

Real and Effective Use of Business Vocabularies

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UN/CEFACT ATG2 Editor
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DIN NBue Chair

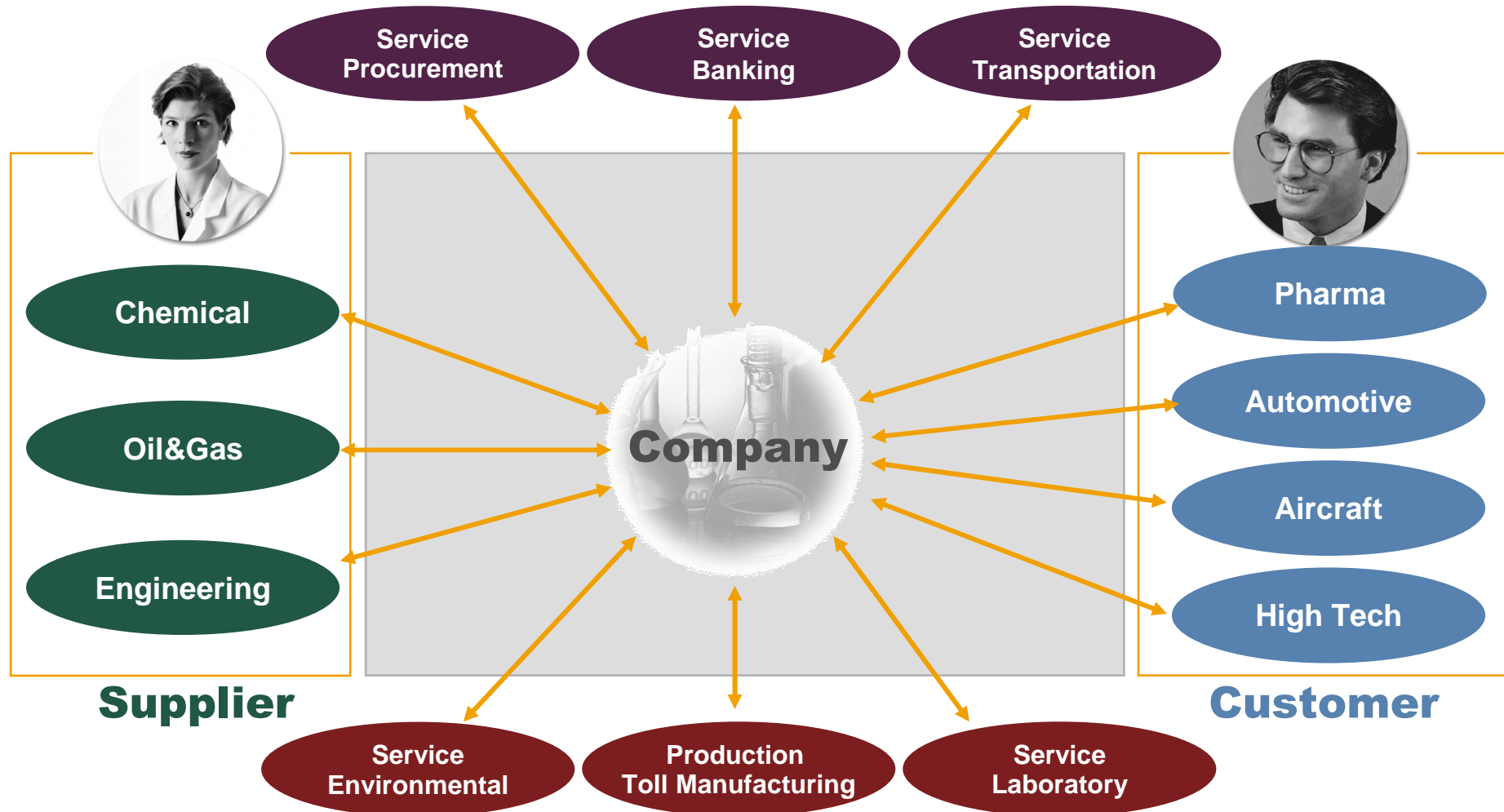
General Aspects

Semantics & Core Components

SAP NetWeaver & Core Components

Implementation Example

Vision: Enable Cross-Industry Collaboration



Unlock value across industries by implementing open standards

↔ **intensive collaboration between partners**

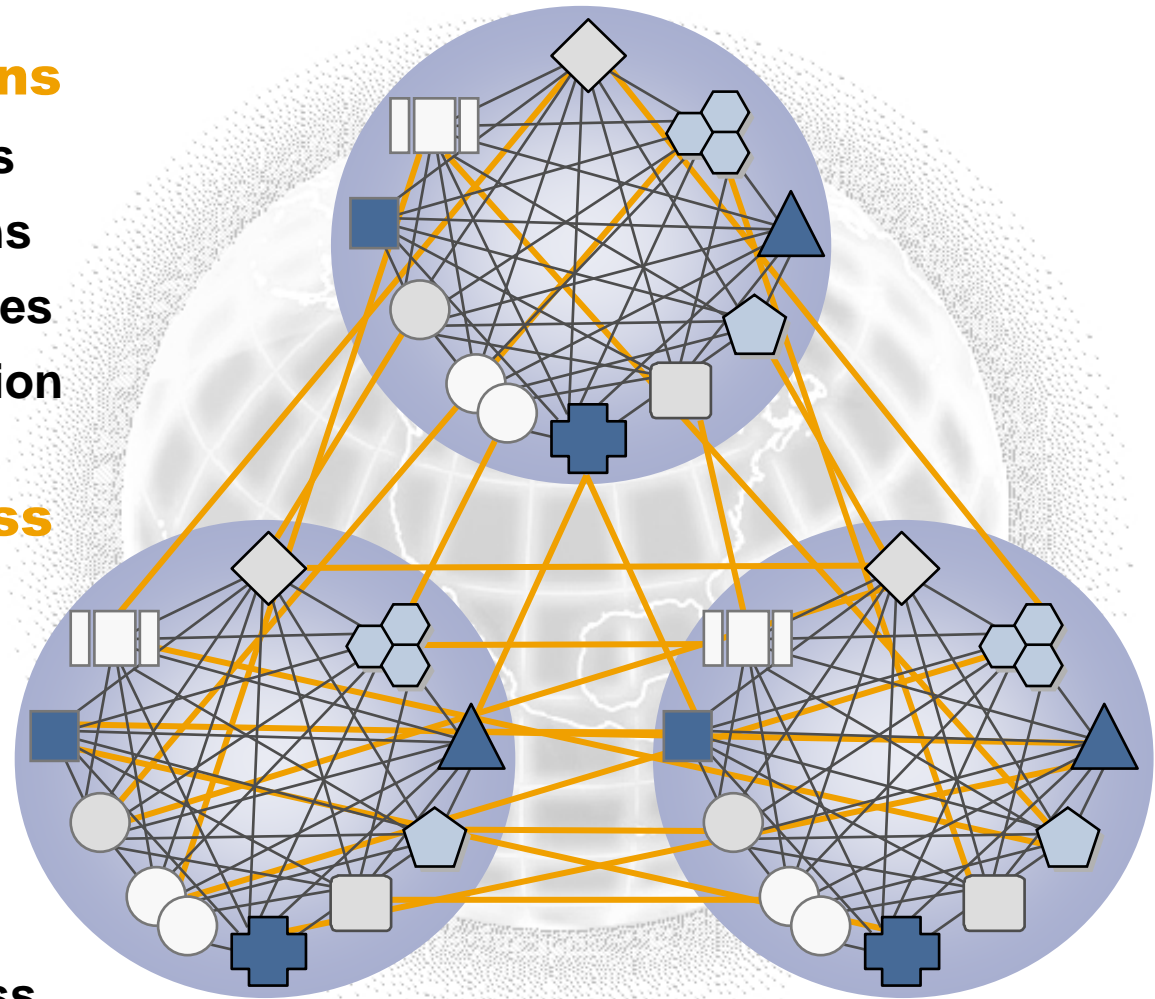
But There is Still an Inter-Enterprise Nightmare

Best-of-breed solutions

- Many different vendors
- Custom made solutions
- Proprietary technologies
- Point-to-point Integration

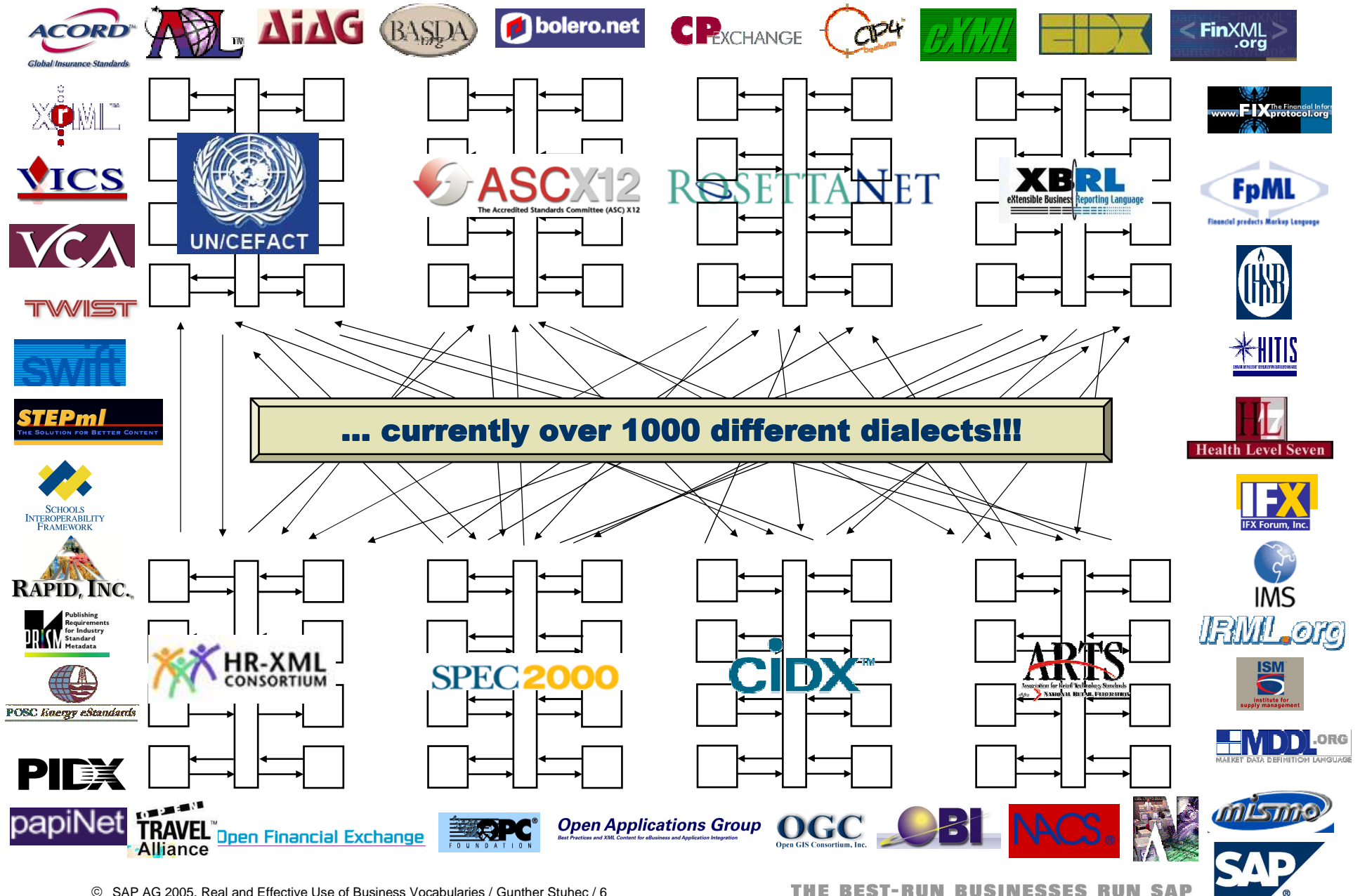
Risking future success

- Complex business environment
- Maintenance nightmare
- Multiple dependencies
- Many different business applications

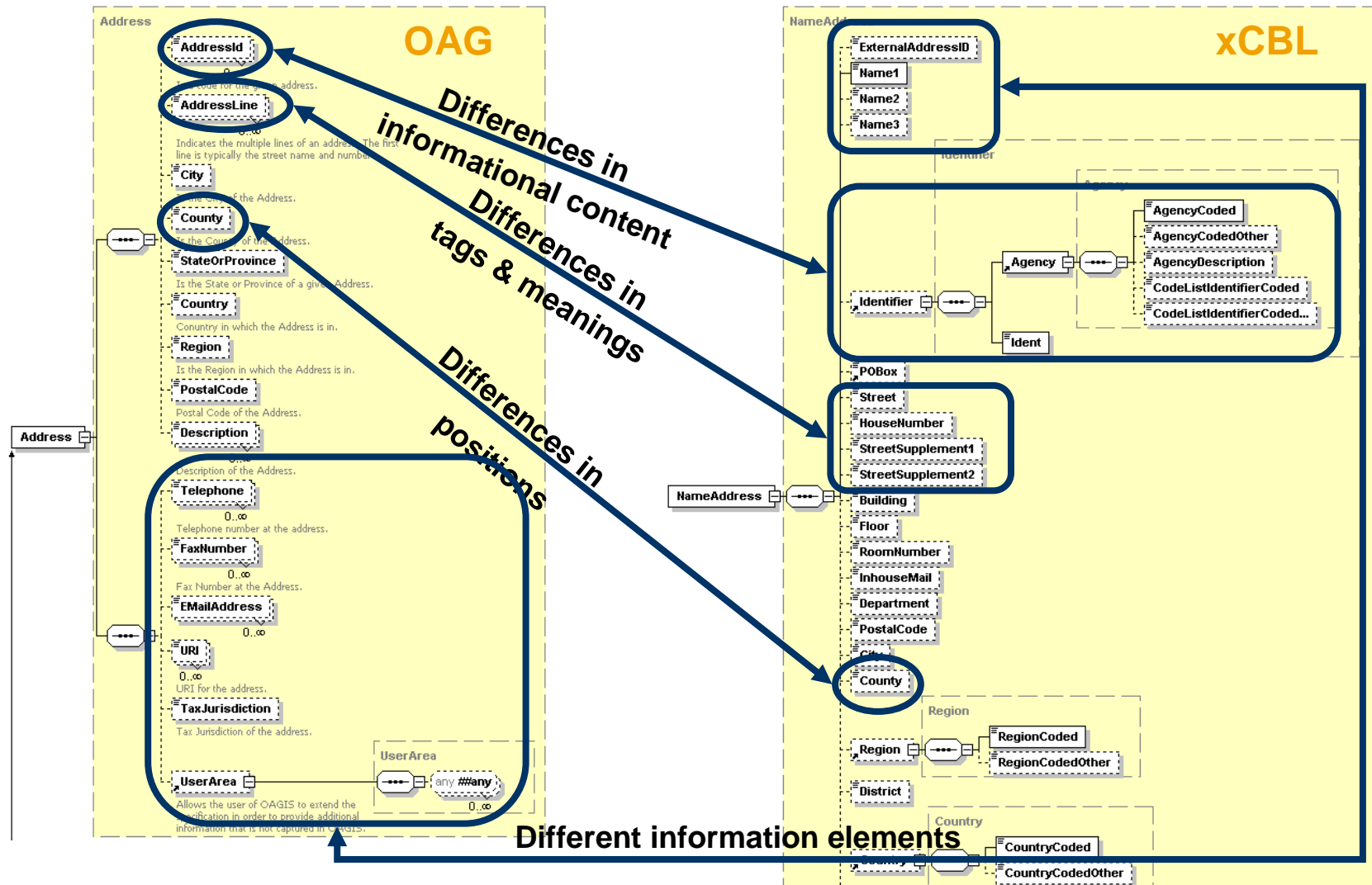


Customer value is lost

One Key-Part of this Nightmare is the Different Expression of Semantics by ..

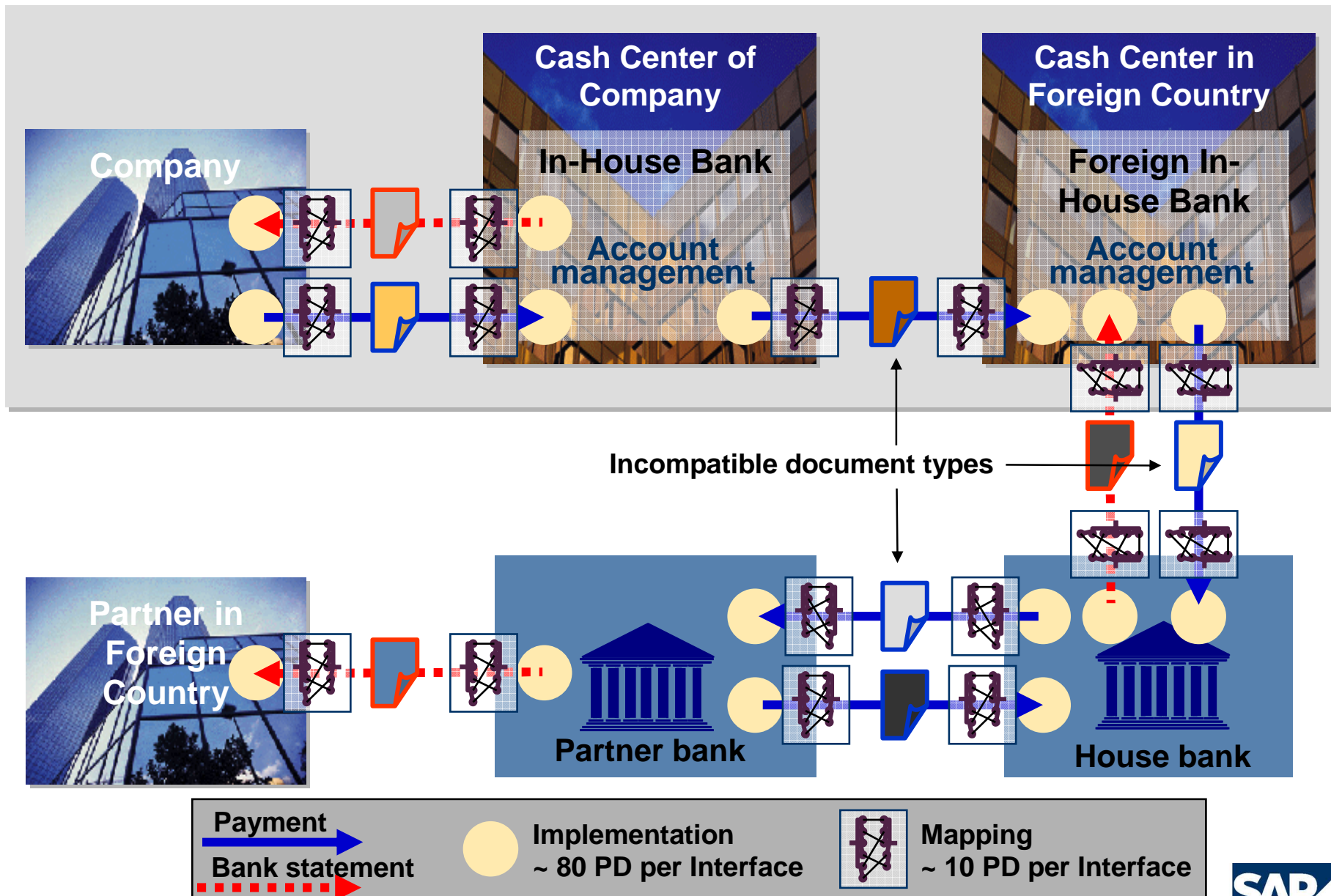


Same Semantics Expressed in Many Different Ways

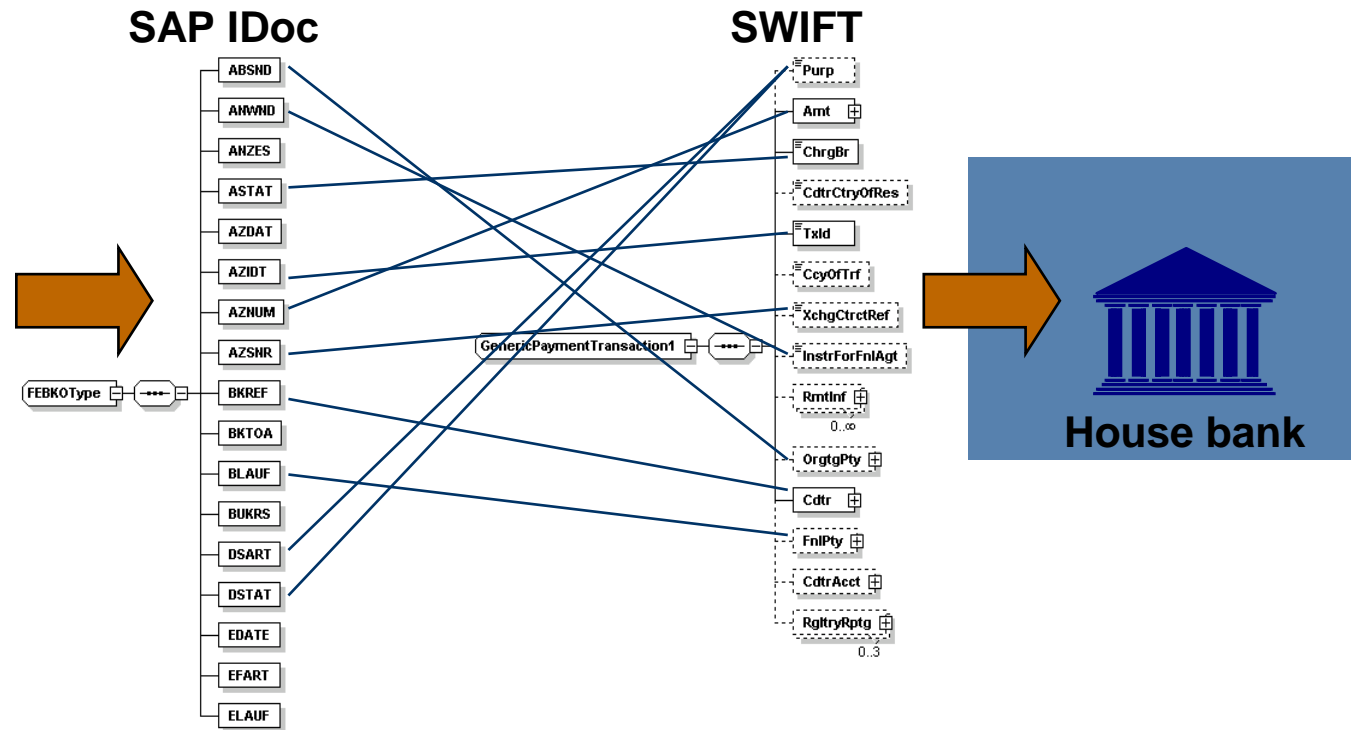


Allways an ineffective and expensive semantic mapping is required !!!

Required Mappings in a Real Scenario



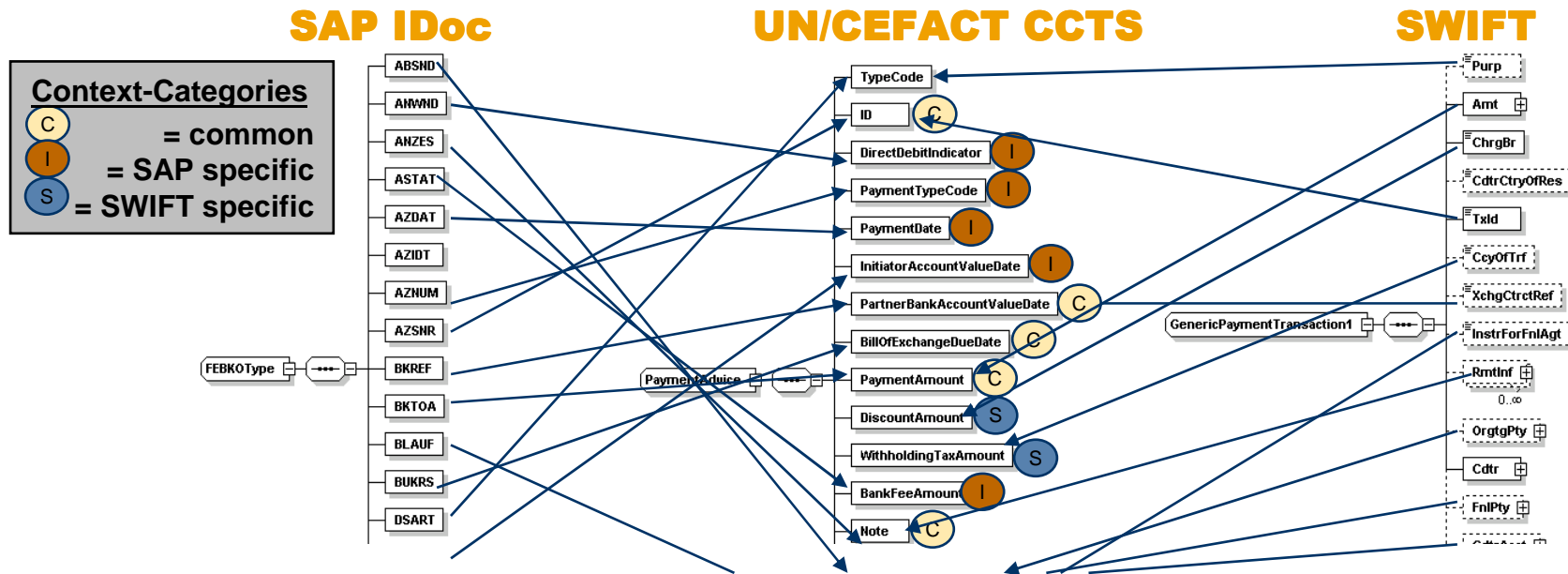
B2B Inefficiencies Today



Multiple structures and naming conventions for the same semantic meaning

- Costly and time-intensive mapping efforts required
- Cost of integration for additional partners almost unpredictable

How To Overcome B2B Inefficiencies



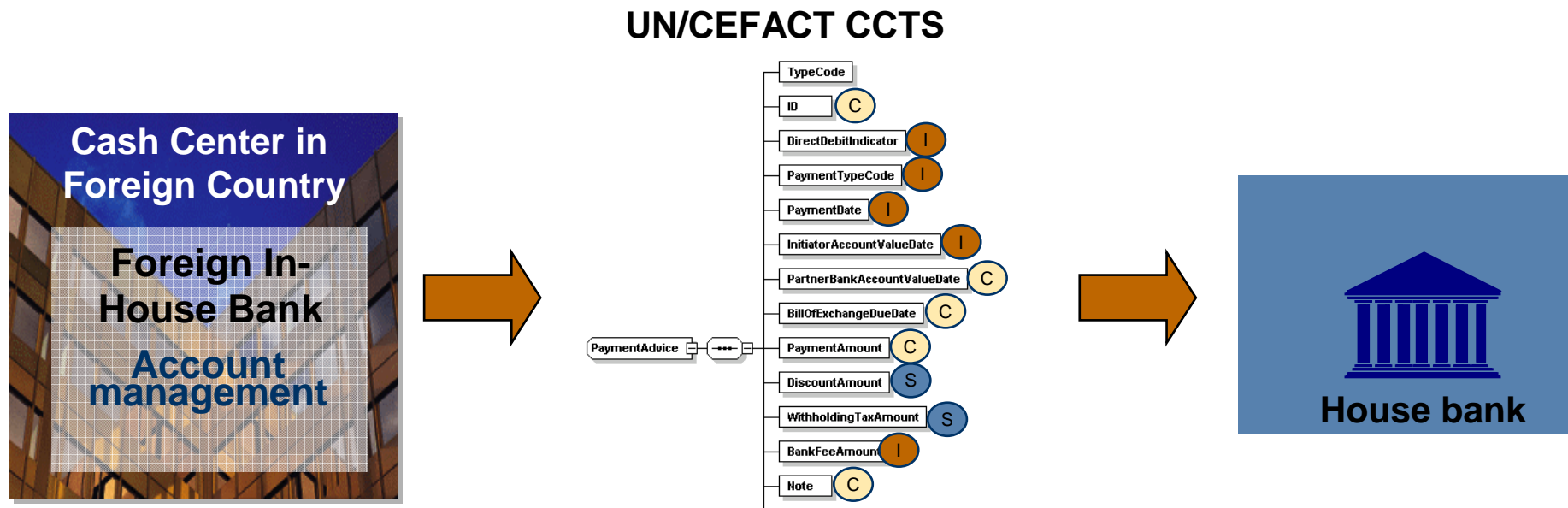
Demand for guidelines of semantic

- Human and machine readable naming and design rules for structure and meaning
- Independent of any implementation syntax
- Reusable, modular e-business building blocks
- Context-specific extension mechanisms

Benefits

- Applicable to all vertical industries and horizontal applications
- Can be used in in any implementation syntax
- Greater international acceptance

What is necessary to make B2B more efficient?

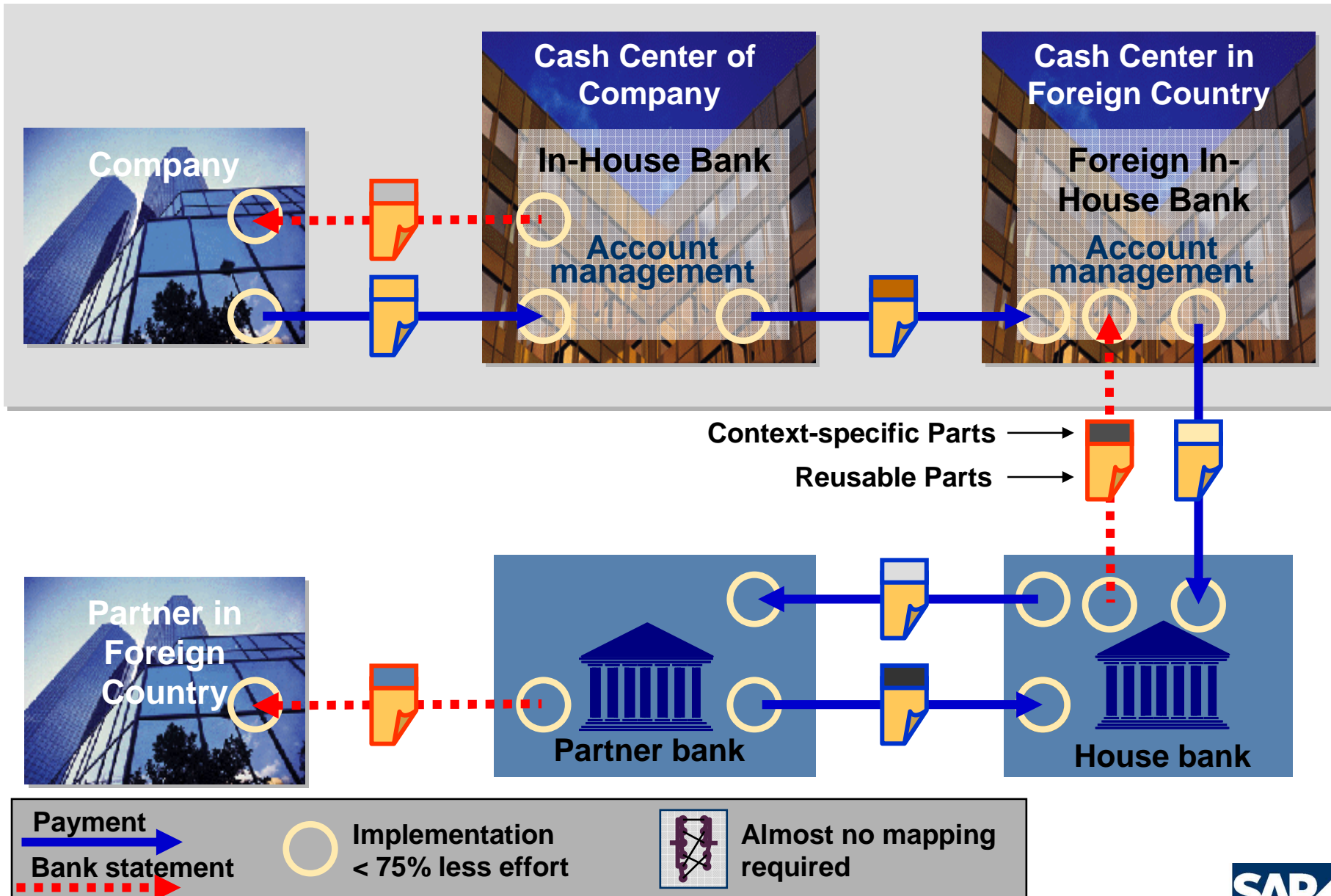


UN/CEFACT CCTS (ISO 15000-5) is the methodology for developing a common set of semantic building blocks

It is a way to

- identify, capture and maximize the re-use of business information
- to support and enhance information interoperability across multiple business situations
- by direct implementations of interfaces and
- with minimized mapping efforts.

Local Payments With Final Posting (Future)



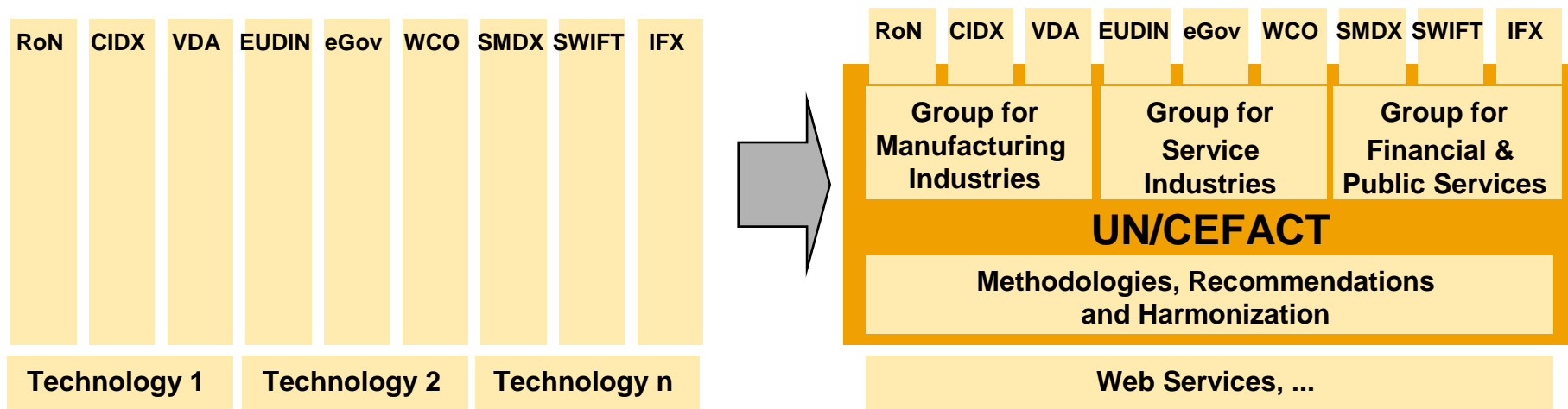
Harmonization and Maintenance of Repository Content

Content of Repository can be enriched step by step with extensions done in industry initiatives and customer projects.

Extensions are classified using the specific context categories.

Process to recognize new requirements and harmonize them if needed by different industry solutions or customers.

Process can re-use UN/CEFACT harmonization experience.



General Aspects

Semantics & Core Components

SAP NetWeaver & Core Components

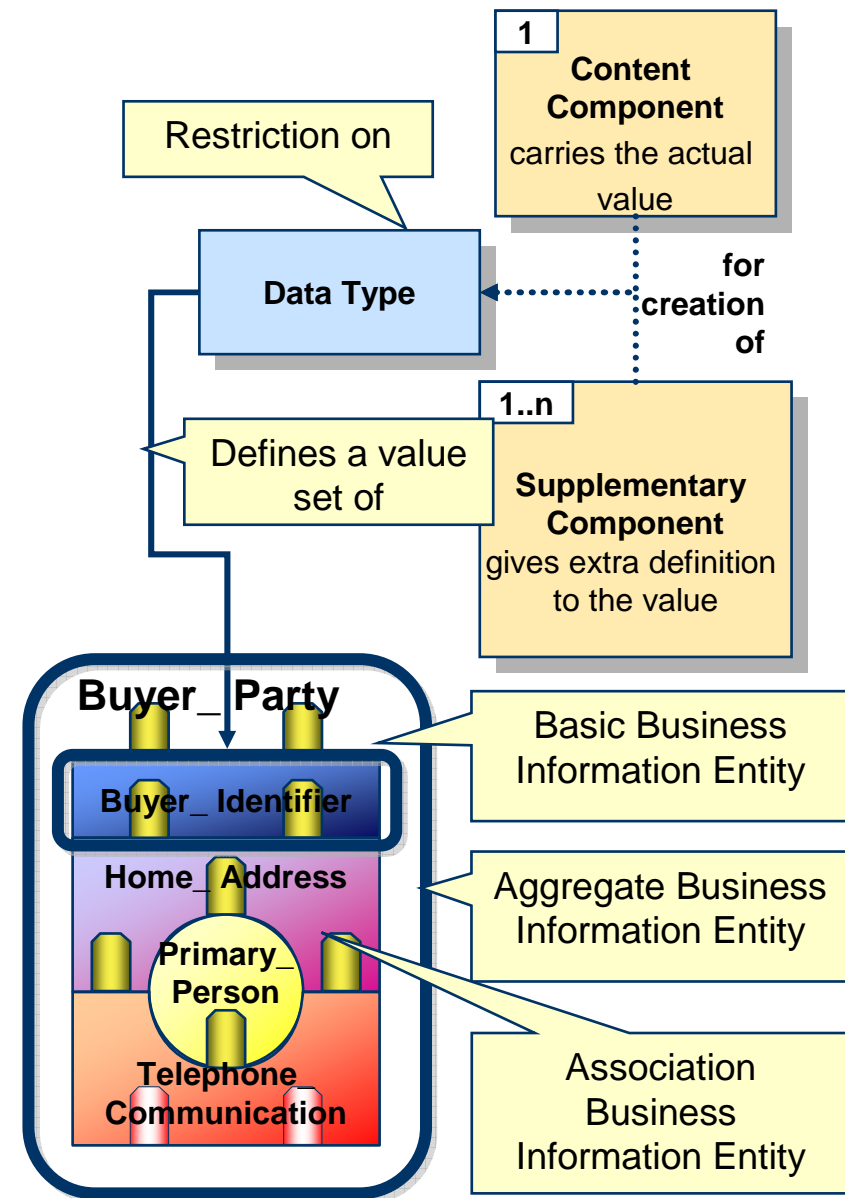
Implementation Example

UN/CEFACT Core Component Technical Specification

A syntax-independent **methodology** for developing a common set of semantic building blocks

A way to identify, capture and **maximize the re-use** of business information to support and enhance information interoperability across multiple business situations

UNCEFACT Core Components Technical Specification (CCTS) was developed by the ebXML Project, now **organized by UN/CEFACT** and ratified as ISO 15000 standard



Key Features

Core Data Types

- Fixed set (text, identifier, code, etc.)
- Fixed and unambiguous representation of values based on international standards

Naming Rules

- Based on ISO 11179
- Comparable with a grammar of a natural language

Design Rules

- Aggregation and assembling of business information
- Based on Codd's rules and normalization forms
- Follows consequently the OO-approach

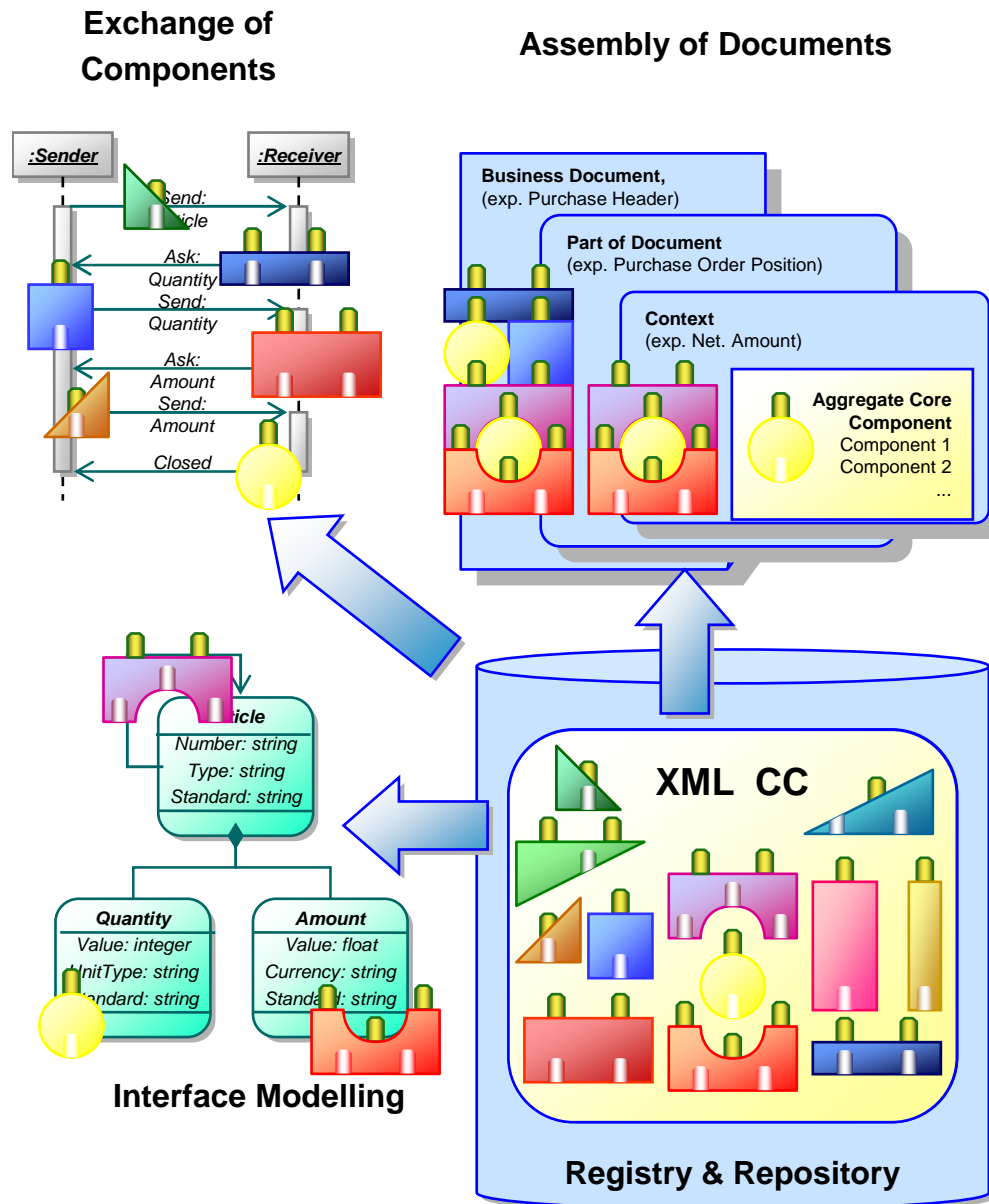
Context-Driver Principle

- Categorization of common and context-specific parts
- Used harmonization and consolidation
- Rules for selection of context specific parts (subsets)

Extensibility Mechanisms

- To address real business requirements

Syntax & Semantic with XML Naming and Design



XML Naming and Design Rules

- UN/CEFACT CCTS for semantic & structure
- W3C-Recommendation for syntax and representation

Makes the Core Components reusable by using all necessary XML based languages. It could be used for:

- building business documents
- defining application interfaces
- creating database tables
- as basis for data modelling
- creating user interfaces
- business objects in internal workflows
- defining partner profiles, catalogue structures etc.

Rules for Creation of Core Components

1.) Determination of type

Aggregation (ABIE)

Basic (BBIE)

Data Type

2.) Writing of the semantic description in one or two sentences.

These description should include the terms of ISO 11179, which are comorable to the parts (subject, predicate, object) of a sentence:

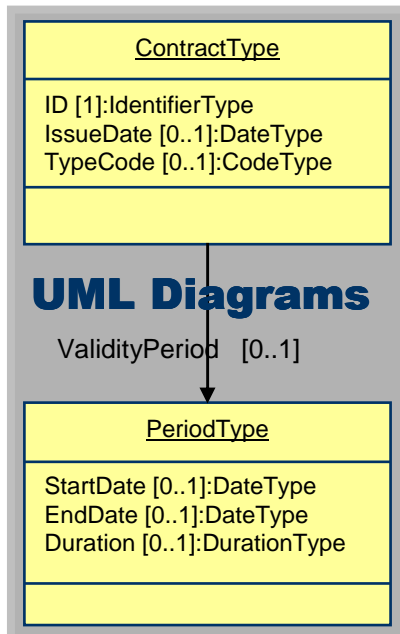
Object Class Term

Property Term

Representation Term

3.) Generation of the Dictionary Entry Names according CCTS rules

4.) Automatic generation of



XML

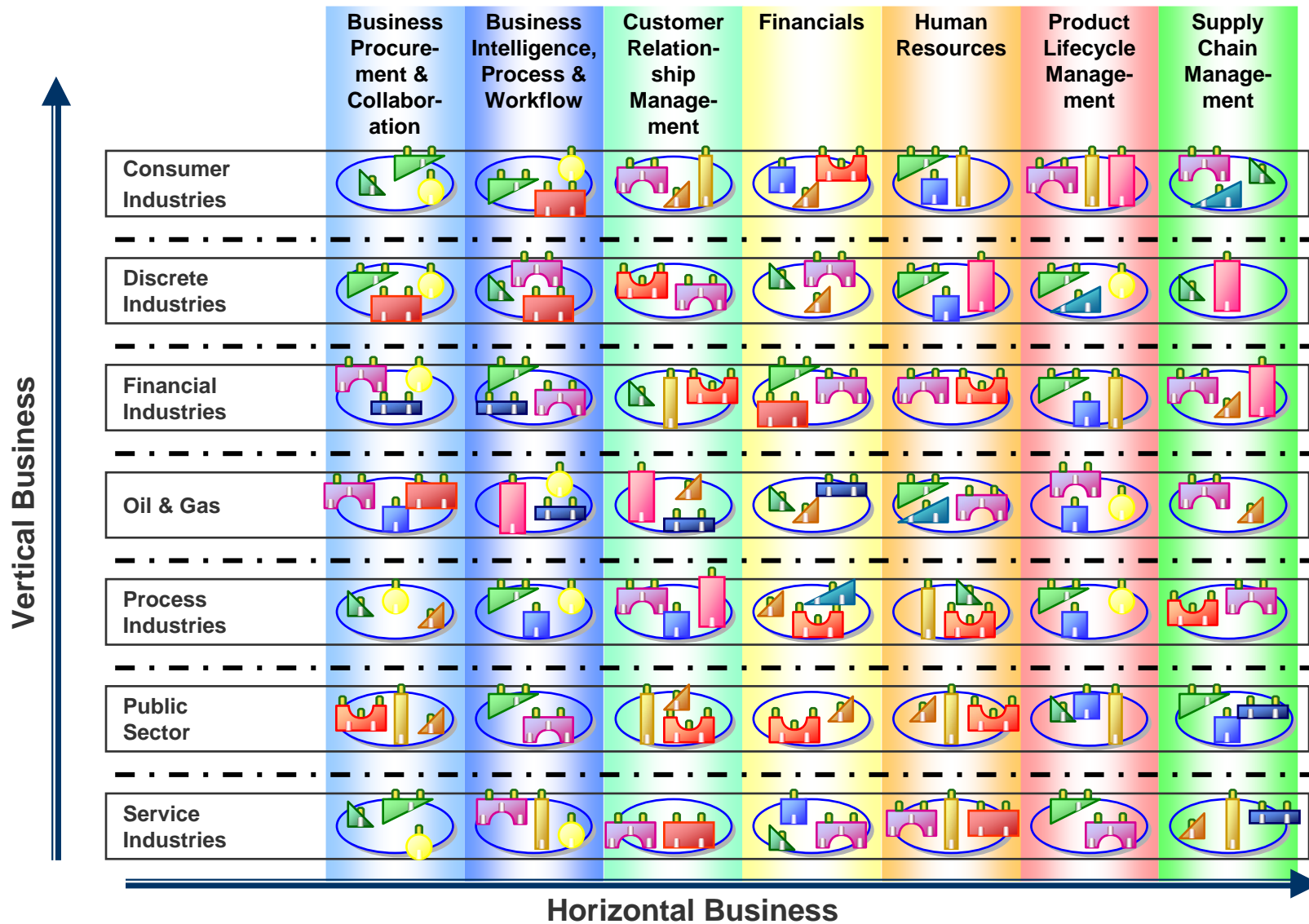
```
<Contract>
  <ID schemeAgencyID="34">ABC-34335-XY</ID>
  <IssueDate>2003-06-06</IssueDate>
  <TypeCode listID="20" listAgencyID="9" >
    XYA
  </TypeCode>
  <ValidityPeriod>
    <StartDate>2003-06-06</StartDate>
    <Duration>P1Y2M3DT10H30M</Duration>
  </ValidityPeriod>
</Contract>
```

ABAP Objects

Proxy Objects	Type	Description
Structure PERIOD_TYPE		Proxy Structure (generated)
START_DATE	DATE_TYPE	
END_DATE	DATE_TYPE	
DURATION	DURATION_TYPE	

```
public void WriteOutToPS
(PrintWriter ps, boolean fullDoc) {
  String s, sa;
  if (ps == null) return;
  if (fullDoc == true) {
    /* Output XML node */
    ps.print("<ValidityPeriod>\r\n");
  }
  s = tf_StartDate.getText();
  if (s.equals("") == false) {
    ps.print("<StartDate>");
    ps.print(">" + s + "</StartDate>\r\n");
  }
  s = tf_EndDate.getText();
  if (s.equals("") == false) {
    ps.print("<EndDate>");
    ps.print(">" + s + "</EndDate>\r\n");
  }
  s = tf_Duration.getText();
  if (s.equals("") == false)
  ...
}
...
JAVA Code
```

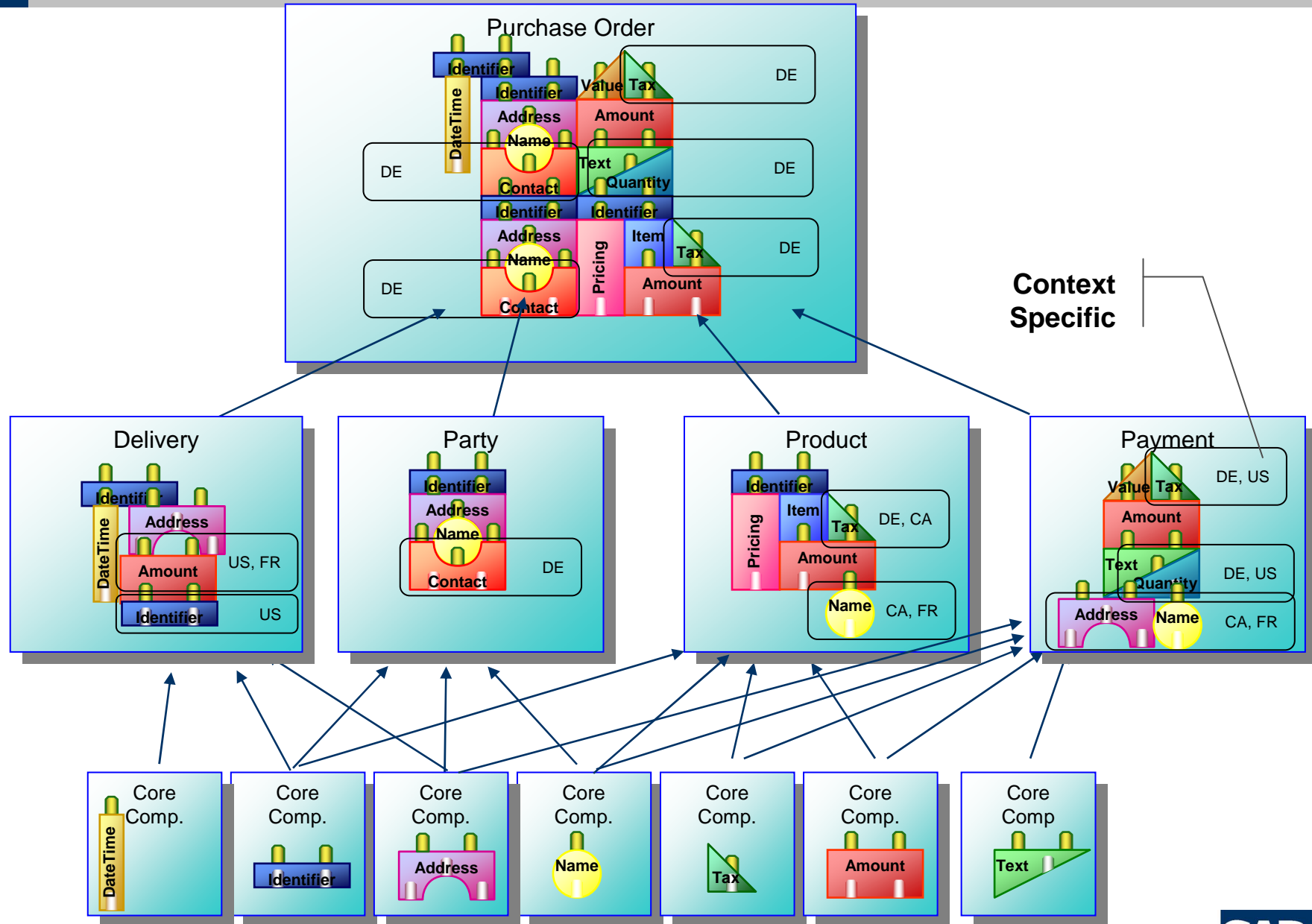
Context of Core Components



Vertical Business

Horizontal Business

Context Specific Building Block System

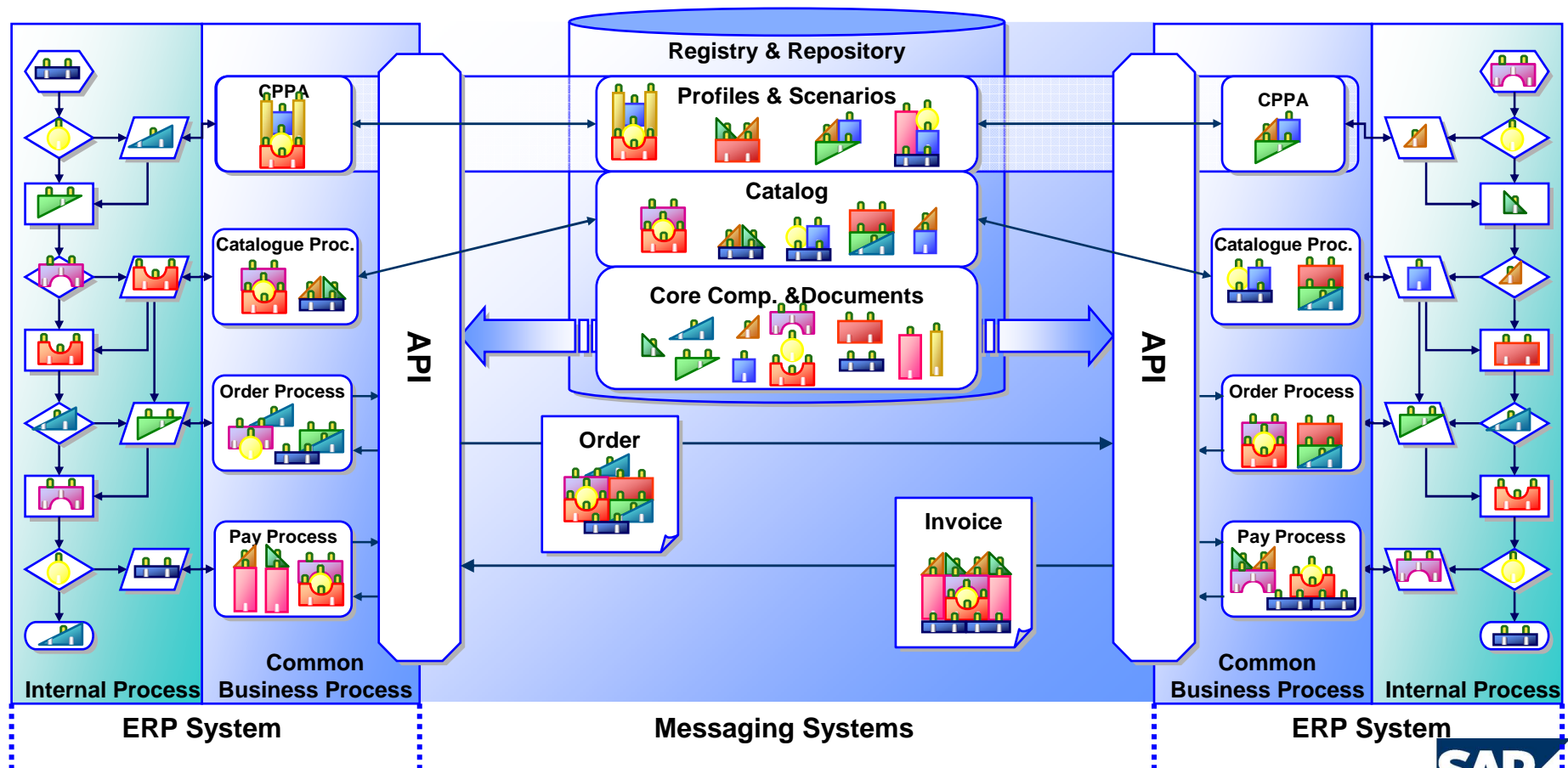


The Advantage of Common and Context Specific Semantic

Same and unambiguous understanding of business information in all industry areas (semantic) and applications (technique) → Therefore: high reusability in semantic and technique

Same usage of business information internally (applications) and externally (between business partners)

Less effort for internal and external interoperability in long term: Because of massive reducing of internal or external mapping



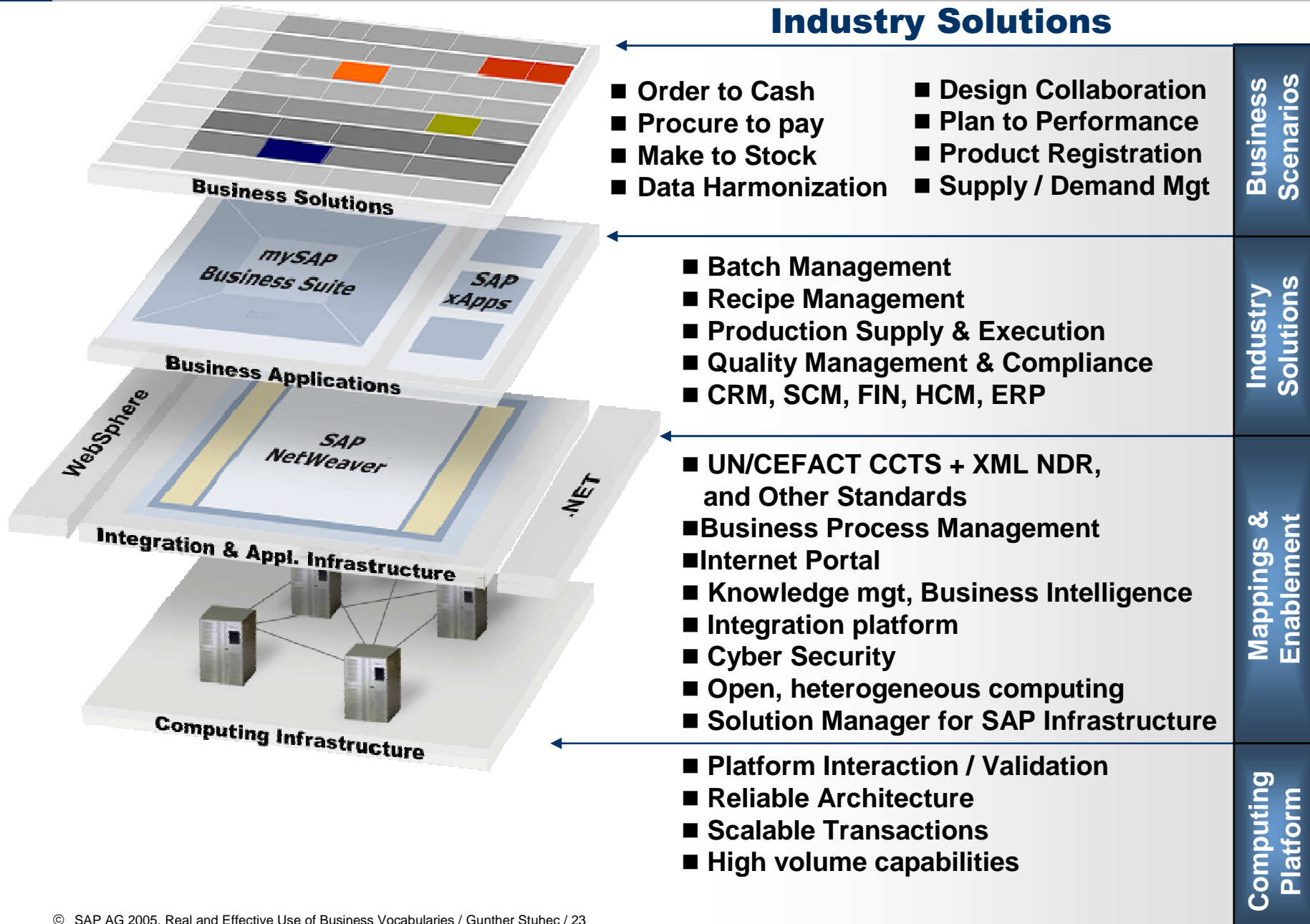
General Aspects

Semantics & Core Components

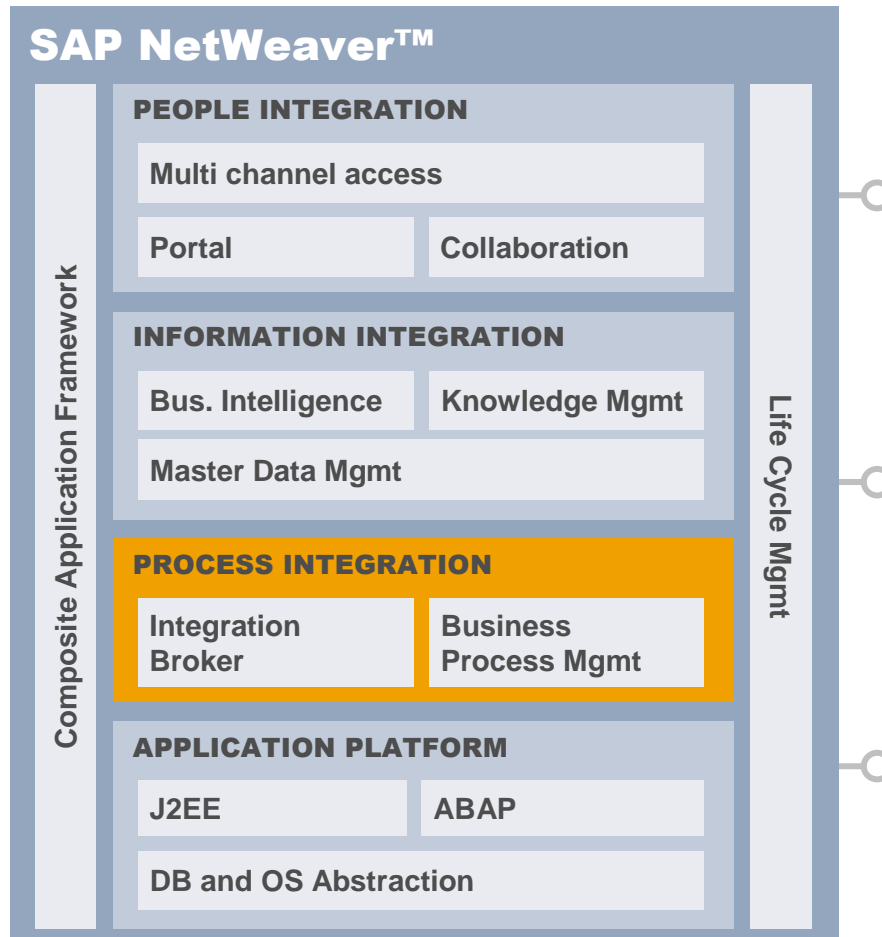
SAP NetWeaver & Core Components

Implementation Example

Industry Standards Enable New Scenarios



An open integration and application platform that enables change!



Unifies and aligns people, information and business processes

- Integrates across technologies and organizational boundaries
- A safe choice with full .NET and J2EE interoperability

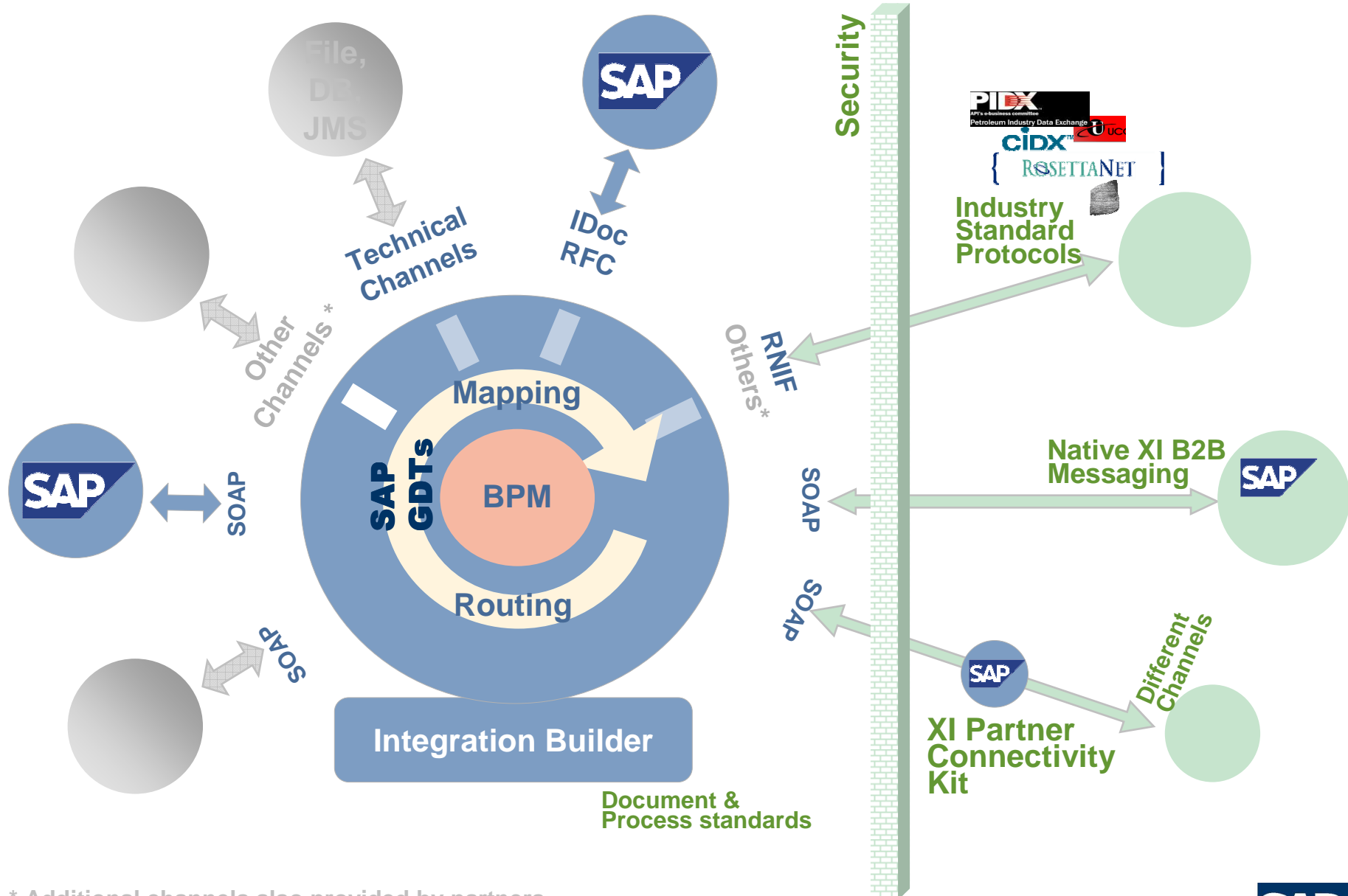
The business foundation for SAP and partners

- Powers business-ready solutions that reduce custom integration
- Its Enterprise Service Architecture increases business process flexibility

Process Integration is provided by SAP Exchange Infrastructure

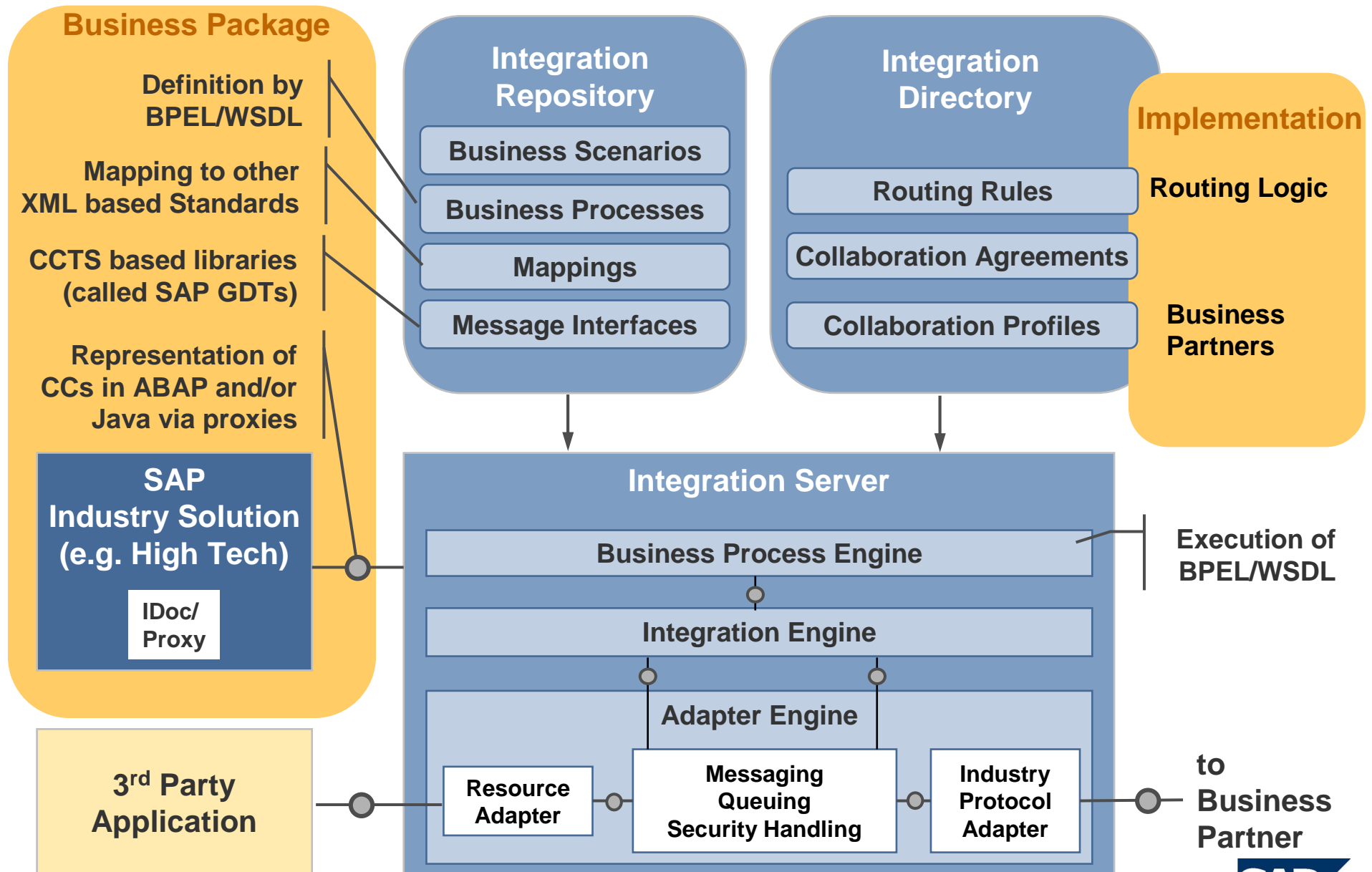
- Open and heterogeneous
- For SAP and non-SAP applications
- For A2A and B2B scenarios
- For synchronous and asynchronous communication
- For cross-component Business Process Management
- Based on Web Service and industry standards

SAP XI in A2A and B2B Landscapes



* Additional channels also provided by partners

Support of UN/CEFACT Standards by SAP XI



Interfaces in the Integration Repository

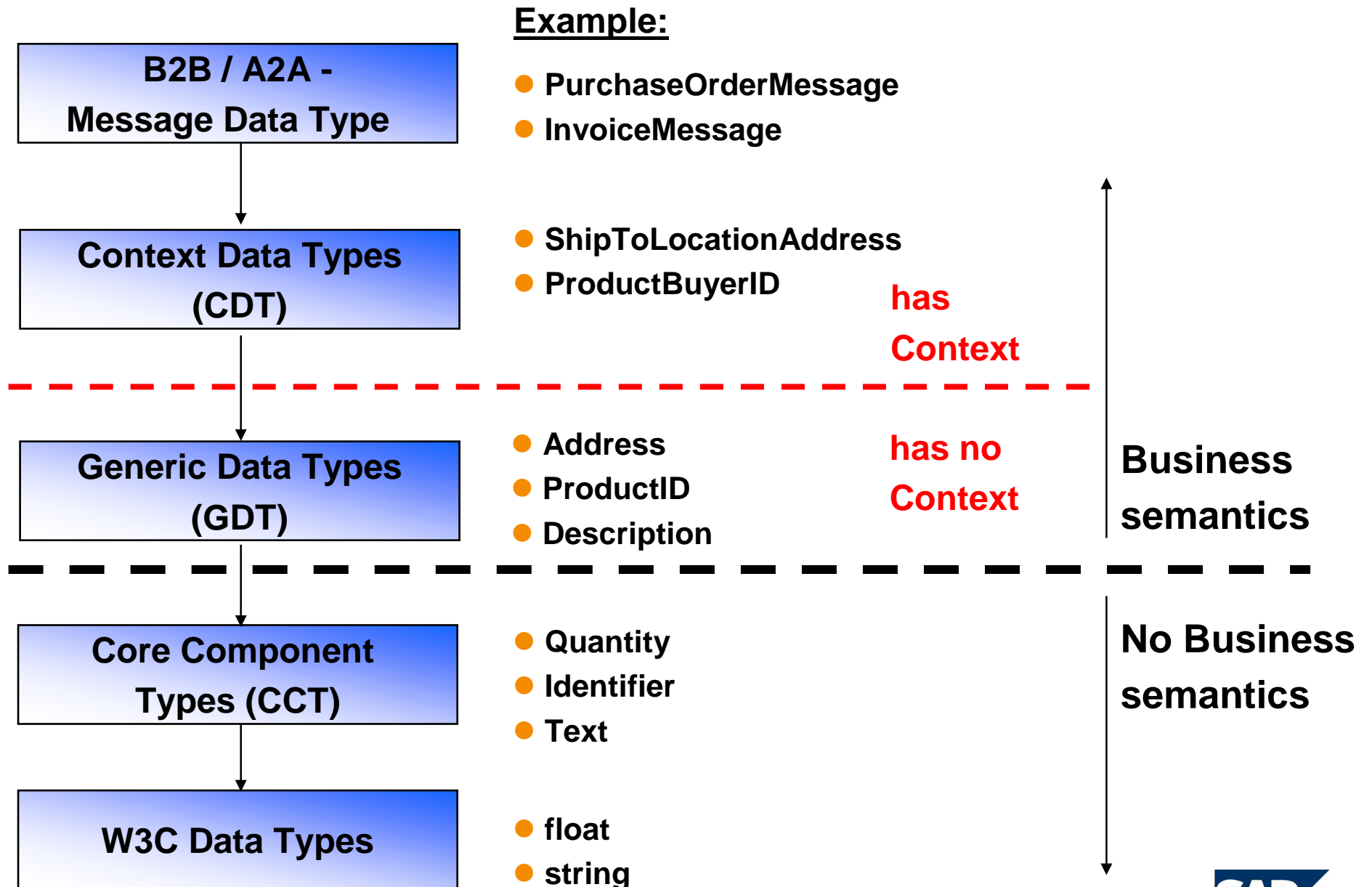
- Scenario-driven development of interfaces
- Outside-in development of interfaces with reference to Global Data Types and standards
- Interface Types
 - ◆ B2B interfaces (B2B) – for external exchange between business partners
 - ◆ A2A interfaces (A2A) – for internal exchange between SAP and non-SAP applications

B2B/A2A interfaces consist of Global Data Types only

Global Data Types in the Integration Repository

- Global Data Types are SAP-wide defined data types with business content, as found in standards, or should be found in standards, or which are structured in accordance with standards.

Meta Structure in SAP XI



Uniform structure and typing

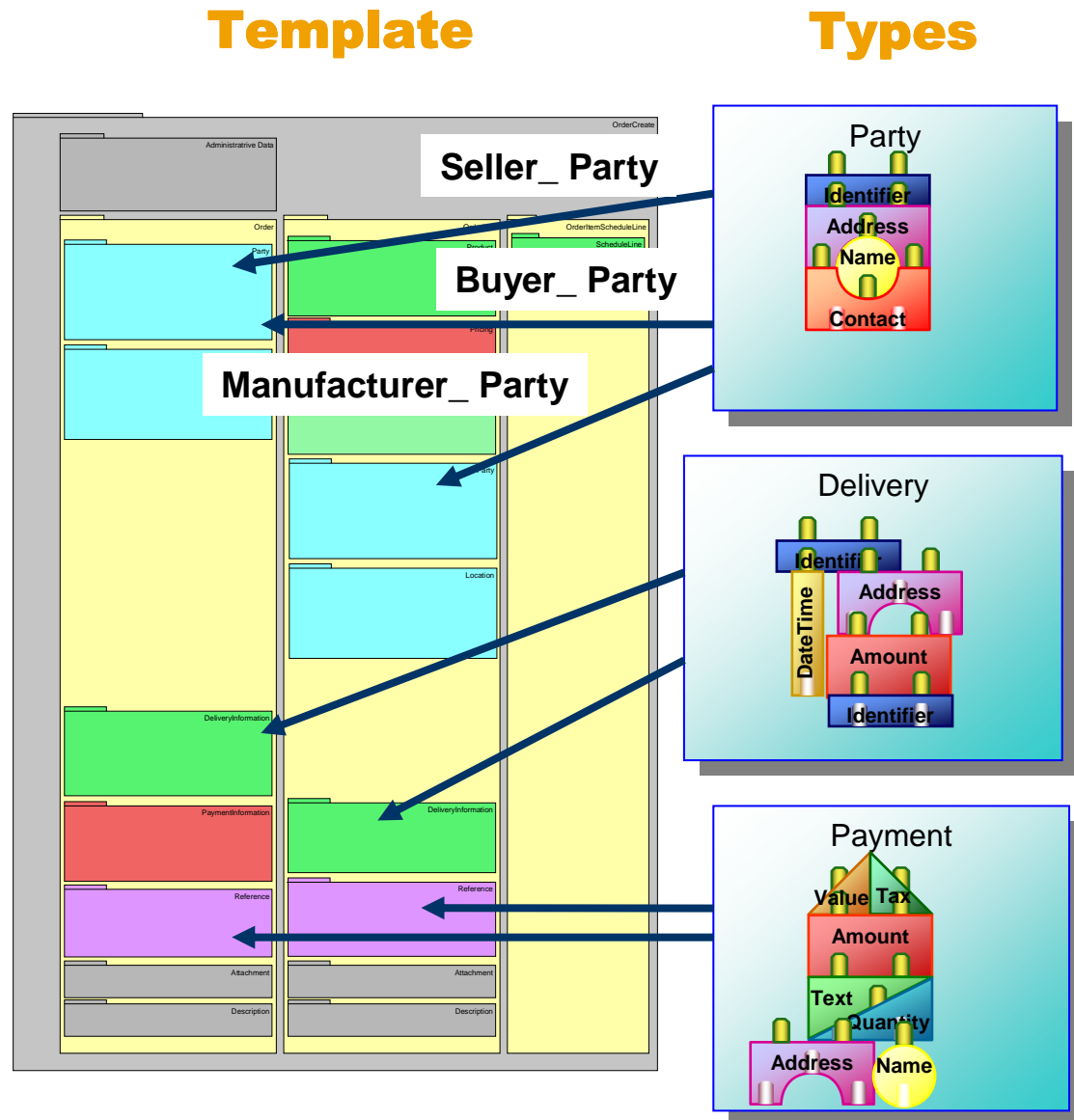
Top-Down:

- Uniform structure via Interface Templates
- Identical build-up structure **for all interfaces**

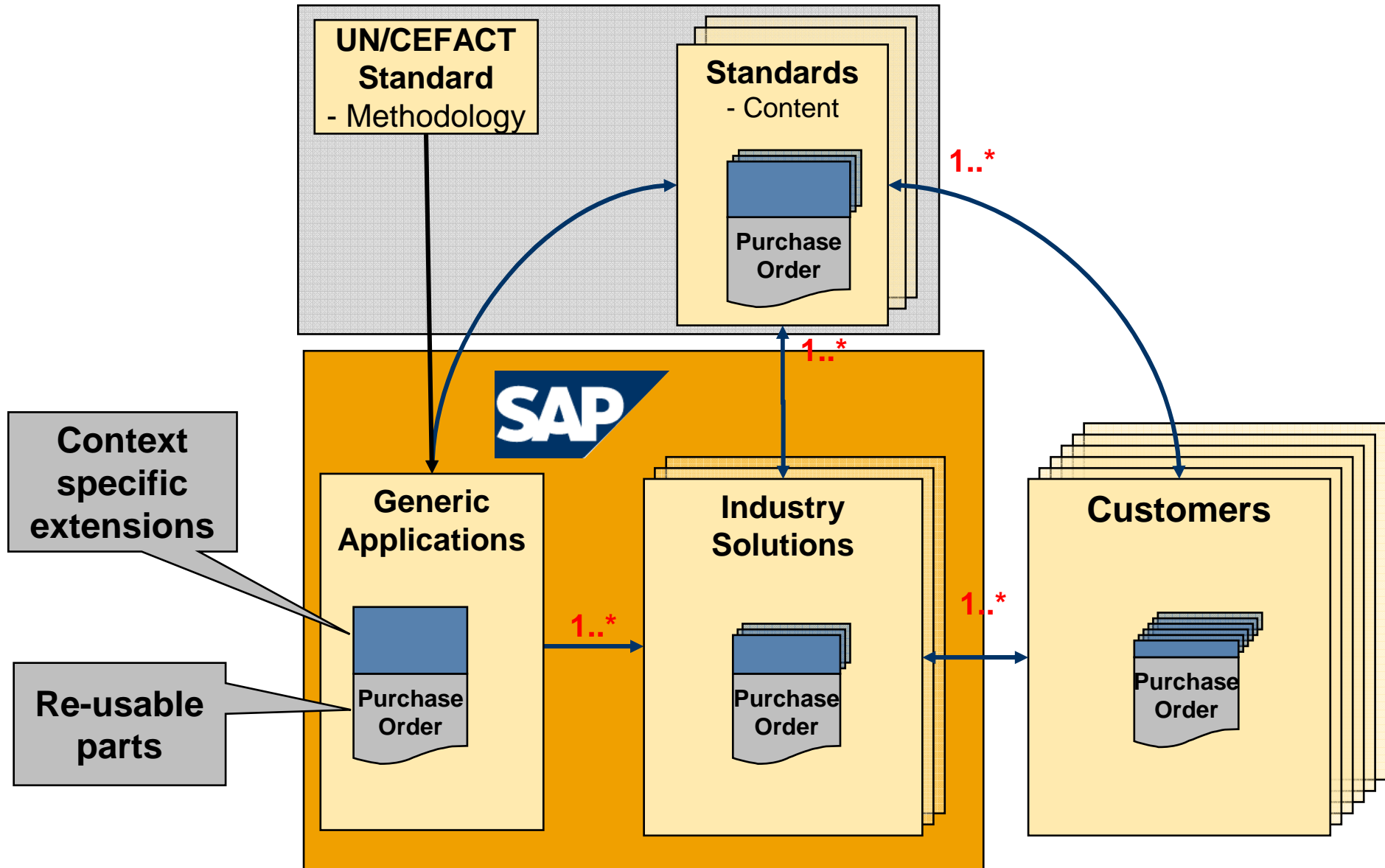
Bottom-up:

- Uniform typing of SAP GDTs be CCTS conventions
- A Message Interface is a hierarchical structure.

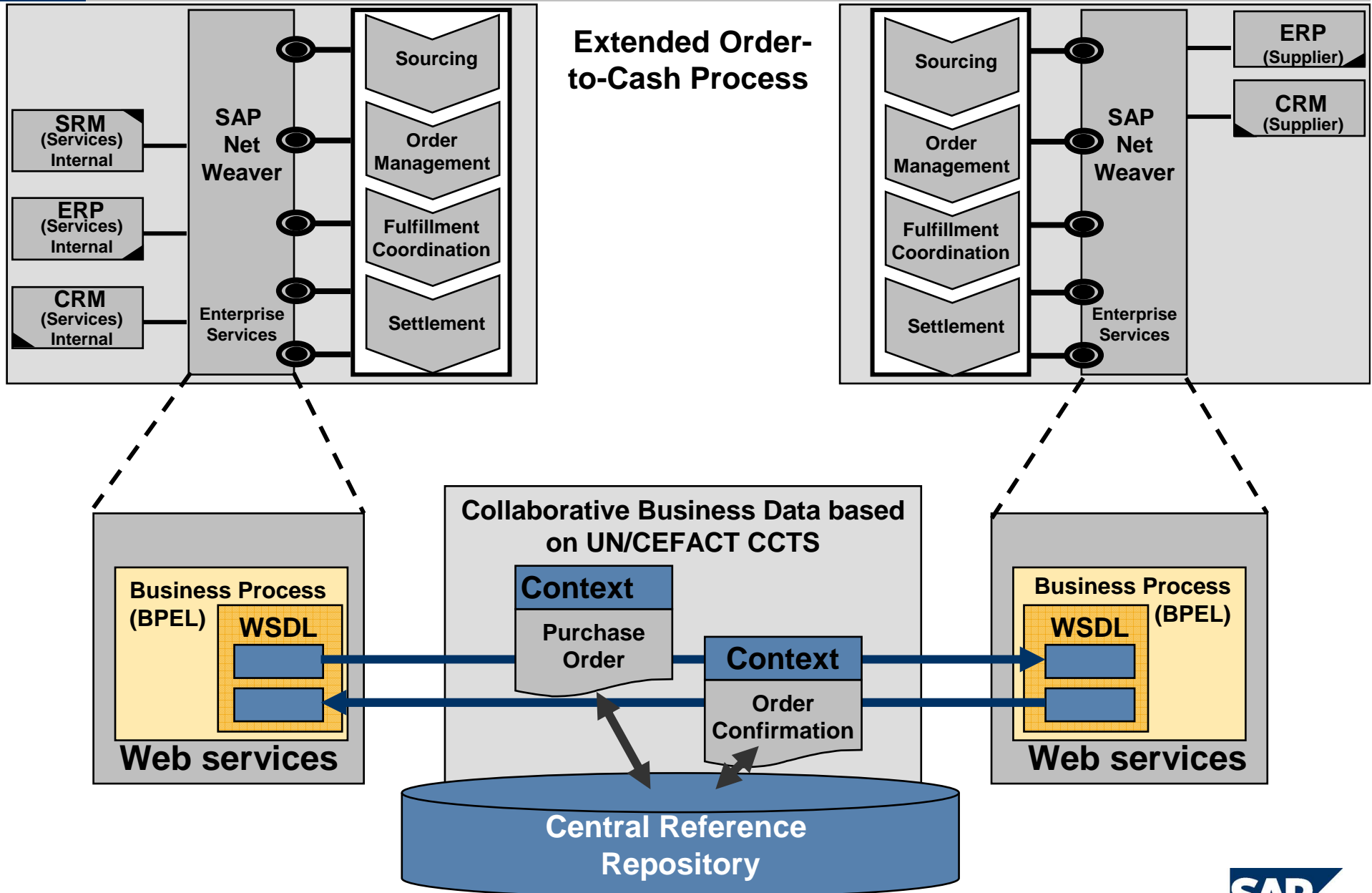
In B2B and A2A Interfaces the same subject matter is always described with the same data type



Closed Loop Process Vision



Enterprise Services Architecture



General Aspects

Semantics & Core Components

SAP NetWeaver & Core Components

Implementation Example

Message Interface: ProductActivityNotification_In

Context specific subset for SCM

Direction and type of exchange

Message Data Types

Integration Builder: Design (XIR_PWDF0765_65)

Objekt Bearbeiten Ansicht Navigation Werkzeuge Hilfe

Repository Änderungslisten

Namensraum

gen

SAP SCM BASIS

SAP SCM BASIS 4.0

http://sap.com/xi/SCMBasis

http://sap.com/xi/SCMBasis/Global

Business-Szenario-Objekte

Interface-Objekte

Message-Interfaces

- DeliveryScheduleNotification_In
- DespatchedDeliveryNotification_In
- DespatchedDeliveryNotification_Out
- OrderIDAssignmentNotification_In
- ProductActivityNotification_In**
- ReceivedDeliveryNotification_In
- ReplenishmentOrderNotification_Out
- VendorGeneratedOrderNotification_Out

Message-Typen

- DeliveryScheduleNotification
- DespatchedDeliveryNotification
- OrderIDAssignmentNotification
- ProductActivityNotification
- ReceivedDeliveryNotification
- ReplenishmentOrderNotification
- VendorGeneratedOrderNotification

Fault-Message-Typen

- DeliveryScheduleNotificationFault
- DespatchedDeliveryNotificationFault

Message-Interface anze

Name Produ

Beschreibung Produktaktivit

Eringangsschrittstere

komponente "SAP SCM BASIS 4.0")

om/xi/SCMBasis. Status aktiv

Attribute

Richtung Inbound Outbound

Modus Synchron Asynchron

Message-Typen

Name

Input-Message-Typ ProductActivityNotification http://sap.com/xi/SCMBasis/Global

Fault-Message-Typen

Name	Namensraum
ProductActivityNotificationFault	http://sap.com/xi/SCMBasis/Global

ProductActivityNotification_In ProductActivityNotification ProductActivityNotification

Message & Data Type: ProductActivityNotification

Structure of Message Data Type based on Core Components

Struktur	Kategorie	Typ	Häufigke
ProductActivityNotification	Komplexer Typ		
ID	Element	MessageID	0..1
CreationDateTime	Element	DateTime	1
SenderParty	Element		1
StandardID	Element	PartyStandardID	0..1
ReceiverID	Element	PartyPartyID	0..1
ReceiverParty	Element		1
Item	Element	ProductActivityNotificationItem	1..unbou
ShipToLocation	Element		1
StandardID	Element	LocationStandardID	0..1
SenderID	Element	LocationPartyID	0..1
ReceiverID	Element	LocationPartyID	0..1
Product	Element		1
Inventory	Element		0..1
UnrestrictedUseQuantity	Element	Quantity	0..1
QualityInspectionQuantity	Element	Quantity	0..1
BlockedQuantity	Element	Quantity	0..1
PromotionQuantity	Element	Quantity	0..1
SalesTimeSeries	Element	TimeSeries	0..1
Item	Element		1..unbou
ValidityPeriod	Element	Period	1
Quantity	Element	Quantity	1
PromotionSalesTimeSeries	Element	TimeSeries	0..1
SalesForecastTimeSeries	Element	TimeSeries	0..1
PromotionSalesForecastTimeSeries	Element	TimeSeries	0..1
OrderForecastTimeSeries	Element	TimeSeries	0..1
PromotionOrderForecastTimeSeries	Element	TimeSeries	0..1
ConsumptionTimeSeries	Element	TimeSeries	0..1
ConsumptionForecastTimeSeries	Element	TimeSeries	0..1
OnOrderTimeSeries	Element	TimeSeries	0..1
OutOfStockTimeSeries	Element	TimeSeries	0..1

Message Data Types

- BusinessTransactionDocumentGroupID
- BusinessTransactionDocumentID
- BusinessTransactionDocumentItemID
- BusinessTransactionDocumentReferen
- DateTime
- DeliverySchedule
- DeliveryScheduleItem
- DeliveryScheduleItemScheduleLine
- DeliveryScheduleNotification
- DespatchedDelivery
- DespatchedDeliveryItem
- DespatchedDeliveryNotification
- ExchangeFaultData
- ExchangeLogData
- LocationPartyID
- LocationStandardID

Example: CashDiscountTerms in the Integration Repository

Structure of SAP GDT based on CCTS

XML Schema based on UN/CEFACT XML Naming and Design Rules

SAP Global Data Types based on CCTS

Detailed documentation of each SAP GDTs

Use

Notes

Definition

"Quantity" ist eine Menge mit der dazu gehörigen Mengeneinheit.

Example (Instance)

```
<OrderedQuantity unitCode="CT">100</OrderedQuantity>
```

- (CT = Karton)

Structure

Quantity ist vom Core Component Type "Quantity":

GDT	Category	Object Class	Property Term	Representation Term	Datentyp	Length	Card
Quantity	Complex Type			Quantity	xsd:decimal	19.6	
unitCode	Attribute	Quantity	Unit	Code	xsd:token	1..3	1

Detail Description and Value Ranges

Durch die Verwendung des builtin Datentypen "xsd:decimal" sind positive und negative Mengenangaben möglich. Bei negativen Mengenangaben ist ein vorangestelltes Negativzeichen "-" notwendig. Bei positiven Mengenangaben ist das vorangestellte

XSLT Mapping Content: R/3 IDoc to SAP GDTs (CCs)

Integration Builder: Design (XIR_PWDF0765_65)

Objekt Bearbeiten Ansicht Navigation Werkzeuge Hilfe

Repository Änderungslisten

Komponente ---- Alle ----
Version
Namensraum
Anzeigen

SAP SCM BASIS
SAP SCM BASIS 4.0
http://sap.com/xi/SCMBasis
http://sap.com/xi/SCMBasis/Global
Business-Szenario-Objekte
Interface-Objekte
Message-Interfaces
Message-Typen
Fault-Message-Typen
Datentypen
Mapping-Objekte
Interface-Mappings
DelinsDelfor01_DeliveryScheduleNotification_01
DesadvDelvry03_DespatchedDeliveryNotification_01
DespatchedDeliveryNotification_DesadvDelvry03_01
ProactProact01_ProductActivityNotification_01
StppodDelvry03_ReceivedDeliveryNotification_01
Message-Mappings
Importierte Archive
DelinsDelfor01_DeliveryScheduleNotification
DesadvDelvry03_DespatchedDeliveryNotification
DespatchedDeliveryNotification_DesadvDelvry03
ProactProact01_ProductActivityNotification
StppodDelvry03_ReceivedDeliveryNotification
SAP SCM BASIS 4.1
SAP XFW
SAP XRPM

Importiertes Archiv Ansicht Fenster

Name ProactProact01_Prodi Namensraum http://sap.com/xi/SCME Status aktiv

Programme des Archivs

Name	Pfad
ProactProact01_ProductActivityNotification_01.xsl	

ProactProact01_ProductActivityNotification_01.xsl anzeigen

SAP Global Data Types based on CCTS

Assigned to specific IDoc elements

```
<ID><value-of select="//EDI_DC40/DOCM" />  
<xsl:variable name="ProactVersion">  
<xsl:value-of select="//EDI_DC40/RCVP" />  
</xsl:variable>  
<CreationDateTime>  
<xsl:value-of select="substring(//E1EDK34/DATUM, 1, 4)"/>  
<xsl:text>- </xsl:text>  
<xsl:value-of select="substring(//E1EDK34/DATUM,5,2)"/>  
<xsl:text>- </xsl:text>  
<xsl:value-of select="substring(//E1EDK34/DATUM,7,2)"/>  
<xsl:text>T</xsl:text>  
<xsl:value-of select="substring(//E1EDK34/UZEIT,1,2)"/>  
<xsl:text>- </xsl:text>  
<xsl:value-of select="substring(//E1EDK34/UZEIT,3,2)"/>  
<xsl:text>- </xsl:text>  
<xsl:value-of select="substring(//E1EDK34/UZEIT,5,2)"/>  
<xsl:text>Z</xsl:text>  
</CreationDateTime>
```


Mapping and Routing in XI

The screenshot displays the SAP XML Message tool interface. The title bar reads "XML Message Edit Goto System Help" and includes the SAP logo. The main window is titled "Display XML Message Versions" and shows a tree view on the left and XML content on the right.

The tree view on the left shows the message structure:

- XML Message (Msg ID = 66AC14BFE7216E)
 - Inbound Message (CENTRAL)
 - SOAP Header
 - SOAP Body
 - Payloads
 - MainDocument (application/xml)
 - TraceDocument (text/plain)
 - XI_Context (text/xml)
 - Receiver Identification
 - Interface Determination
 - Technical Routing
 - Receiver Grouping
 - Message Split According to Receiver List
 - Request Message Mapping
 - SOAP Header
 - SOAP Body
 - Payloads
 - MainDocument (application/xml)
 - TraceDocument (text/plain)
 - Call Adapter
 - Response
 - SOAP Header
 - MessageHeader
 - HopList
 - TechnicalRouting
 - RunTimeHeader
 - PerformanceHeader
 - SOAP Body
 - Manifest
 - Payloads
 - TraceDocument (text/plain)

```
<?xml version="1.0" encoding="UTF-8" ?>
- <PROACT01>
- <IDOC BEGIN="1">
- <EDI_DC40 SEGMENT="1">
  <MANDT>100</MANDT>
  <DOCNUM>000000000499845</DOCNUM>
  <DOCREL>46C</DOCREL>
  <STATUS>30</STATUS>
  <DIRECT>1</DIRECT>
  <OUTMOD>2</OUTMOD>
  <IDOCTYP>PROACT01</IDOCTYP>
  <MESTYP>PROACT</MESTYP>
```

```
<?xml version="1.0" encoding="utf-8" ?>
- <ns1:ProductActivityNotification
  xmlns:ns1="http://sap.com/xi/SCMBasis/Global"
  xmlns:xsi="http://www.w3.org/2001/XMLSchema-
  instance">
  <ID>000000000499845</ID>
  <CreationDateTime>2005-08-
  18T17:32:11Z</CreationDateTime>
- <ReceiverParty>
  <ReceiverID>SMI_VN01</ReceiverID>
</ReceiverParty>
- <Item>
- <ShipToLocation>
```

Conclusion

SAP NetWeaver is SAP's integrated platform for application development and cross-platform integration

SAP XI Adapter Framework provides a rich and extensible means for connectivity to

Web Services Standards provide adapter-less cross-platform interoperability due to broad industry support

UN/CEFACT CCTS (ISO 15000-5) addresses the need for semantic interoperability

SAP actively participates in the development of open standards for maximized interoperability and minimized TCO

Questions?



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