

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

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**<http://www.cs.jyu.fi/~airi/>**

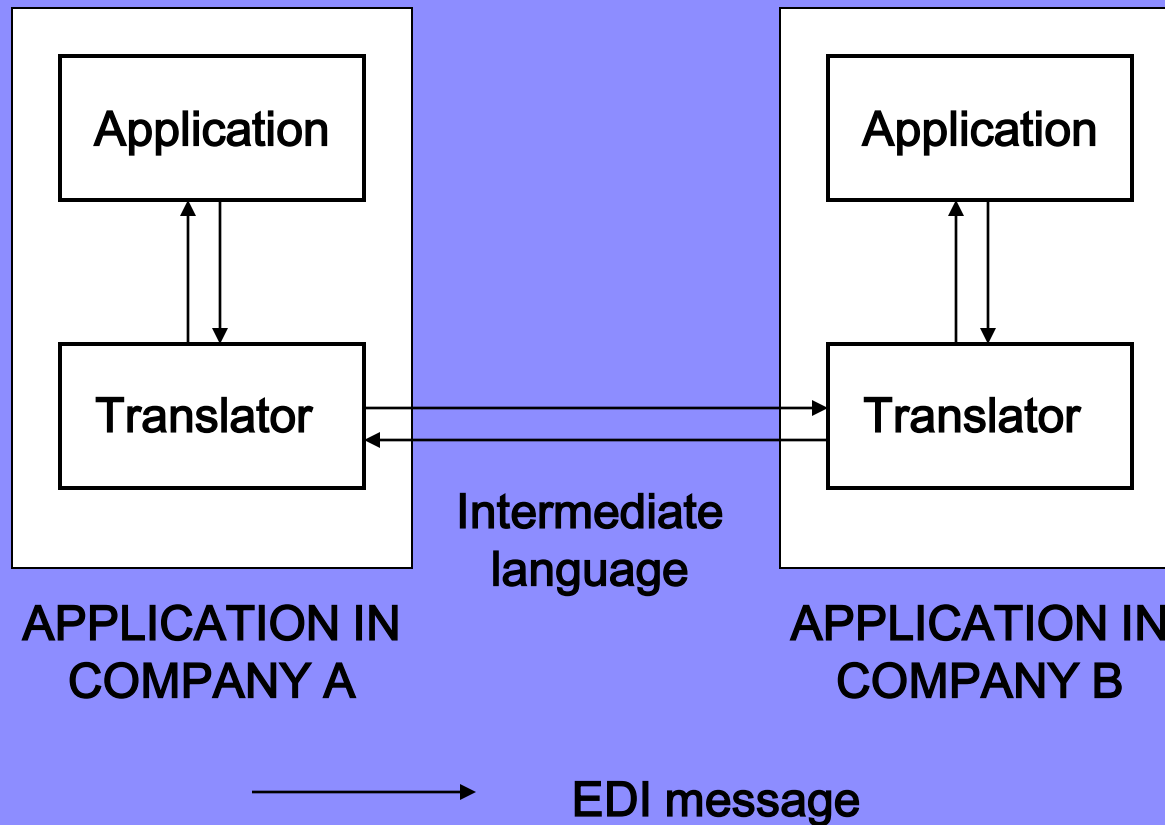
**ICEC 2003  
Fifth International Conference on Electronic Commerce  
Pittsburgh, Sept. 30 - Oct. 3, 2003**

# 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**

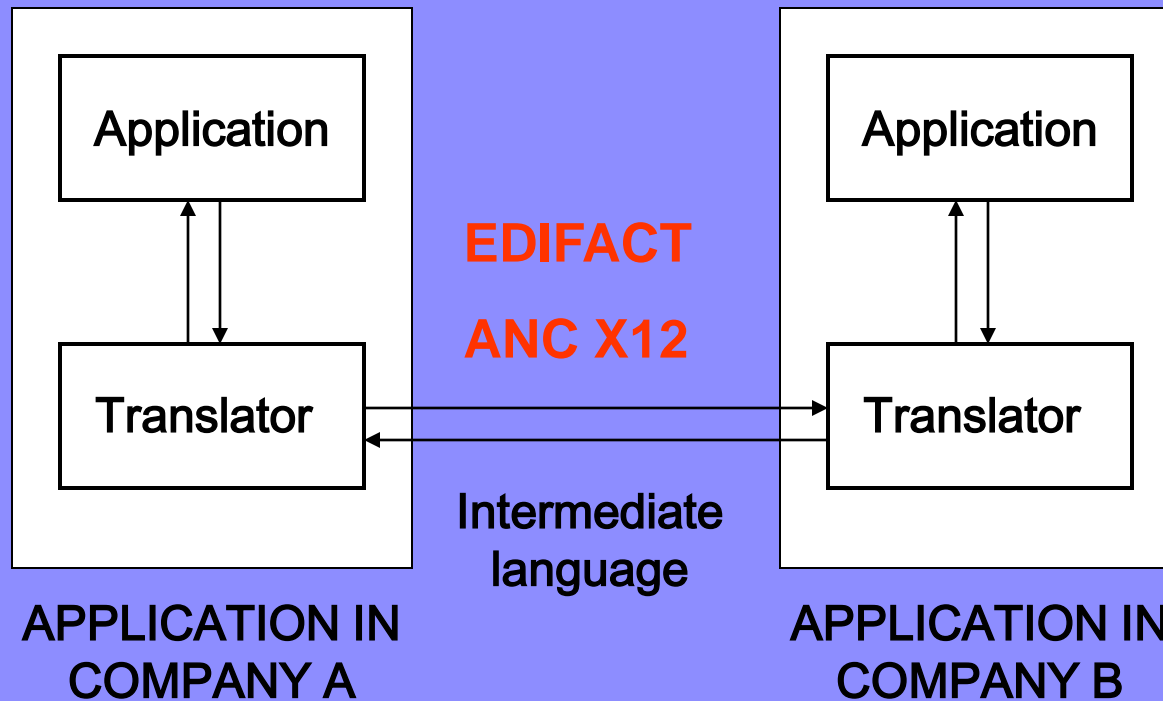
# 1. Traditional EDI

**EDI = Electronic Data Interchange**



# 1. Traditional EDI

**EDI = Electronic Data Interchange**



# 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+6645000024450'**

**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

```
<InvoiceDetails>
  <InvoiceNumber>01034</InvoiceNumber>
  <InvoiceDate Format ="CCYYMMDD">20030630</InvoiceDate>
  <InvoiceTotalVatExcludedAmount CurrencyIdentifier="EUR">
    250.00
  </InvoiceTotalVatExcludedAmount >
  <InvoiceTotalVatAmount CurrencyIdentifier="EUR">
    55.00
  </InvoiceTotalVatAmount >
  <InvoiceTotalVatIncludedAmount CurrencyIdentifier="EUR">
    305.00
  </InvoiceTotalVatIncludedAmount >
</InvoiceDetails>
```

## 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

```
<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>
  <InvoiceTotalVatIncluded
    AmountCurrencyIdentifier="EUR">
    305,00
  </InvoiceTotalVatIncluded>
</InvoiceDetails>
```

## INVOICE

Invoice Number	01034
Invoice Date	30.06.03
Annotation time	8 days

Sum (VAT 0)	250,00
VAT	55,00

<b>Total</b>	<b>305,00 EUR</b>
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## Alternatives for visualization

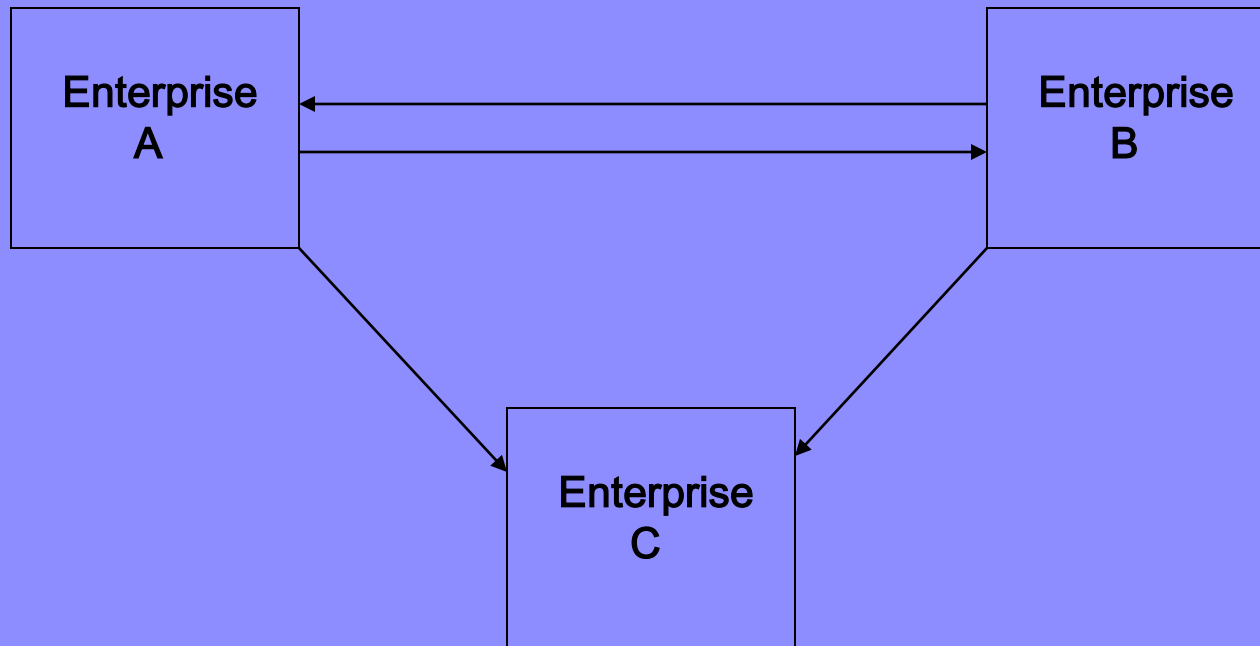
- ▶ tagged text
- ▶ without tags
  - layout specified in the tags (e.g. HTML)
  - separate specification for the layout; either by a style sheet (CSS, XSL) or by some other transformation specification

### **Alternatives for visualization**

- ▶ plain EDI transfer
- ▶ double transfer
- ▶ EDI with style sheets
- ▶ visualization by a third party

## 4. Visualization in business networks

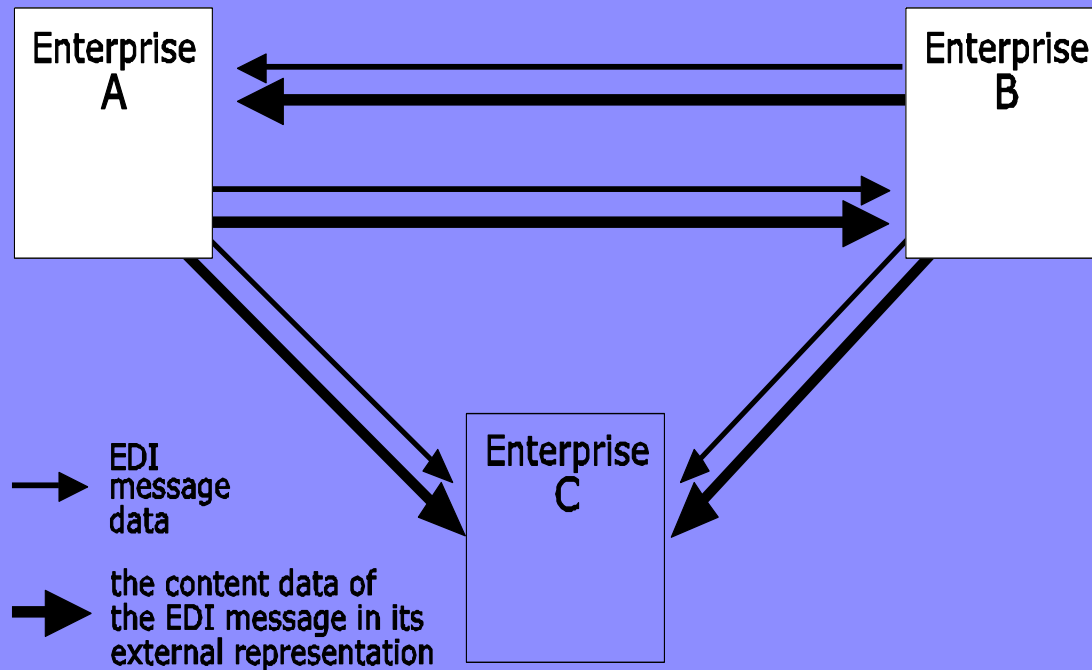
### plain EDI transfer



—————> EDI message data

## 4. Visualization in business networks

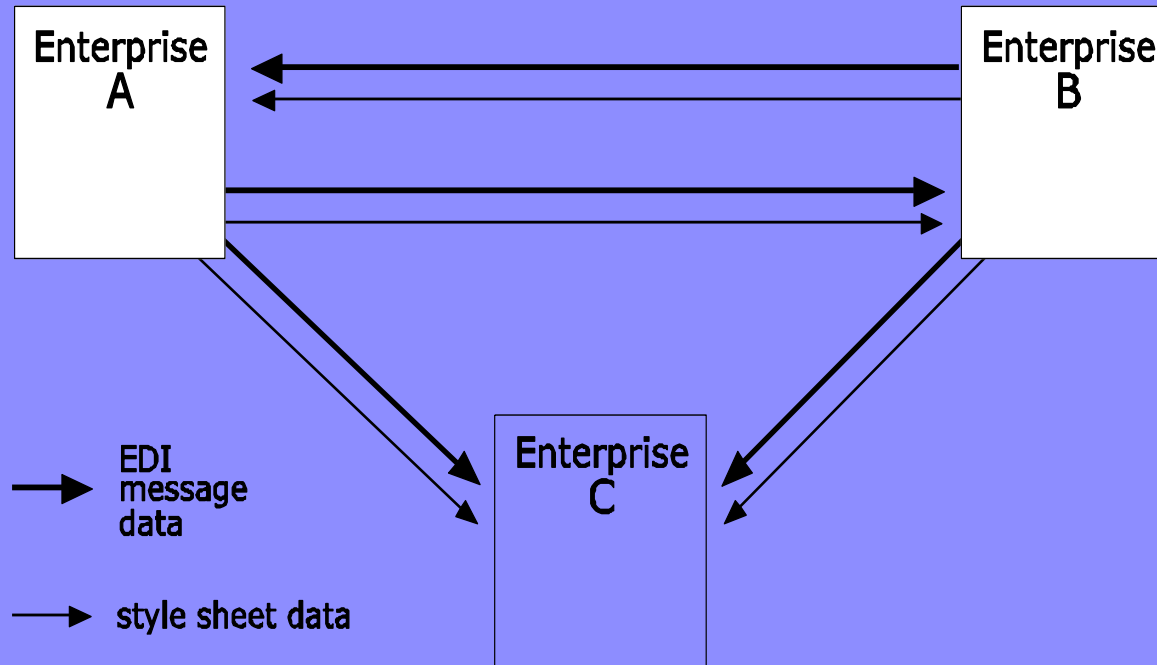
### double transfer





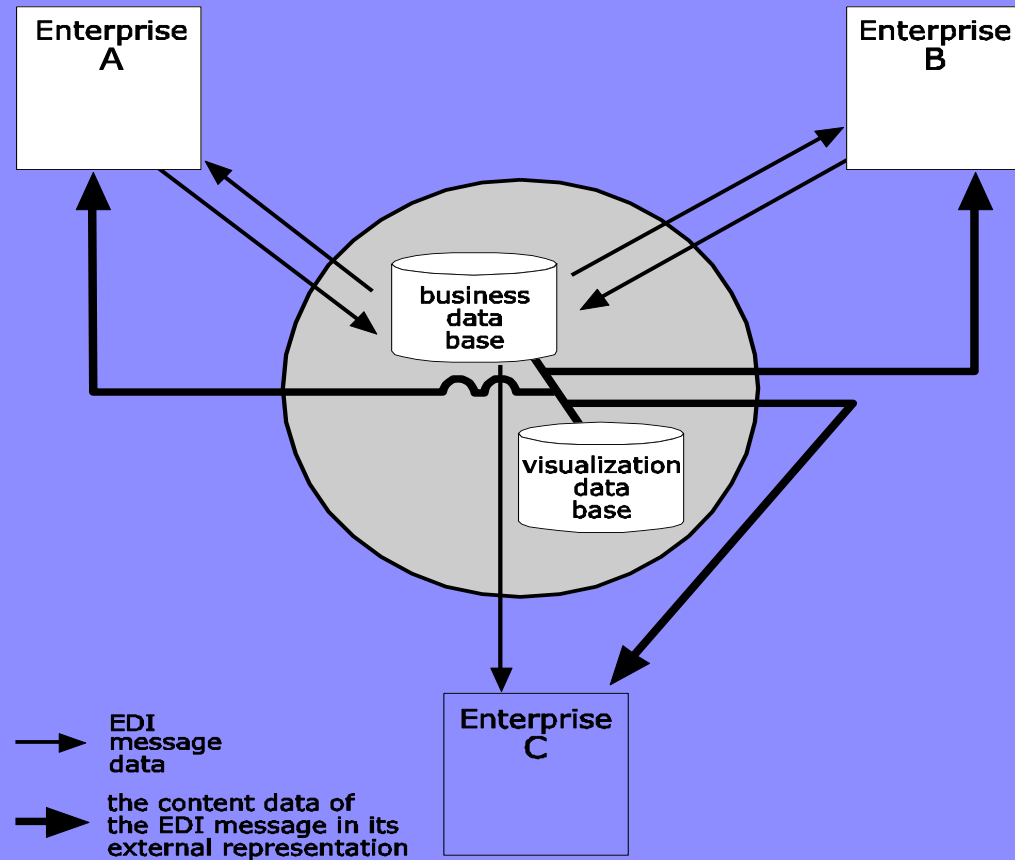
## 4. Visualization in business networks

### EDI with style sheets



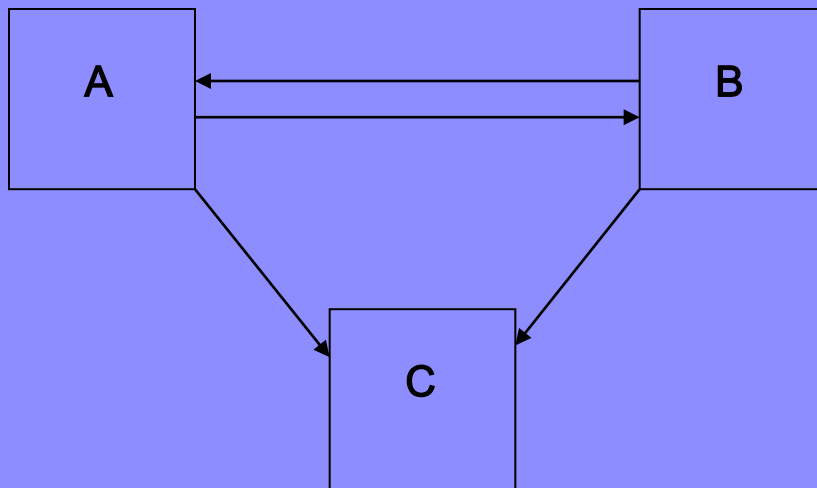
## 4. Visualization in business networks

### visualization by a third party



## 4. Visualization in business networks

### plain EDI transfer

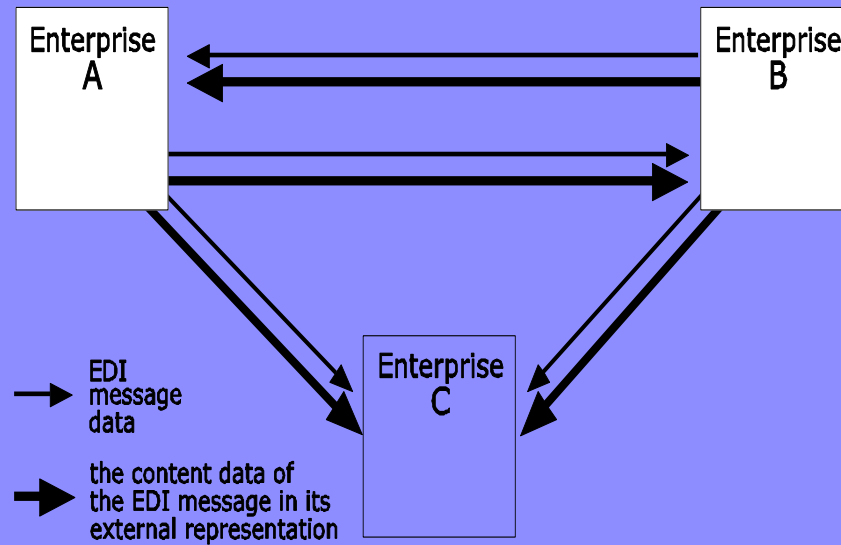


### Possible problems

- ▶ Multiple work
- ▶ Varying visualizations of the same business information

## 4. Visualization in business networks

### double transfer

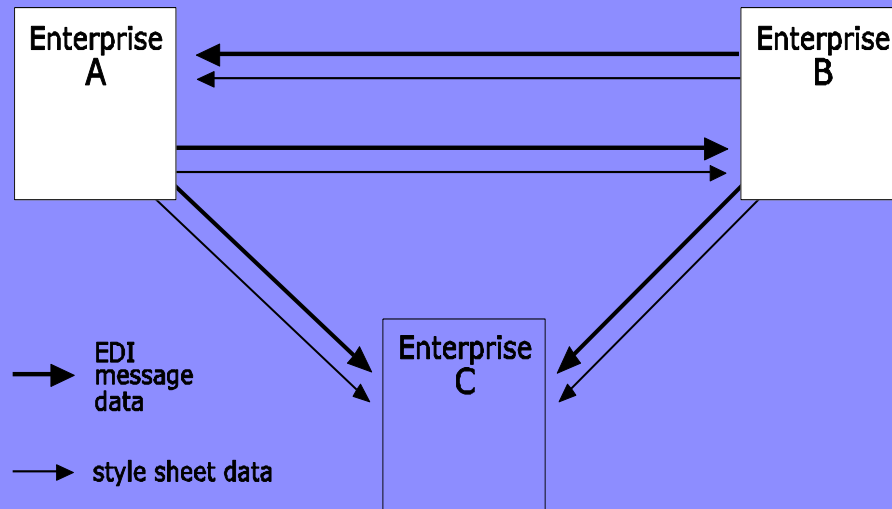


### Possible problems

- ▶ Redundancy
- ▶ Possibility for inconsistencies

## 4. Visualization in business networks

### EDI with style sheets

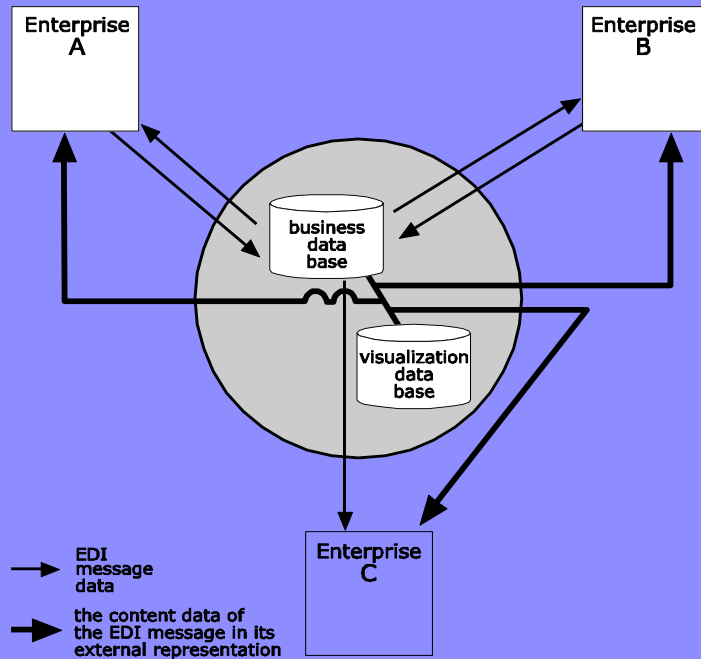


### Possible problems

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

## 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.**

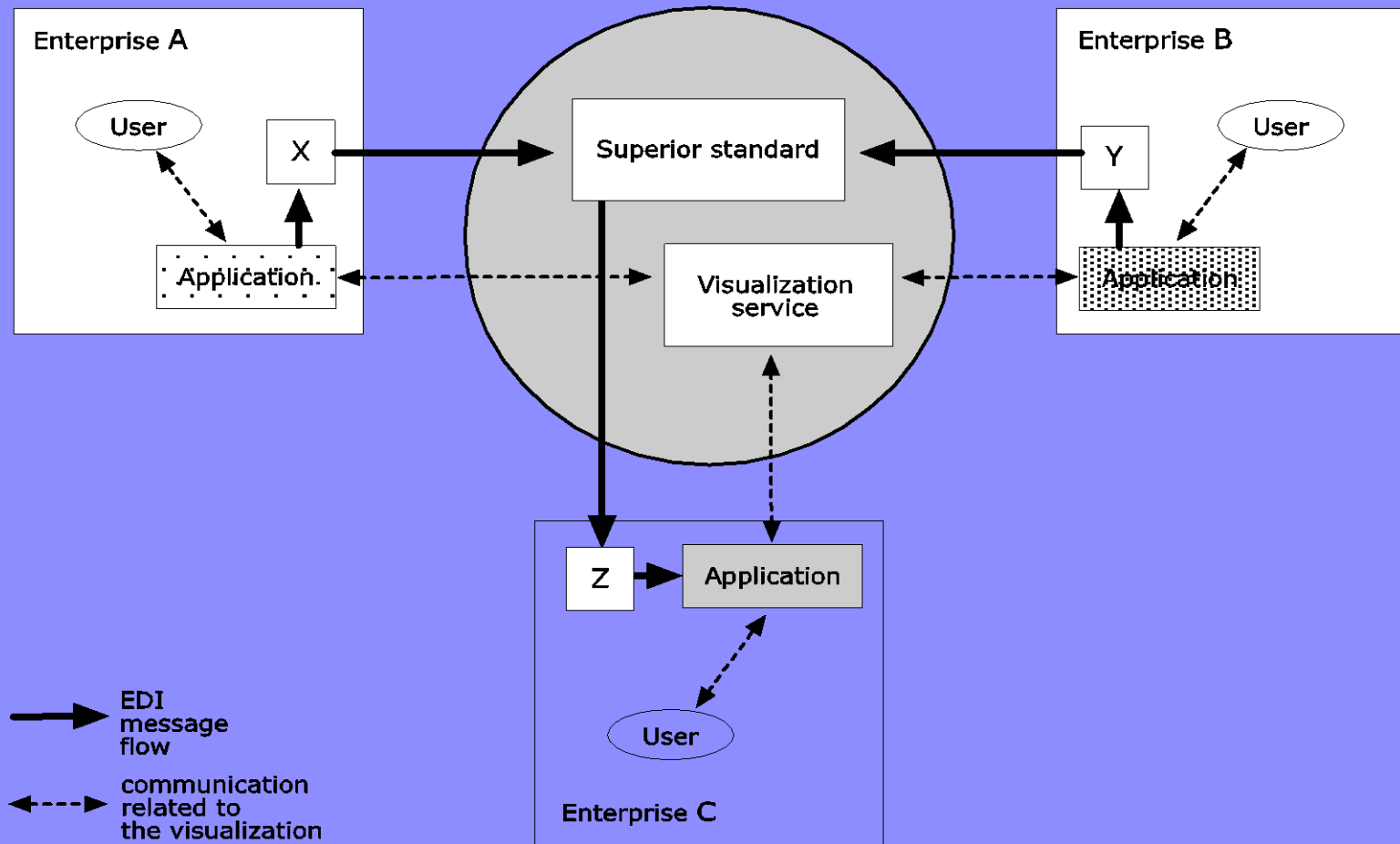
## 5. A visualization service

### Interactive visualization service


- ▶ set of superior standards
- ▶ a master style sheet for each superior standard



## 5. A visualization service



# 5. A visualization service



**INVOICE**  
 Invoice Date: 15.07.2003  
 Invoice Number: 706198  
 Customer ID: 859522

Our Reference: Our Responsible: Adam Accounter  
 Your Reference: Your Responsible: Owen Orderer

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Billing Address: exAMPLE Ltd., P.O. Box 1, 00001 SAMPLE CITY  
 Delivery Address: Junior exAMPLE Ltd., 71 Example Street, 00001 SAMPLE CITY

**Terms of Payment**  
 14 days net  
 Due Date: 29.07.2003  
 Interest on Delayed Payments: 11.50 %  
 Annotation time: 8 days


Bankers		Rows Total	VAT 0	VAT Inc.
BANK	123456-12345	601.80	601.80	EUR
Due Date	29.07.2003	Insurance	0.00	EUR
Reference Number	859522706198204	Rounding	0.01	0.01 EUR
		TOTAL	734.20	EUR
		VAT	132.41	EUR
		<b>PAYABLE</b>	<b>734.20</b>	<b>734.20 EUR</b>

**Virtual bar code: 122811800068219000734200000085952270619820401020800008**

VAT	According	%	Amount
	601.83	22.00 %	132.41
			VAT Total 132.41

Description	Quantity	Unit	Price per Unit	VAT %	VAT	Total
			VAT 0			VAT 0
NOTE 802680	180		601.80000	22.00	132.41	601.80

NOTE 802680  
 Date: 11.06.2003



**HYVITYSLASKU**  
 Päivämäärä: 03.07.2003  
 Laskunro: 7000016  
 Asiakasno:

Viitteemme: Käsitteijämme  
 Viitteenne: Käsitteijänne  
 Liput 15.6.2003

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Laskutusosoite:  
 esim Oyj  
 PL 1010  
 01001 HELSINKI

**Maksuehdot**

Eräpäivä	Viivästyskorko	Huomautusaika
		8 vrk

Pankkiyhteys		ALV 0	Sis.ALV
PANKKI	225577-668822	-12.61	EUR
Eräpäivä		0.00	0.00 EUR
Viitenumero			
YHTEENSÄ			-15.38 EUR
ALV		-2.77	EUR
MAKSETTAVA		<b>-15.38</b>	<b>-15.38 EUR</b>

ALV	Peruste	%	Summa
	-12.61	22 %	-2.77
			ALV yhteensä -2.77

Hyvitettävä: 7000001  
 Maksetaan tilille PANKKINNE 223318-190023

Selite	Määrä	A-hinta	ALV %	ALV	Yhteensä
		ALV 0			ALV 0
		12.61410	22.00	-2.77	-12.61

## 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**