (XML tag) to multiple specific data elements that have different meanings should be avoided.

- The XML tags should not be meaningful identifiers. They should be meaningless (such as numbers) and be useful for managing the specific data elements.

For use with a browser, a style sheet will enable meaningful headings to be attached. It is therefore not necessary to assign meaningful identifiers to XML tags.

The unique tag number for a CII data item, which will be described later, represents the industry that has developed that data item. In Japan, "JP" is added to the number for an XML tag. This represents that the data item is a specific data element defined in Japan.

(5) Necessity for a simple standard

The standard for XML/EDI should be as simple as possible. Complicated standards will hinder the establishment of inexpensive systems and the introduction of XML/EDI by medium- and small-sized enterprises.

The traditional UN/EDIFACT and X12 standards will meet the needs for EDI requiring complicated messages.

By adopting proposals (1) and (2) described above, all of the message structures used for the existing UN/EDIFACT or X12 standard messages can be utilized. We proposed (3) and (4) for the following reasons. It is clear from past experience gained in Japan that the adoption of the proposals will facilitate the message design and will improve the conformity with applications within users' systems. Proposal (5) is important to popularize XML/EDI.

For reference, the following paragraphs describe the CII Standard and the XML/EDI that is currently under development based on the CII Standard.

REFERENCE

1. Outline of the CII Standard

(1) History of the CII Standard

The CII Standard is a standard for EDI that was developed by JIPDEC-CII in 1991. The standard is comprised of the following four elements.

- CII syntax rule
- Standard message based on industrial sector
- CII data item
- Standard code set

6,000 companies have already adopted the CII Standard in Japan, and have been made to introduce the standard into Southeast Asia.

The CII syntax rule is a rule for composing EDI messages. In April 1999, the rule was incorporated into the JIS (Japanese Industrial Standards) as JIS X-7012. EDIFACT-V4 has also been incorporated into Japanese standards as JIS X-7011.

Standard messages are established separately by each industry. Presently 20 industries have standardized their messages, and new messages are currently under development.

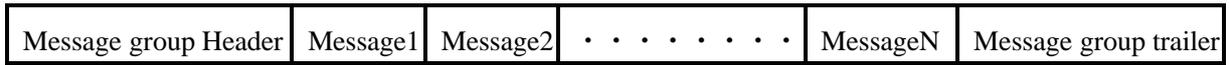
CII data items are data items common to all industries, and unique tag numbers are assigned to them.

Standard code sets are common code sets used as values for CII data items. Some are for all industries and others are established separately for each industry.

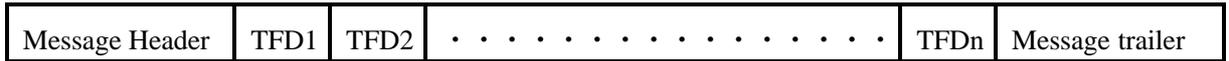
(2) Outline of the CII syntax rule

Based on the CII syntax rule, a CII data item is stored in a box called a TFD. A message is composed of a group of required TFDs.

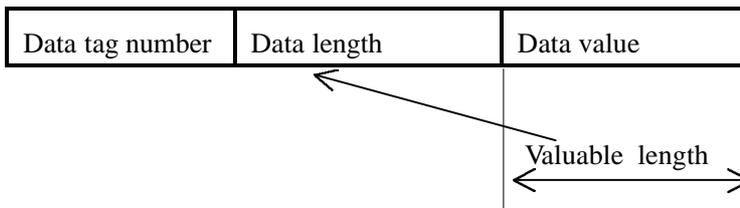
One TFD contains one CII data item. For identification, each TFD has a data tag number, for which the unique tag number that was assigned when the CII data item was defined is utilized.



Message group Structure



Message Structure



TFD : Transfer Form Data element

TFD Structure

fig-1 CII Standard basic structure

2. CII data item and atomic object

(1) CII data item

The CII data item is equivalent to a BSU in the BSR, and its meaning is almost identical to the data element defined in ISO 11179. CII data items, however, are actually developed based on past experience and there may be some cases in which they do not conform to ISO 11179.

In addition, although the CII data item is a standard common to all industries, actual development of the items is being done separately by each industry. This sometimes results in duplicate definitions.

Compared with UN/EDIFACT generic data elements, CII data items can be said to be specific data elements.

About 10,000 CII data items have already been developed, and development work is still under way. Presently CII data items are utilized as a domestic standard within Japan, and maintaining the validity of the standard at the international level is posing serious problems.

(2) Standard code set

The standard code set is equivalent to an atomic object in the object-oriented approach. The relationship is described in Fig-2.

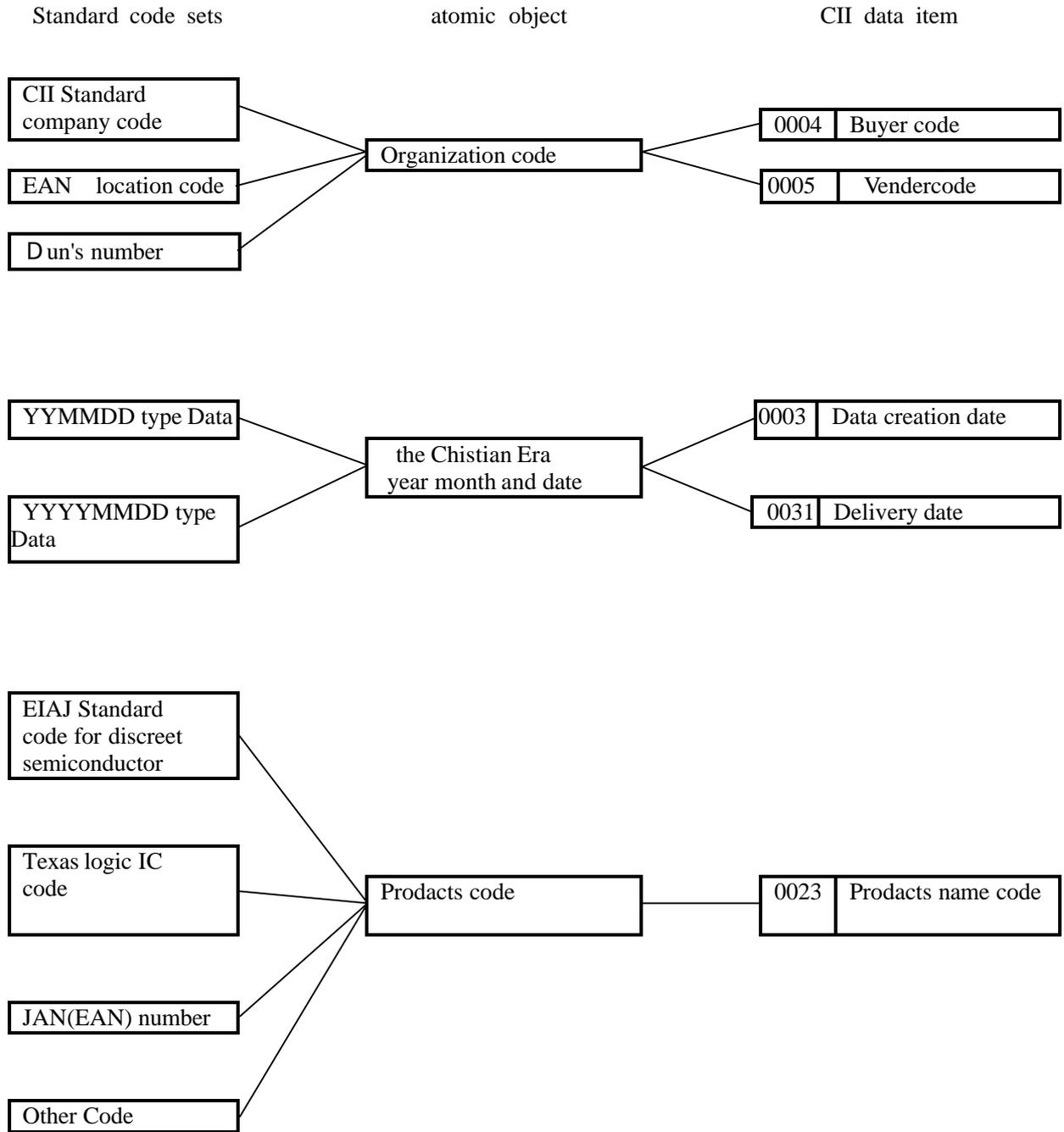


Fig-2 Standard code sets, atomic object and CII data item

Sample of BSU List

CII tag number	BSU name	Data Type	Using Industries				
			EIAJ	FEPC	JPCA	JISI	JTRN
00004	Buyer code (organization + section)	X(12)	00004	00004		07354	00004
03011	Buyer code (organization)	X(6)			03011		
03012	Buyer code (section)	X(6)			03012		
00006	Purchase section code	X(8)	00006			07336	
07355	Buyer name	X(35)				07355	
00184	(for domestic) Purchase section name	X(20)	00184				
00801	(for inter-national) Purchase section name	X(35)	00801				
03111	End user organization code	X(6)			03111		
03112	End use section code	X(6)			03112		
07025	End user code (organization + section)	X(12)				07025	
00151	End user name	X(20)	00151		03113	07026	
03114	End user name (Japanese Kanji)	K(40)			03114	07021	

EIAJ : Electronics equipment industry

FEPC : Electric Power industry

JPCA : Japan Petro-chemical industry

JISI : Japan iron steel industry

JTRN : Japan Logistics

3. Message

- A message is equivalent to a slip in a paper system and is similar to the UN/EDIFACT standard message (UNSM) in significance.

- CII messages are all developed separately by each industry and there are no full sets unlike with UNSM.

- The CII message is developed as a group of TFDs (CII data items) and there is a rule that a change in the order of TFDs will not change the meaning of the message.

A sample of message

Message format No.	Association name	Sub-association name	Information identifier code	Version
	EIAJ	01	4401	2F

Purchase order

Item no.	Item name	Contents of item	Data type (No. of digits)	Repetition
00001	Data Processing No.	No. Showing in what order receiver will process data. Receiver will process data in the order of this No. , so follow data record creating method given in this publication for method of determining order.	9(5)	
00002	Information identifier code	Code showing type of information. (Purchase order =4401)	X(4)	
00003	Data creation date	The date on which the data was created.	9(6)	
00004	Buyer code	Code representing the company placing purchase order (6 digits) and factory, office, Vender code, sales section, etc., using unified corporate code.	X(12)	
00005	Vender code	Code representing the company receiving purchase order (6 digits) and sales office, section, etc., using unified corporate code.	X(12)	
00801	Purchase section name	Buyer section name representing section responsible for prime cost or section receiving delivery.	X(35)	
00802	Order receiving section name	Name representing section receiving purchase orders.	X(35)	
00803	Quotation documents No.	Control No. quoter gives to quotation document received by buyer for purchase order.	X(23)	
00007	Purchase order No.	Control No. Attached to purchase order information by buyer. It must be unique.	X(23)	
00008	Production No.	Production control No., of ordered product, relation to cost management etc.	X(19)	
00009	Correction code	Code showing whether information is new, altered, or retracted.	X(1)	
00011	Purchase order issued date	Date on which that purchases order was issued.	9(6)	

4. Outline of the CII base XML/EDI

(1) History of the CII base XML/EDI

The CII base XML/EDI is a new system that is currently under development to provide smaller businesses with inexpensive EDI systems making use of the Internet and Internet-related tools.

The development of the CII base XML/EDI has been promoted to meet the first prerequisite to make it possible to utilize all the properties of the CII Standard in common. Specifically, the CII syntax rule will be replaced by the XML rule, but the standard messages, CII data items and standard code sets will be used as they are in principle.

(2) Message structure of the CII base XML/EDI

The message structure established under the CII syntax rule will be utilized as it is.

(3) Tags in CII base XML/EDI

CII data items have unique tag numbers, which will be used as they are as XML tags. The tag numbers, however, are simple numbers and “JP” will be added to the head of the tags.

According to the CII syntax rule, one CII data item will be stored in one XML identifying unit.

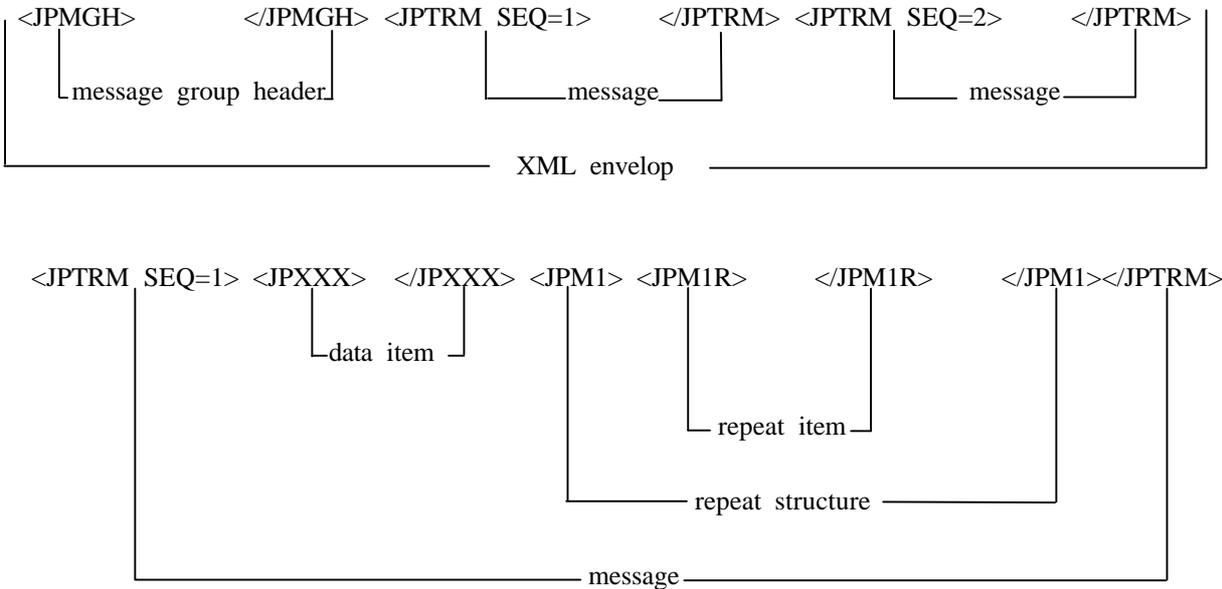


Fig-3 Basic structure of CII base XML/EDI

(4) Characteristics of the CII base XML/EDI

- The CII syntax rule base EDI message and the CII base XML/EDI message will be completely compatible and be mutually and easily convertible.
- For the CII base XML/EDI message, the content can be directly seen using a multipurpose browser if a style sheet is prepared. (For this, however, the message group should be composed of one message.)
- All of the XML functions may be utilized for the EDI system.
- XML DTD will not be utilized.
- The CII syntax rule base EDI and the CII base XML/EDI can be operated in parallel.

5. Example of XML/EDI Message (Based on CII rule)

```
<?xml version="1.0" encoding="Shift_JIS" ?>
<?xml-stylesheet href="EIAJXSL2.xsl" type="text/xsl" ?>
<!DOCTYPE CII-EIAJ012E0502-V10 SYSTEM "EIAJ012E0502.dtd">
<CII-EIAJ012E0502-V10>
<JPMGH>
  <JPC03>0</JPC03>
  <JPC04></JPC04>
  <JPC07></JPC07>
  <JPC10>EIAJ</JPC10>
  <JPC11>01</JPC11>
  <JPC12>2E</JPC12>
  <JPC14>0502</JPC14>
  <JPC19>981001154328</JPC19>
  <JPC21>CII300</JPC21>
</JPMGH>
<JPTRM SEQ="00001">
  <JP00001>00493</JP00001>
  <JP00002>0502</JP00002>
  <JP00003>981110</JP00003>
  <JP00004>108420171000</JP00004>
  <JP00005>999999999999</JP00005>
  <JP00007>S761MFUG835</JP00007>
  <JP00011>981001</JP00011>
  <JP00012>PC</JP00012>
  <JP00013>35000</JP00013>
  <JP00014>1</JP00014>
  <JP00015>610000</JP00015>
  <JP00016>21350</JP00016>
  <JP00018>E9</JP00018>
  <JP00019>JIS C5141C16EL (Z) 100</JP00019>
  <JP00020>1</JP00020>
  <JP00022>アルミテ ンカイコシ 16VDC 100 マイクロ +-20%</JP00022>
  <JP00024>532QD01</JP00024>
  <JPM001>
    <JPM001R IDX="001">
```

<JP00031>981205</JP00031>

<JP00032>300000</JP00032>

<JP00034>5X38-99</JP00034>

<JP00179>AM</JP00179>

</JPM001R>

<JPM001R IDX="002">

<JP00031>981220</JP00031>

<JP00032>310000</JP00032>

<JP00034>5Z36-99</JP00034>

<JP00179>PM</JP00179>

</JPM001R>

</JPM001>

<JP00055>E コウキ ョウ</JP00055>

<JP00056>S761MF001UG835A10</JP00056>

<JP00057>2</JP00057>

<JP00059>1</JP00059>

<JP00263>このデータは架空のものです。</JP00263>

</JPTRM>

</C11-EIAJ012E0502-V10>