Visualization of EDI messages: Facing the problems in the use of XML

Reija Korhonen & Airi Salminen
University of Jyväskylä

http://www.cs.jyu.fi/~airi/

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Outline

1. Traditional EDI
2. Business goes to the Internet
3. Visualization of XML data
4. Visualization in business networks
5. A visualization service
6. Summary
1. Traditional EDI

**EDI = Electronic Data Interchange**

![Diagram showing the process of EDI between two companies](image.png)

**APPLICATION IN COMPANY A**

**APPLICATION IN COMPANY B**

**EDI message**
1. Traditional EDI

EDI = Electronic Data Interchange

APPLICATION IN
COMPANY A

APPLICATION IN
COMPANY B

Translator

Translator

Application

Application

EDIFACT

ANC X12

Intermediate
language
1. Traditional EDI

**EDIFACT message**

UNH+12345+INVOIC:D:96A:UN:DAV050'
BGM+380+X2245'
DTM+137:20002114:102'
RFF+CR:974711-CBA/Z'
NAD+SE+664500024450'
FII+BY+23456'
CTA+PD+:Aila Ahomansikka'
...

...
2. Business goes to the Internet

Needs in the Internet environment

- strong support for data integration
- flexibility in standards and standardization
- notations suitable both for computers and people
- support for the variety of the natural languages of the world
- separation of content and external representation
2. Business goes to the Internet

**XML**

- Common, widely known basis; supports data integration, simplifies writing translators and standardization processes
- Possible to define special languages needed on special domains; human readable, meaningful vocabularies (element and attribute names) and hierarchic structures tailored for the domains
2. Business goes to the Internet

XML

- The character code intended for all natural languages of the world, regardless of character set, orientation of script, etc.
- A variety of XML-related specifications (XML Names, XML Schema, Canonical XML, XSLT...) available to be used both for developing special standards and for processing XML data
2. Business goes to the Internet

**XML**

- Different levels of standardization possible: vocabulary only, vocabulary with constraints on the structure (DTD), vocabulary with constraints on the structure and data types (XML Schema)
- Possibility for a clear separation of structure, content and external representation; standardized languages for specifying the external representation (CSS, XSL)
2. Business goes to the Internet

XML-related initiatives for business data

- ebXML
- cXML (Commerce XML Resources)
- eBIS-XML (the Electronic Business Interchange Standard)
- xCBL (XML Common Business Library)

to standardize business messages, processes, architectures, semantics, and integration of business objects in varying formats
3. Visualization of XML documents

```xml
<InvoiceDetails>
  <InvoiceTypeCode>INV01</InvoiceTypeCode>
  <InvoiceTypeText>INVOICE</InvoiceTypeText>
  <OriginCode>Origin</OriginCode>
  <InvoiceNumber>01034</InvoiceNumber>
  <InvoiceDate Format="CCYYMMDD">20030630</InvoiceDate>
  <InvoiceTotalVatExcludedAmount
    AmountCurrencyIdentifier="EUR">
    250,00
  </InvoiceTotalVatExcludedAmount>
  <InvoiceTotalVatAmount AmountCurrencyIdentifier="EUR">
    55,00
  </InvoiceTotalVatAmount>
  <InvoiceTotalVatIncludedAmount
    AmountCurrencyIdentifier="EUR">
    305,00
  </InvoiceTotalVatIncludedAmount>
</InvoiceDetails>
```

**INVOICE**

- Invoice Number: 01034
- Invoice Date: 30.06.03
- Annotation time: 8 days
- Sum (VAT 0): 250,00
- VAT: 55,00
- Total: 305,00 EUR
Alternatives for visualization

- tagged text
- without tags

  - layout specified in the tags (e.g. HTML)
  - separate specification for the layout; either by a style sheet (CSS, XSL) or by some other transformation specification
4. Visualization in business networks

Alternatives for visualization

- plain EDI transfer
- double transfer
- EDI with style sheets
- visualization by a third party
4. Visualization in business networks

plain EDI transfer

Enterprise A  -->  Enterprise B

Enterprise C

EDI message data
4. Visualization in business networks

double transfer

Enterprise A

Enterprise B

Enterprise C

EDI message data

the content data of the EDI message in its external representation
4. Visualization in business networks

EDI with style sheets

Enterprise A

Enterprise B

Enterprise C

EDI message

style sheet data
4. Visualization in business networks

visualization by a third party
4. Visualization in business networks

plain EDI transfer

Possible problems

- Multiple work
- Varying visualizations of the same business information
4. Visualization in business networks

**double transfer**

Possible problems:
- Redundancy
- Possibility for inconsistencies

Diagram:

- Enterprise A
- Enterprise B
- Enterprise C

Arrows indicate EDI message data and the content data of the EDI message in its external representation.
4. Visualization in business networks

EDI with style sheets

Possible problems

- Style sheet support needed in the applications
- Maintenance and management of style sheets

- Style sheet data
- EDI message data
- style sheet data
4. Visualization in business networks

**visualization by a third party**

**Possible problems**

- Scalability
- Efforts needed for maintaining the visualization data, for example, style sheets
5. A visualization service

- evolving EDI standards
- evolving partnerships
- evolving organizations
- evolving software
- evolving regulations

Changes on any of the areas may cause needs to change the visual representation of the information in an EDI message.
5. A visualization service

Interactive visualization service

- set of superior standards
- a master style sheet for each superior standard
5. A visualization service

Diagram:

- Enterprise A
  - User
  - Application

- Superior standard
  - Visualization service

- Enterprise B
  - User
  - Application

- Enterprise C
  - User
  - Application

箭头表示流程和通信关系，包括EDI消息流和与可视化相关的通信。
5. A visualization service
6. Summary

• There is a number of XML-based standardization initiatives concerning business messages, processes, architectures, semantics, and integration of business objects in varying formats. The external representation of messages is outside the standardization activities.

• XSL offers a base for a standard format for specifying the visual presentation. Non-systematic ways to use XSL however cause problems in complex evolving EDI networks

• We have proposed a third party visualization service with superior standards and master style sheets