EDIFECS
THE DNA OF B2B™

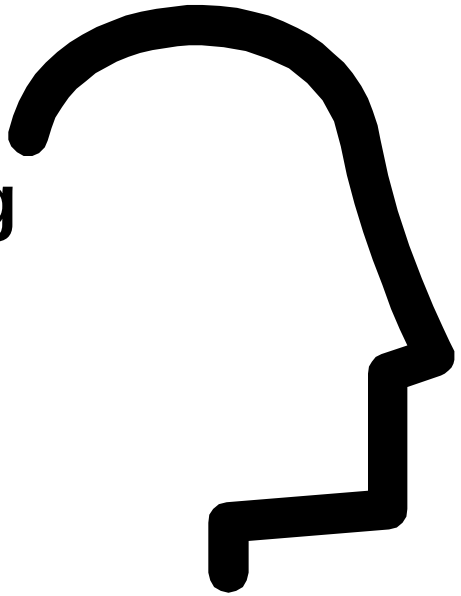
Model Based e-Business Transaction Specifications

Mapping between SCOR and e-business standards

John Yunker

Outline

1. Introduction
2. Business collaboration modeling methodology
3. RosettaNet
4. ebXML
5. Partner enablement
6. Conclusion

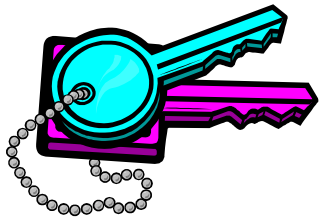


Vision

- **Align, implement and optimize supply chain partnerships**

  … using collaborative business protocols where dependent level III processes interact across enterprise boundaries

Keys to the Vision



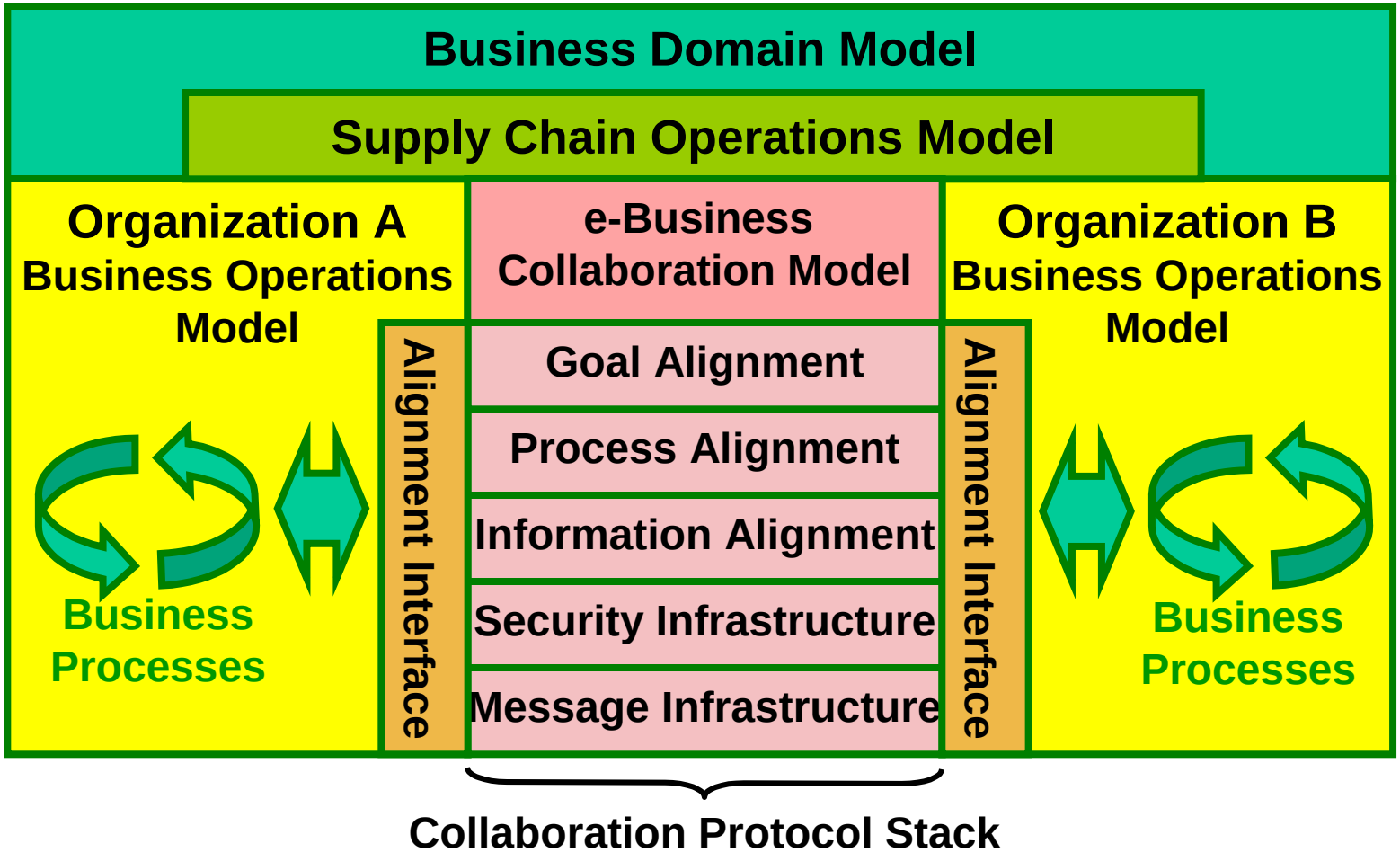
Requirements

- **Encapsulated process element definitions**
- **Business process alignment**
- **Business information alignment**
- **Partner technical alignment**
- **Partner and service discovery**

Standards Solutions

- → **Operations reference models SCOR, TOM**
- → **Partner process models RosettaNet, ebXML, OAG**
- → **EDI and XML messaging standards**
- → **Internet Implementation frameworks**
- → **Registries with partner and service descriptions**

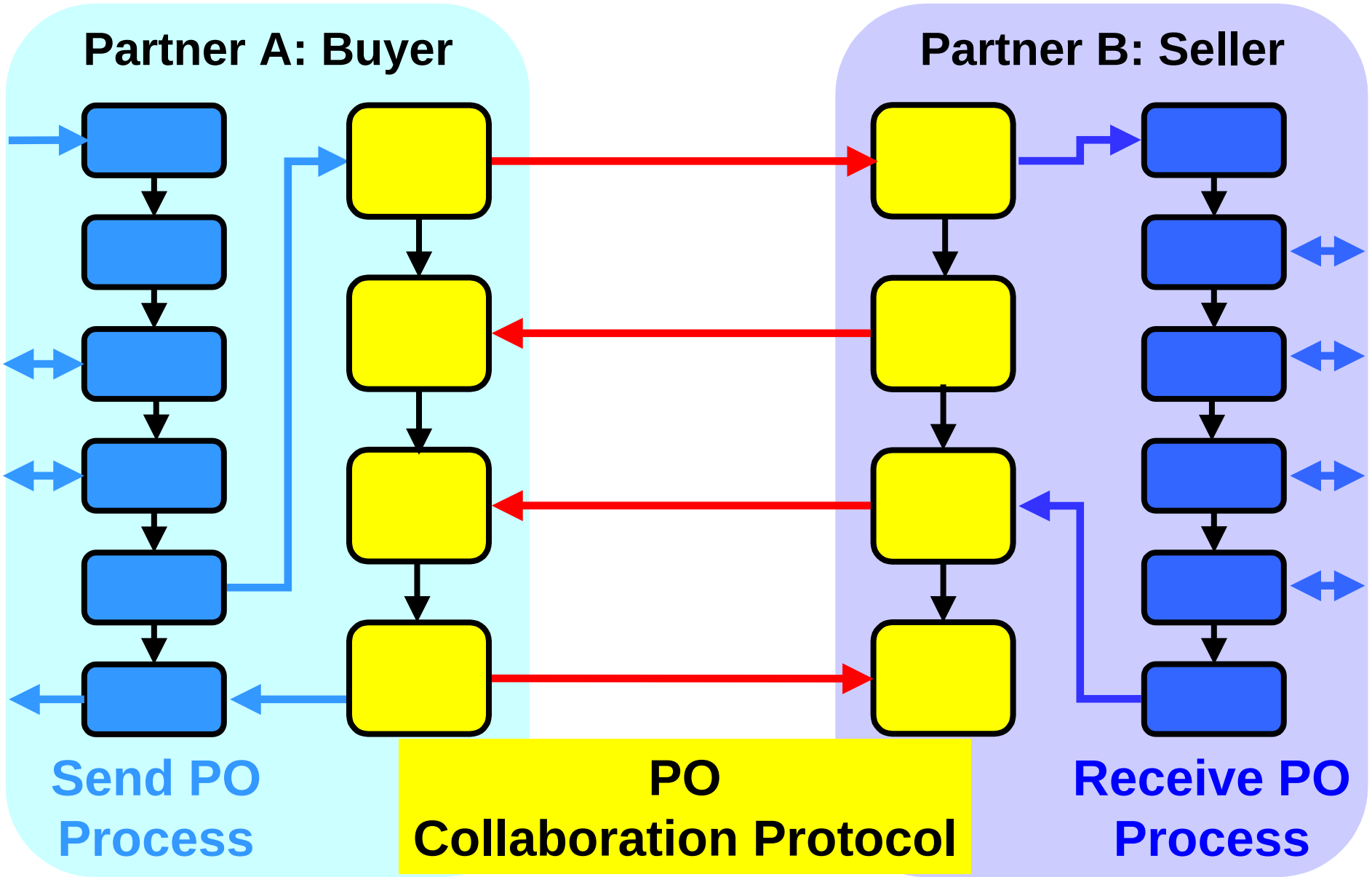
The alignment domain



The elaboration methodology

Protocol Stack Level	Modeled As	Elaborated Into
Goal alignment	Product / service definition; SCOR metric	Trading agreement; aggregate measures
Process alignment	SCOR level III process dependency	Collaboration protocol business actions
Information alignment	Business object state	eBusiness message
Security infrastructure	Partner authentication and authorization	Collaboration role and digital signature
Messaging infrastructure	Component interaction sequence diagrams	eBusiness implementation framework

Public and Private Processes



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2. **Business collaboration modeling methodology**
3. RosettaNet
4. ebXML
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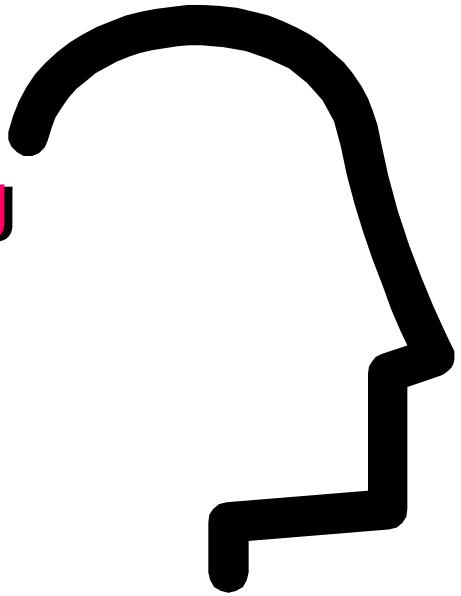
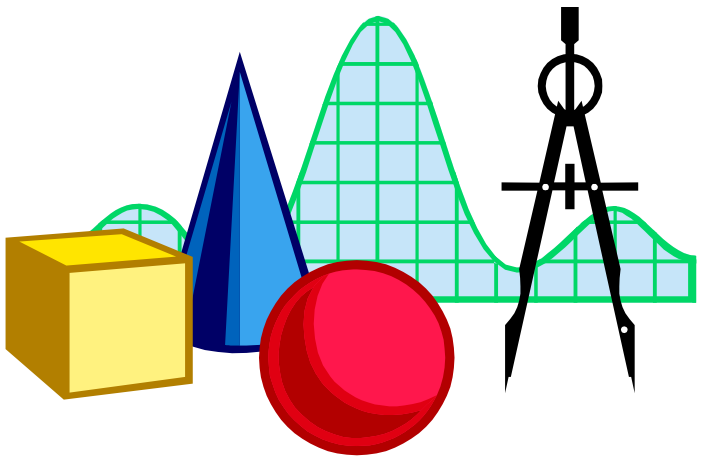


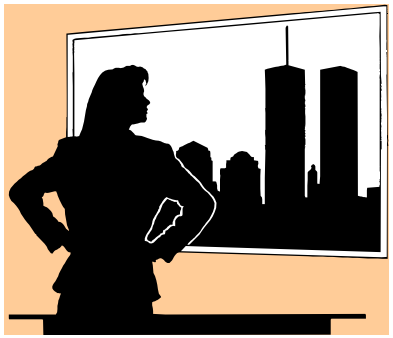
UML Business Collaboration Modeling

- **Unified Modeling Language (UML)**
- **UML profile**
- **UML methodology**
- **Patterns**
- **UN/CEFACT, RosettaNet, ebXML, …**

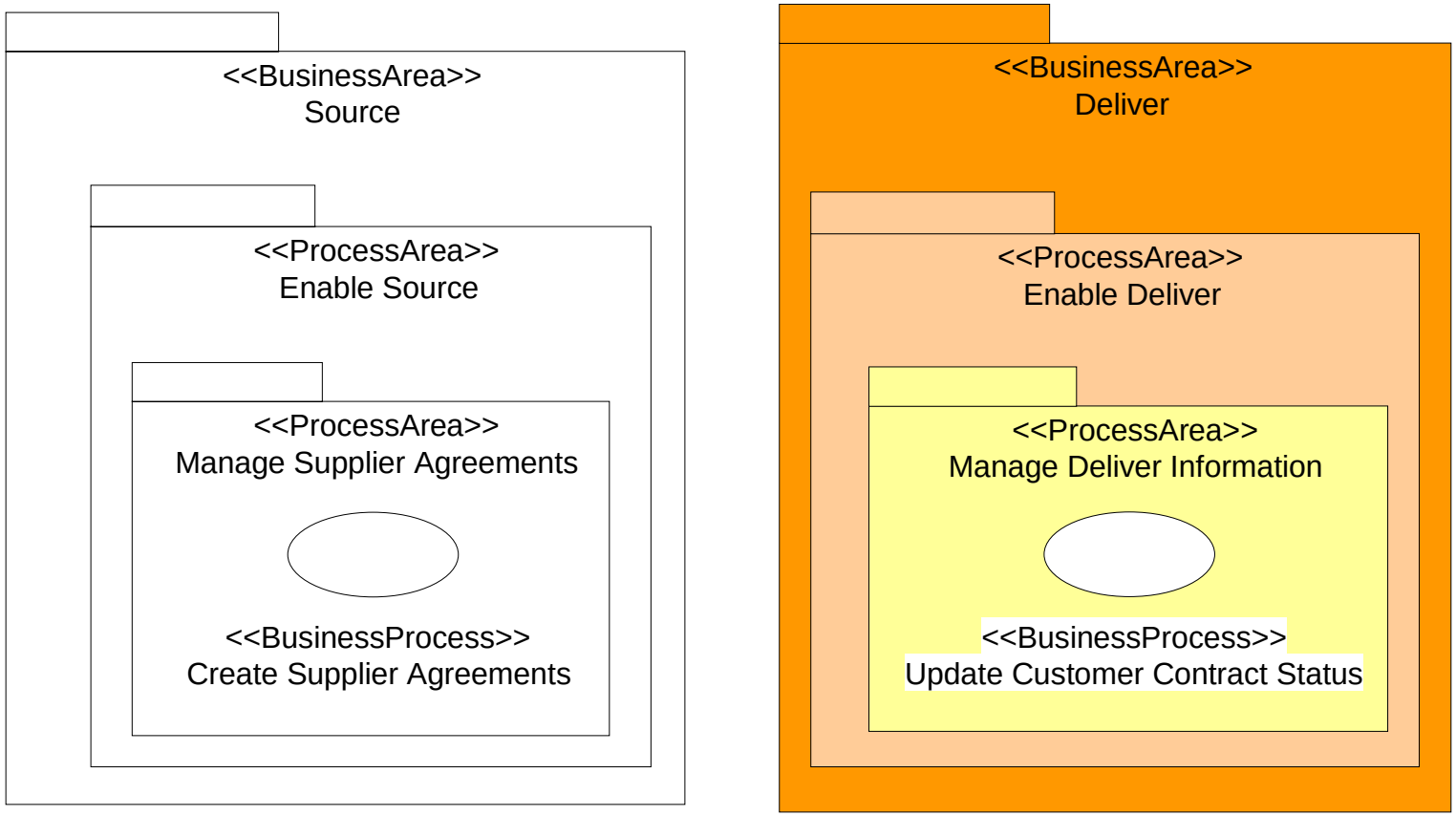


Model Views

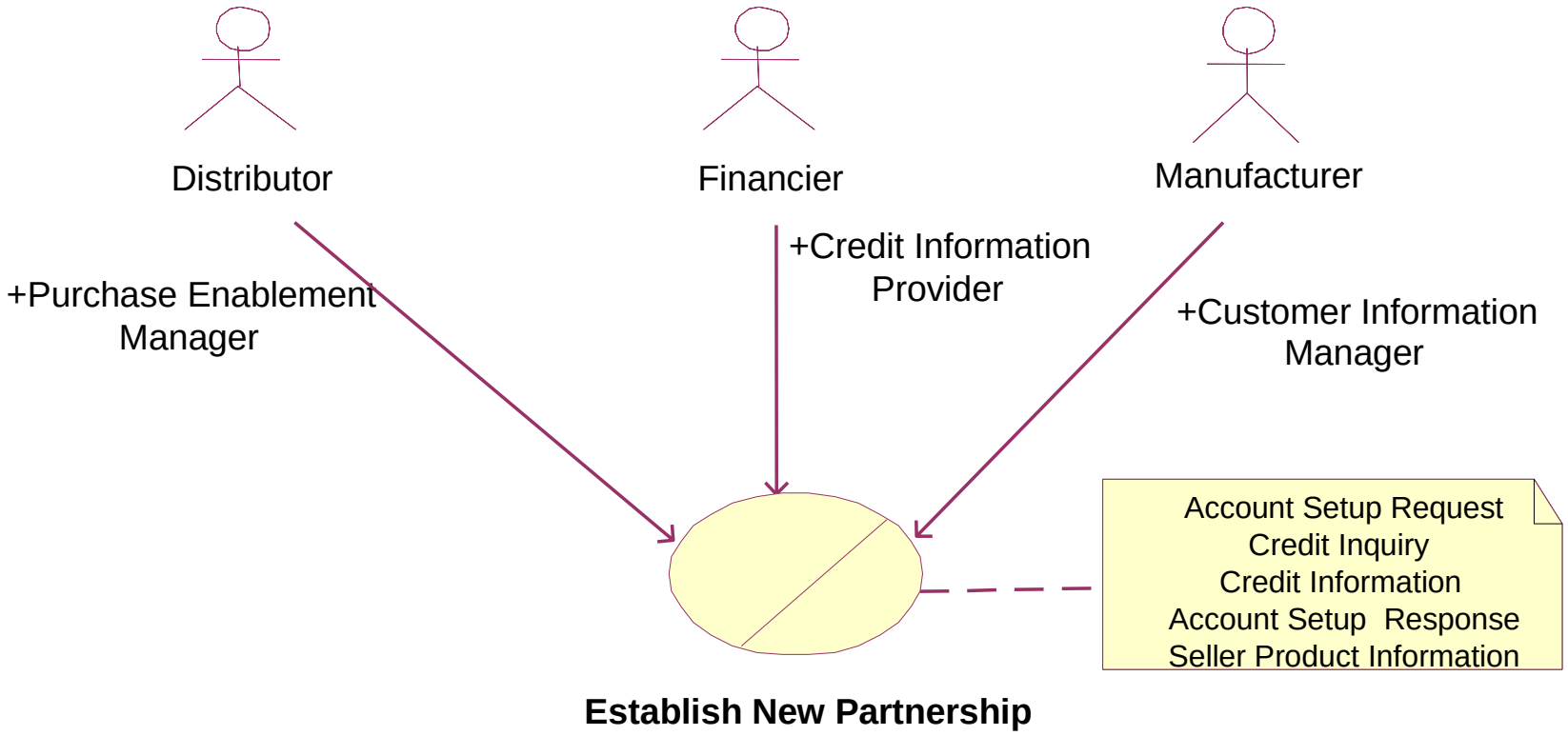
- **Business Operations Map (BOM)**
- **Business Requirements View (BRV)**
- **Business Transaction View (BTV)**
- **Business Service View (BSV)**



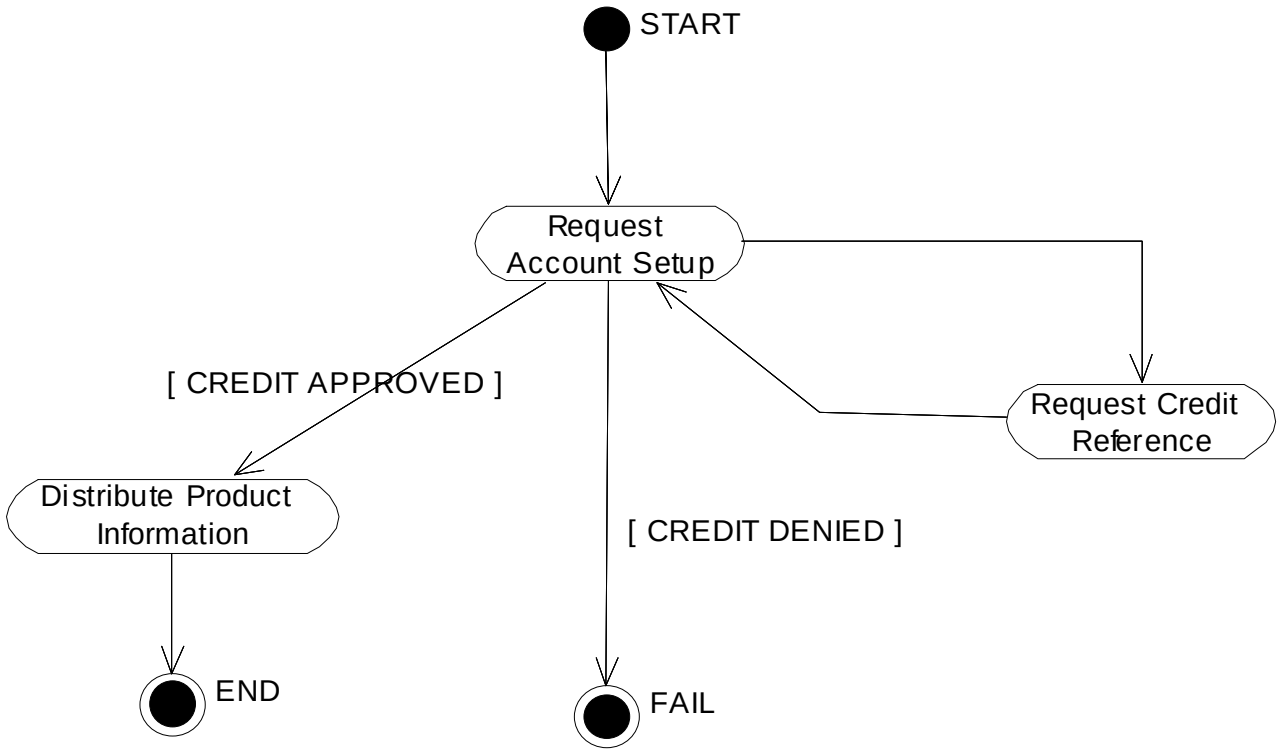
Business Operations Map



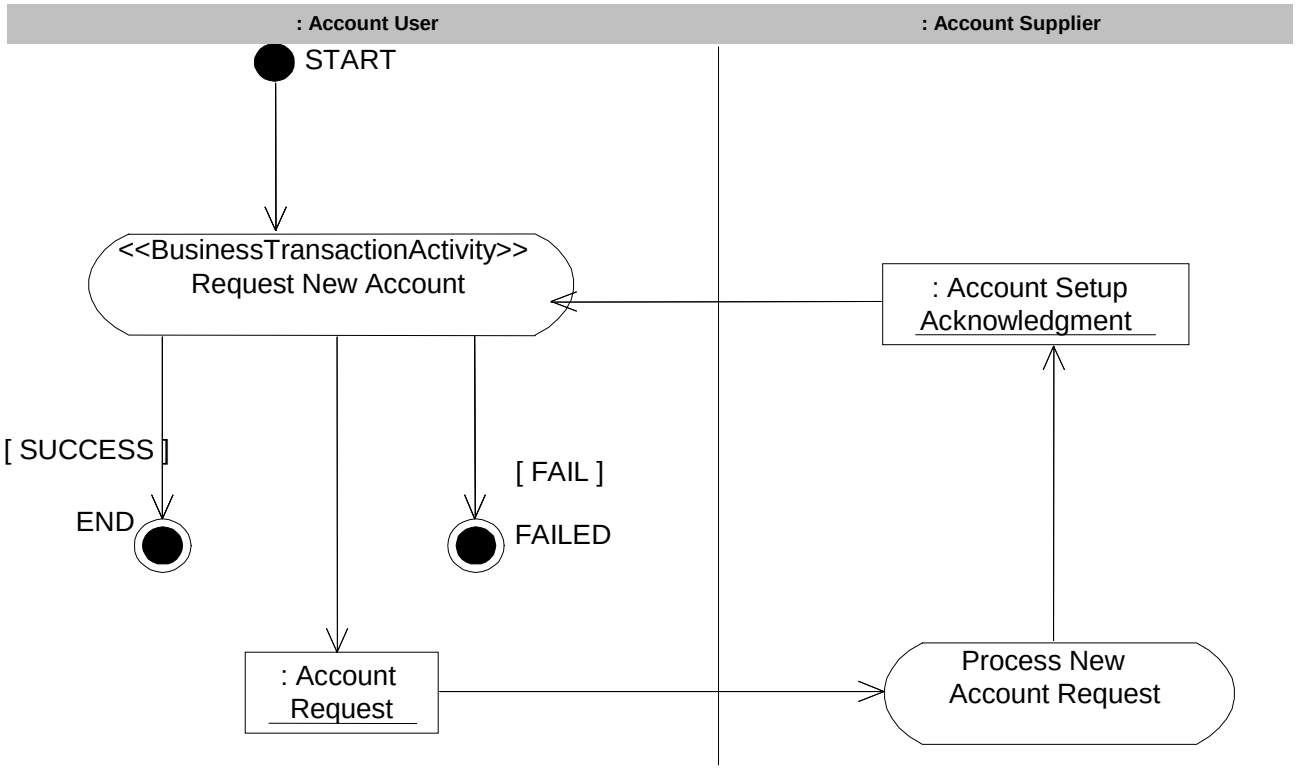
Business Requirements View



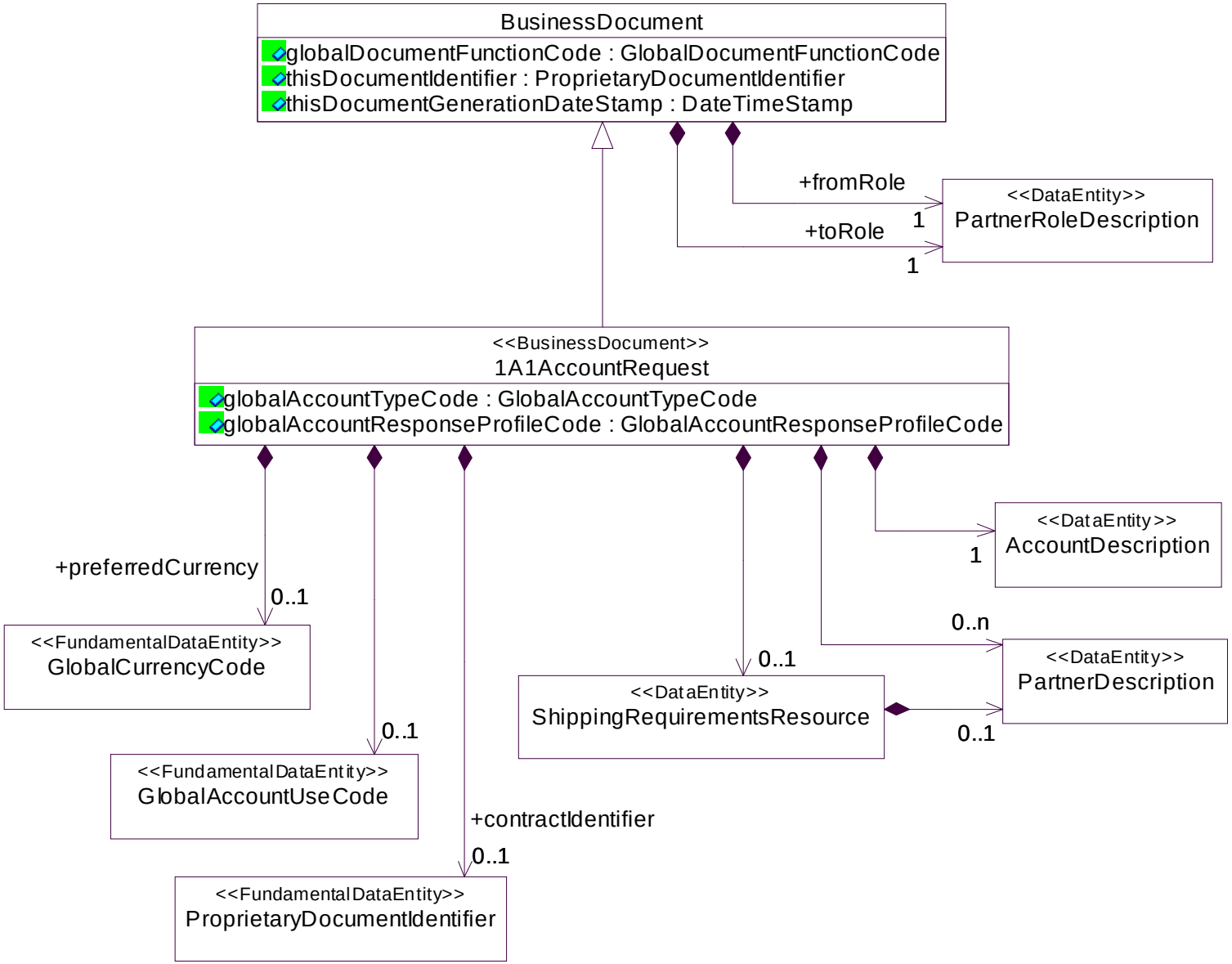
Business Transaction View: Business Collaboration



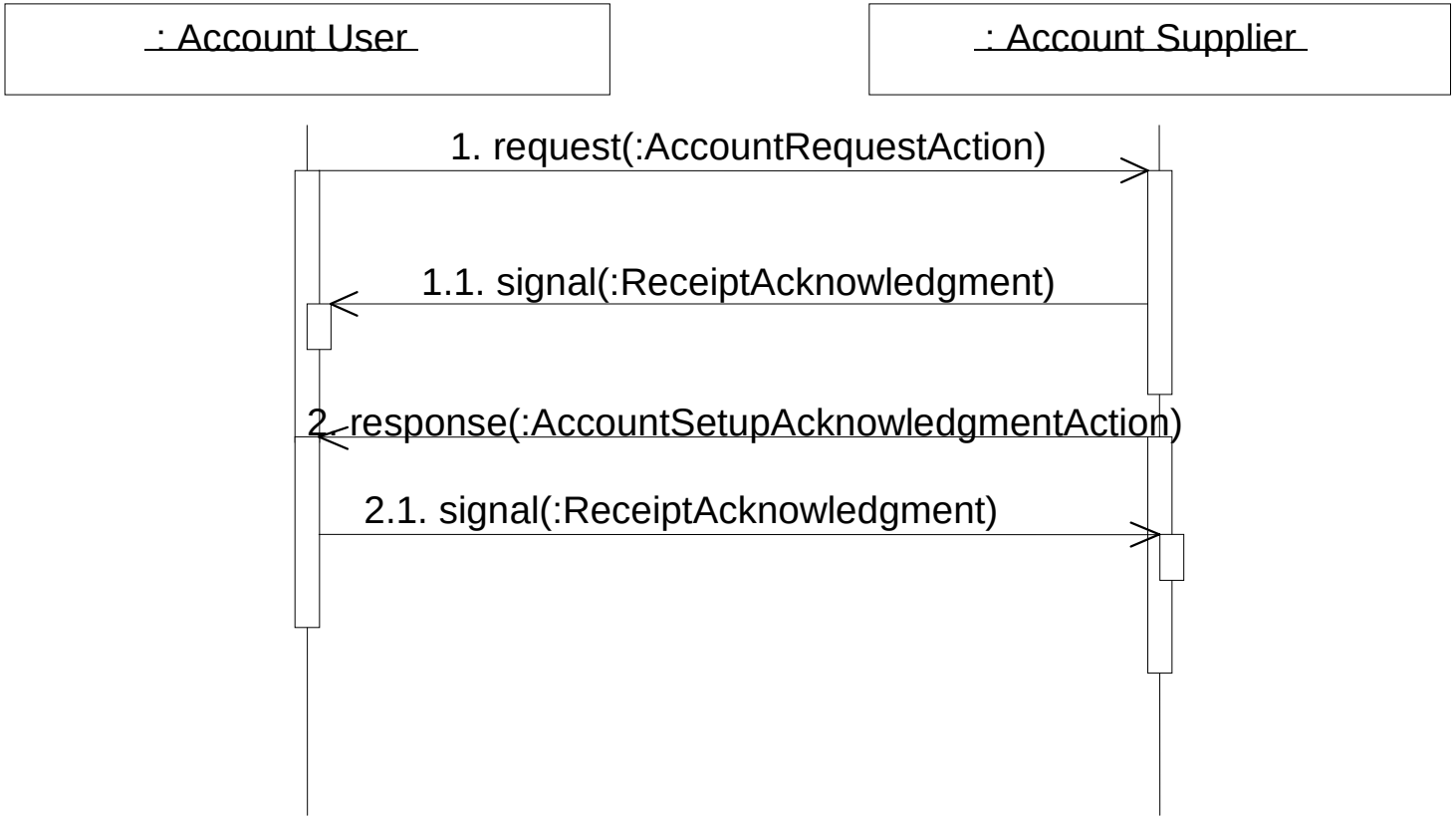
Business Transaction View: Business Transaction



Business Transaction View: Info Structure

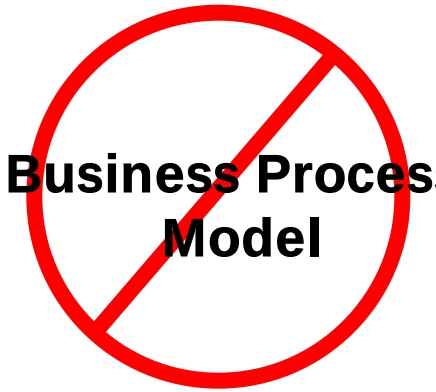


Business Service View



Business Collaboration Model

A prescription of the business and network protocols between independent business processes that permit the legally enforceable formation of commercial contracts between independent entities



Not a Business Process Model

It describes a particular set of interactions between two or more business process models provided by independent business entities that collaborate to reach common or complementary goals.

Business Collaboration Service

Edifecs provides a service where business partners elaborate, execute and optimize competitive and differentiated value network business models

Elaboration Method

- **Business Collaboration Framework (BCF)**
  - **UML/OCL metamodel**
  - **Flow and information patterns**
  - **Modeling methodology**
  - **UML and XML style guides**
- **People –business analysts, business collaboration architects, process owners, enterprise architects**
- **UML/OCL→XML modeling tool**

UML/OCL Metamodel

Context	Viewpoint
Business Process Requirements	**Business Operations Map (BOM)**
Business Collaboration Requirements	**Business Requirements View (BRV)**
Commercial Transaction Protocol and Business Collaboration Protocol	**Business Transaction View (BTV)**
Functional Service Protocol	**Business Service View (BSV)**
Network Implementation Protocol	**Implementation Framework View (IFV)**

Requirements

Specification

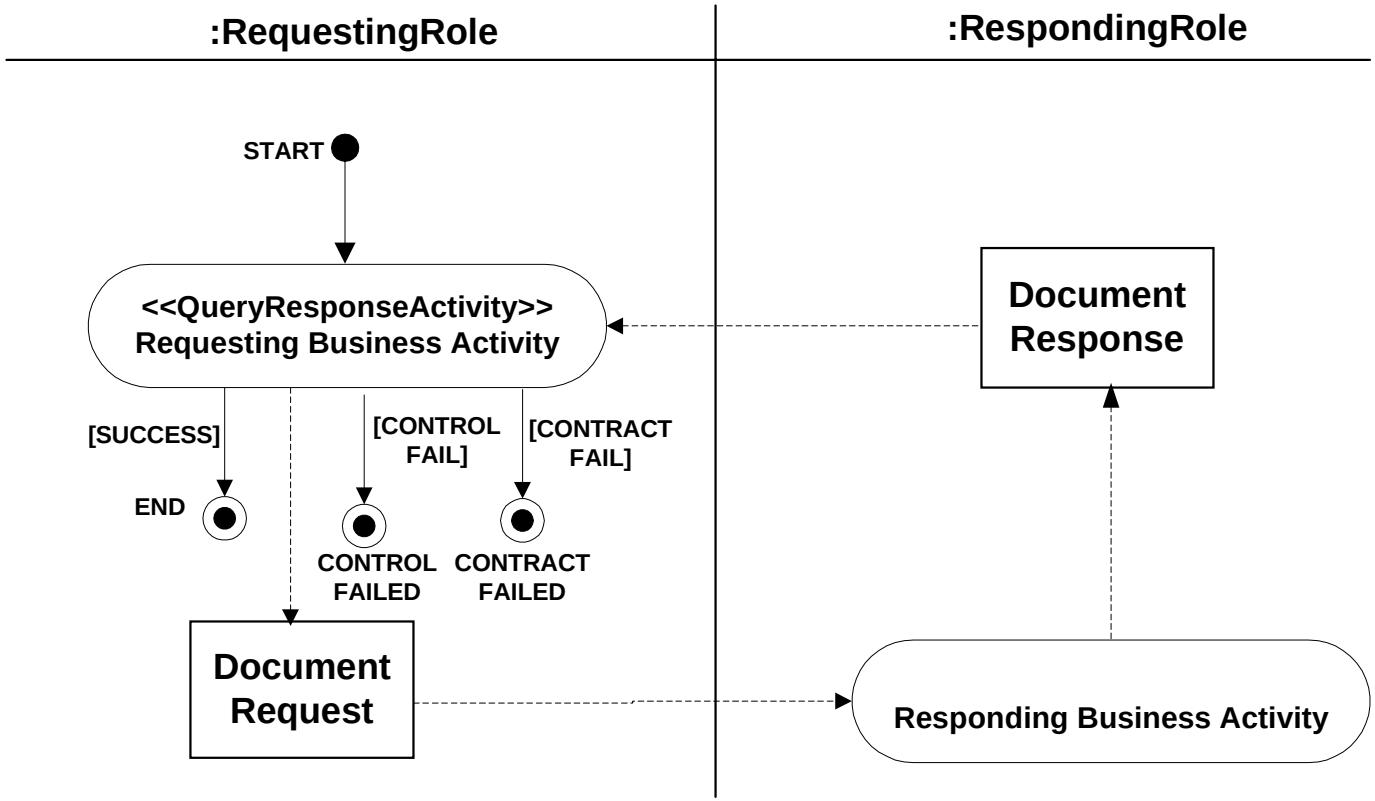
Design Patterns

- **Foster consistent specifications**
- **Foster consistent implementations**
- **Speed development**
- **Apply pervasively**
  - **Collaborations**
  - **Transactions**
  - **Information structures**

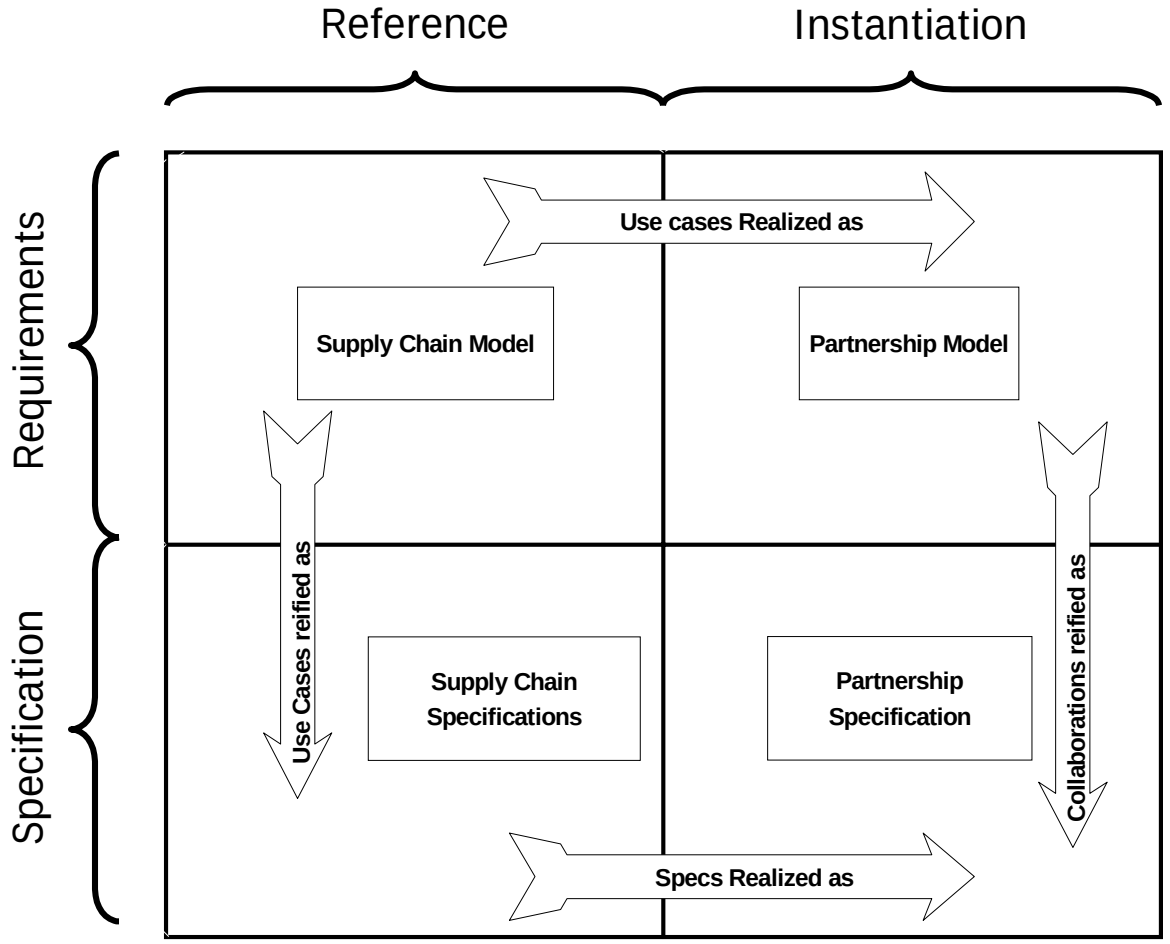
Patterns – syntax, semantics

- **Business Transaction**
- **Query/Response**
- **Information Distribution**
- **Request/Confirm**
- **Notification**
- **Request/Response**

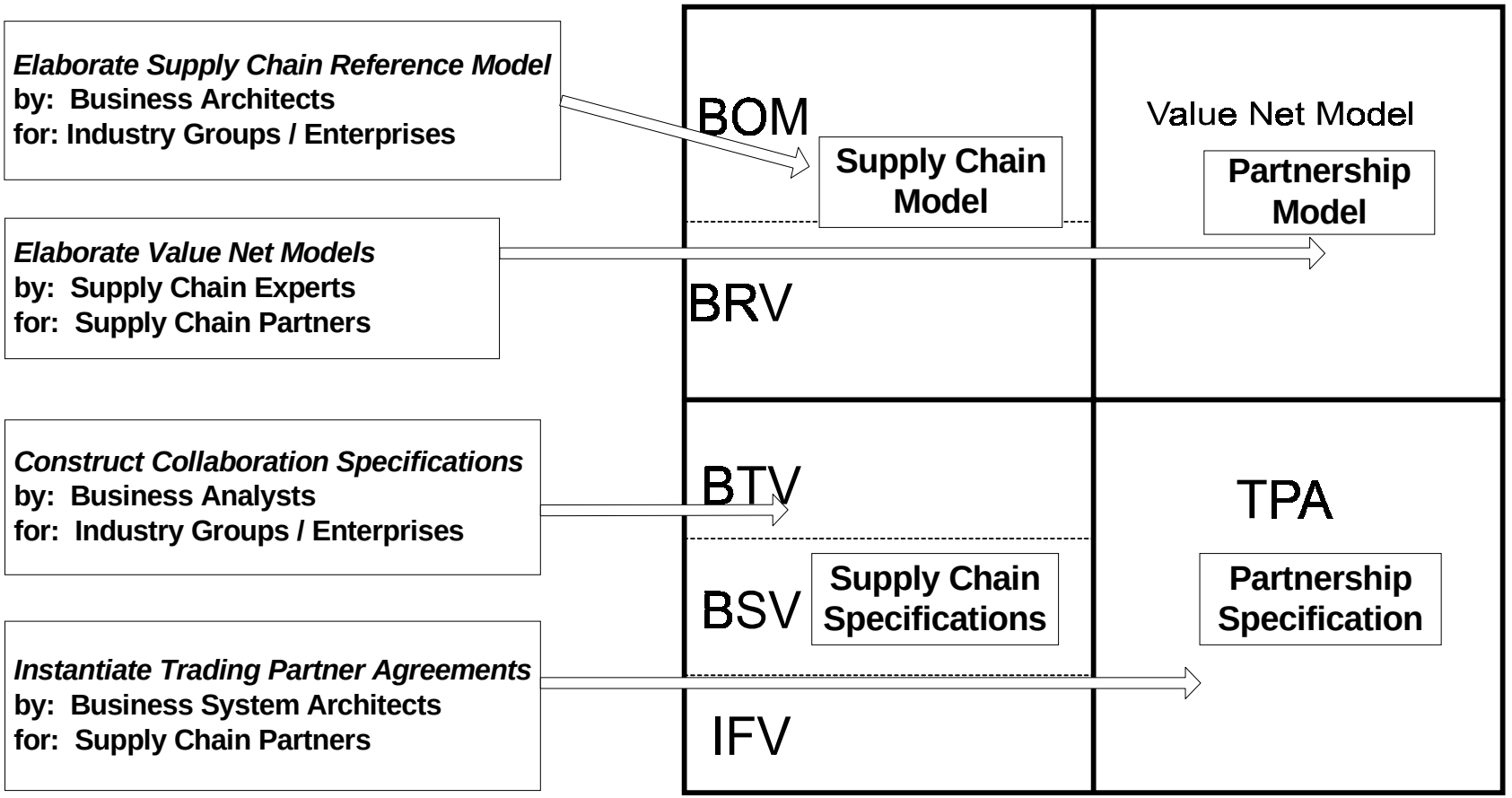
Query/response pattern - BTV



Elaboration Methodology

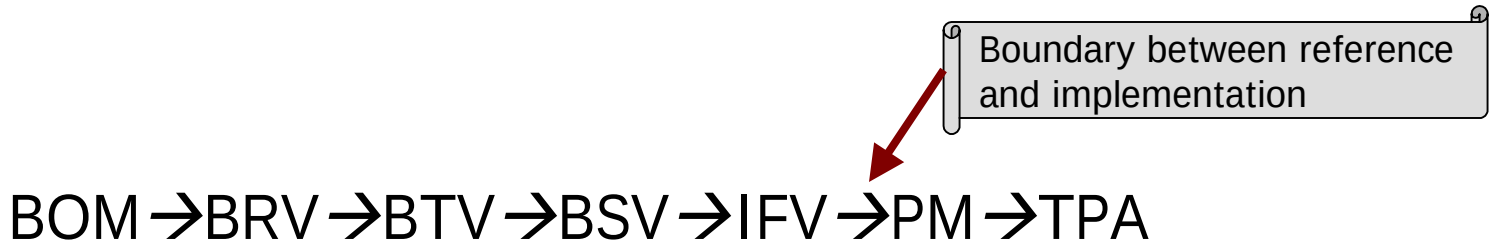


Participant Roles and BCF



Elaboration Example

- **Reference**
  - **Supply-Chain.Org reference model (SCOR) http://www.supply-chain.org**
  - **RosettaNet EConcert Scenario http://www.rosettanet.org**
    - **Establish New Partnership**
- **Instantiation**
  - **Partner Model**
  - **Trading Partner Agreement (TPA)**



BOM using SCOR

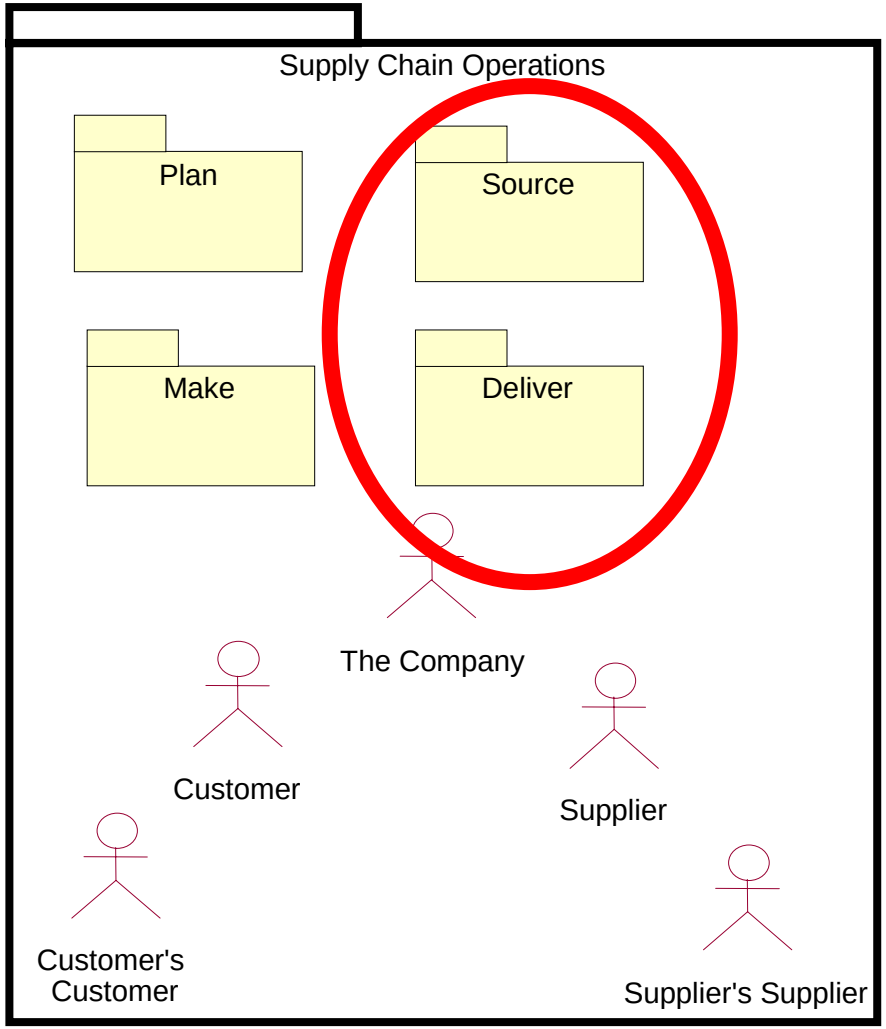
Business Areas:

- Plan
- Source
- Make
- Deliver

View Point == The Company

Models Recursive Interaction

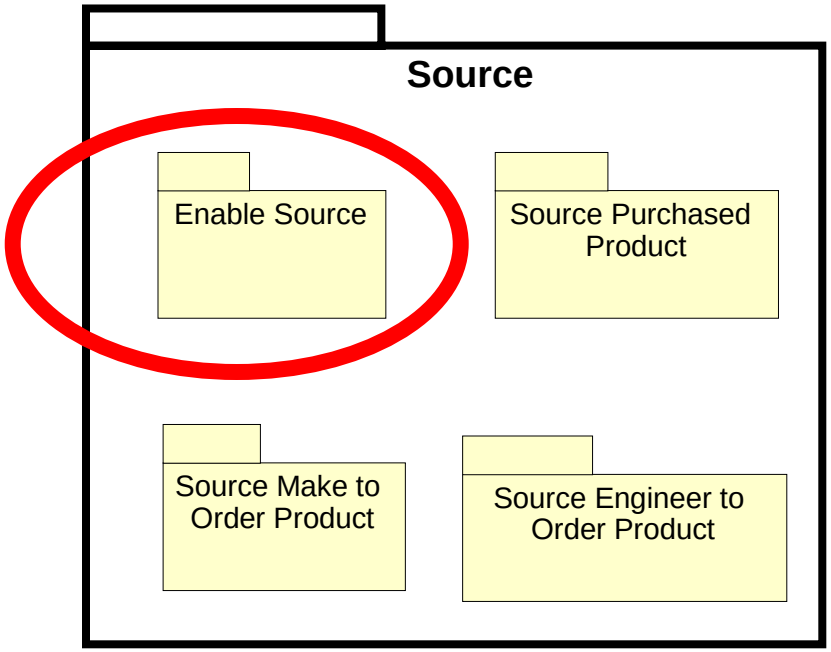
- Customer, Customer's Customer ....
- Supplier, Supplier's Supplier ....



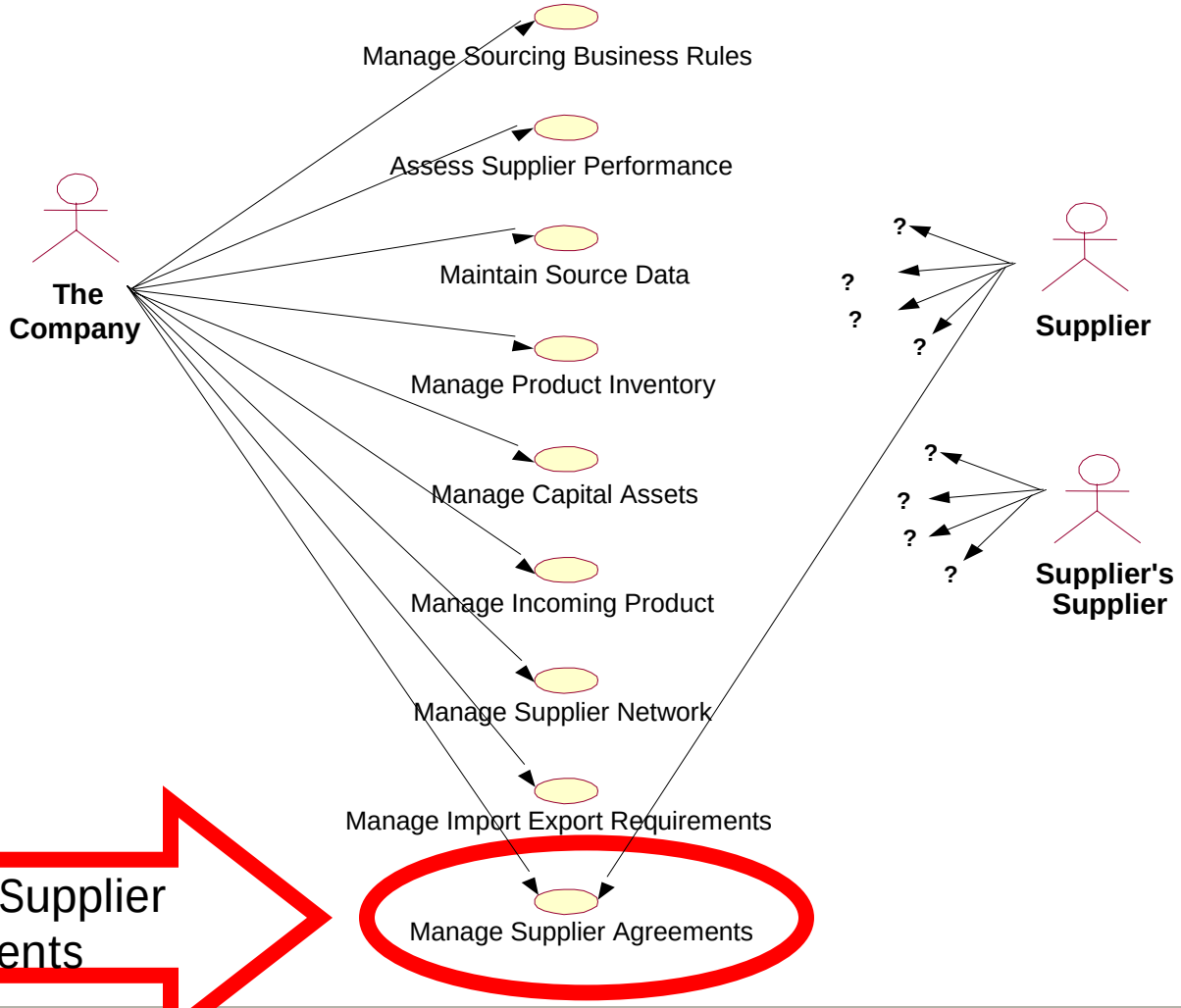
BOM - source drill down

Process Areas:

- Enable Source
- Source Purchased Product
- Source Make to Order Product
- Source Engineer to Order Product



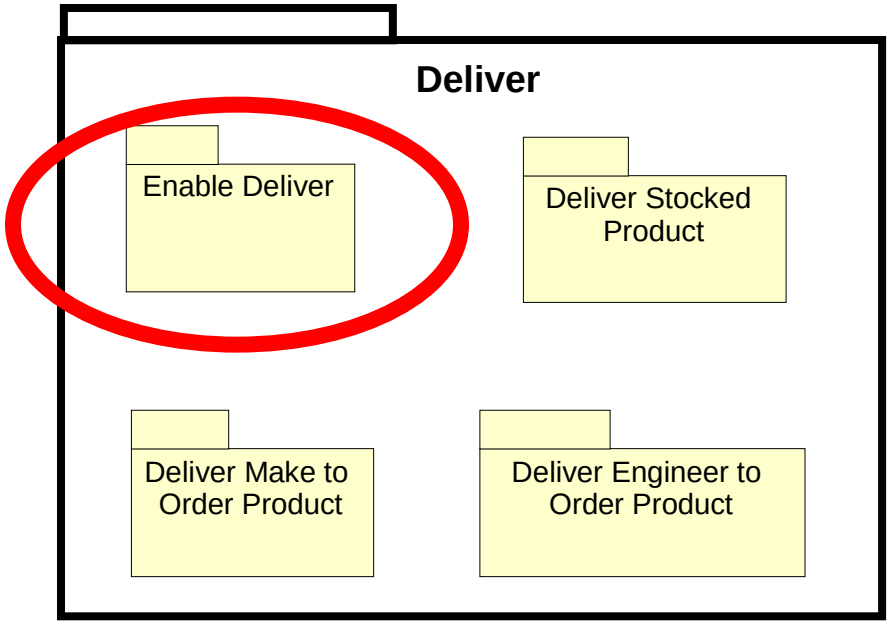
BOM - enable source drill down



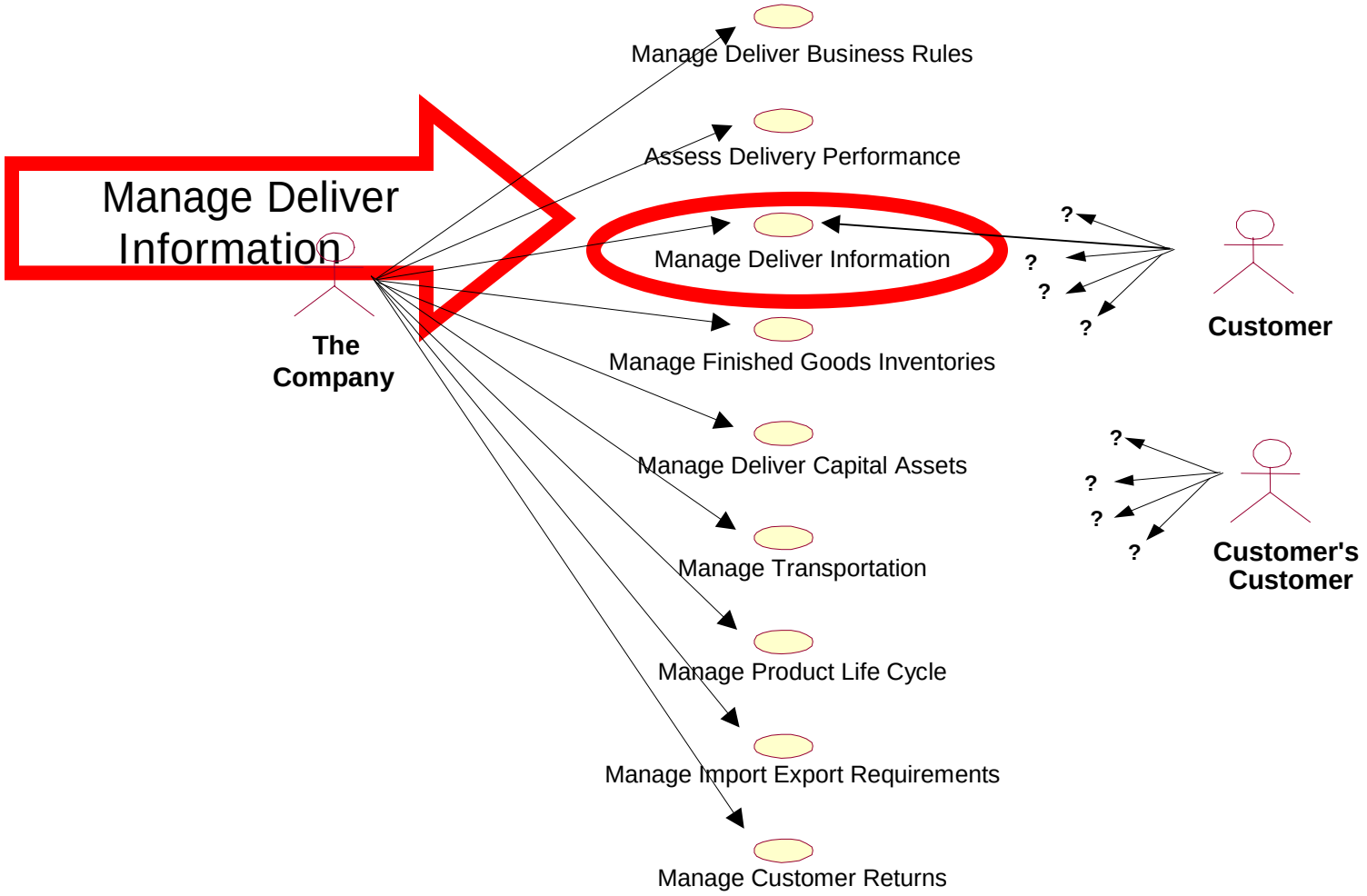
BOM - deliver drill down

Process Areas:

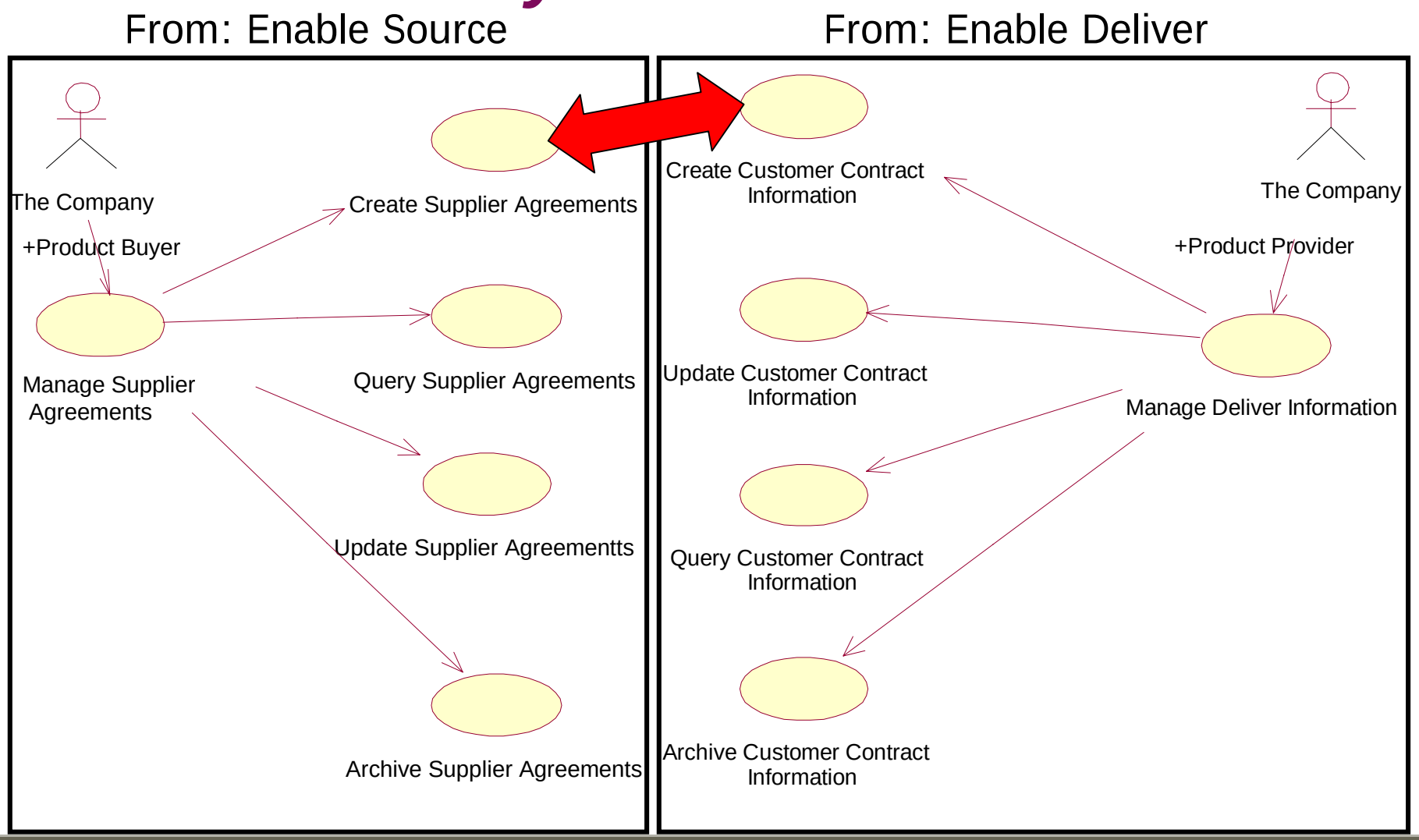
- Enable Deliver
- Deliver Stocked Product
- Deliver Make to Order Product
- Deliver Engineer to Order Product



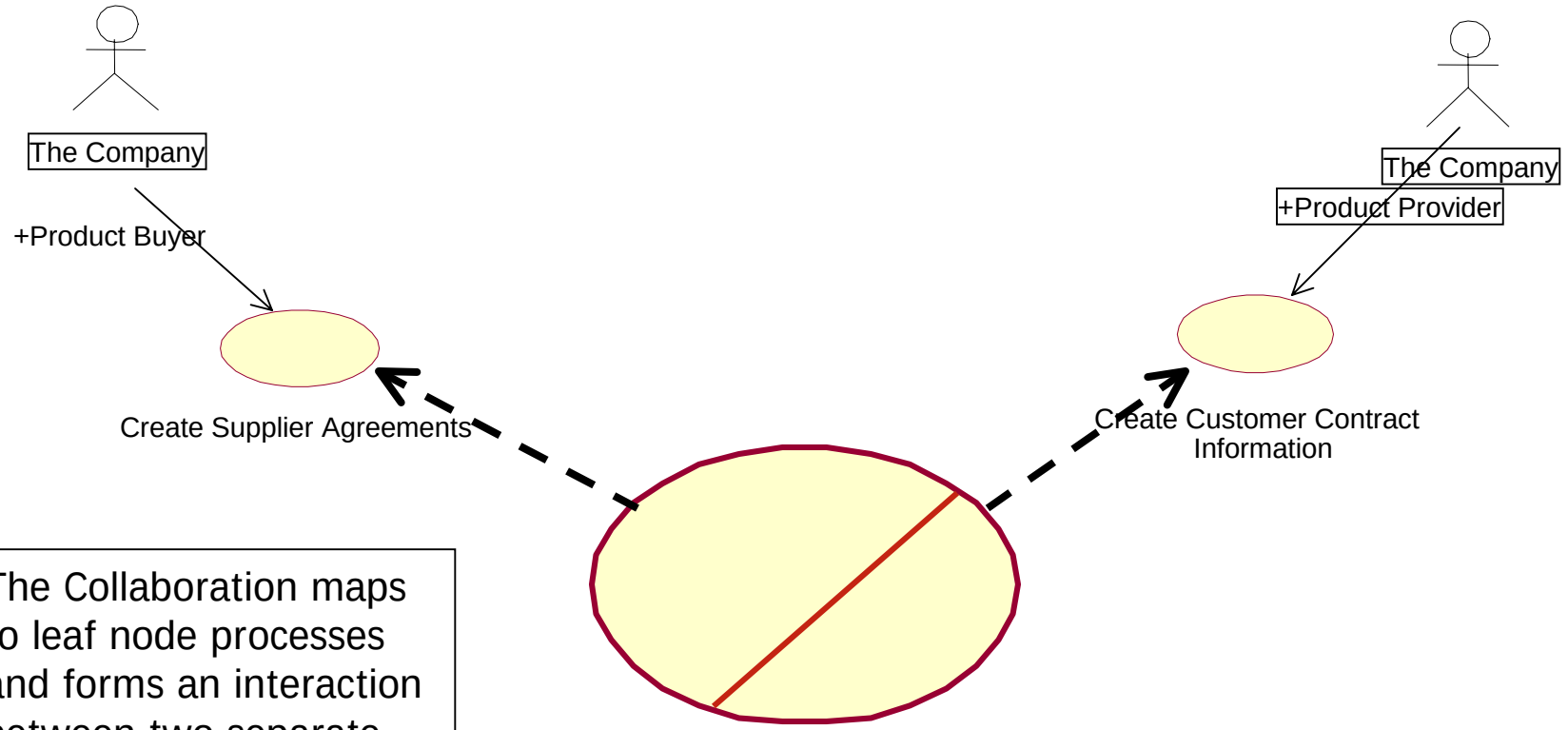
BOM – enable deliver drill down



BOM – identify collaboration

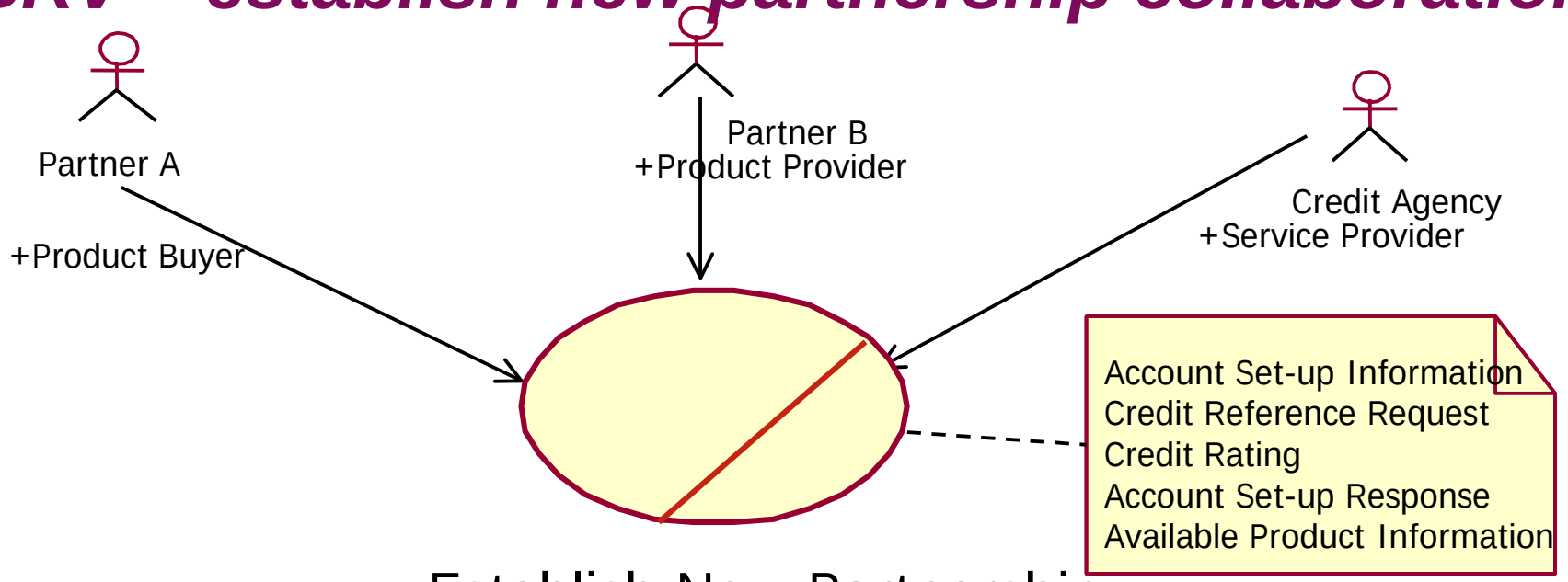


BOM->BRV – map collaboration to processes



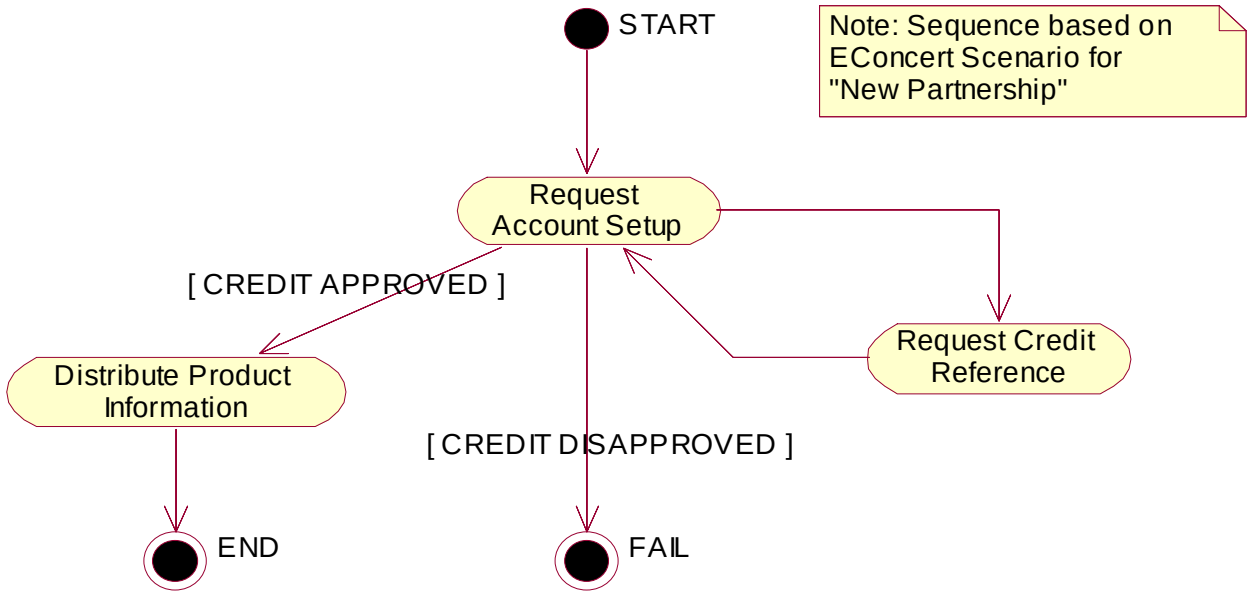
The Collaboration maps to leaf node processes and forms an interaction between two separate supply chain operations models.

BRV – establish new partnership collaboration



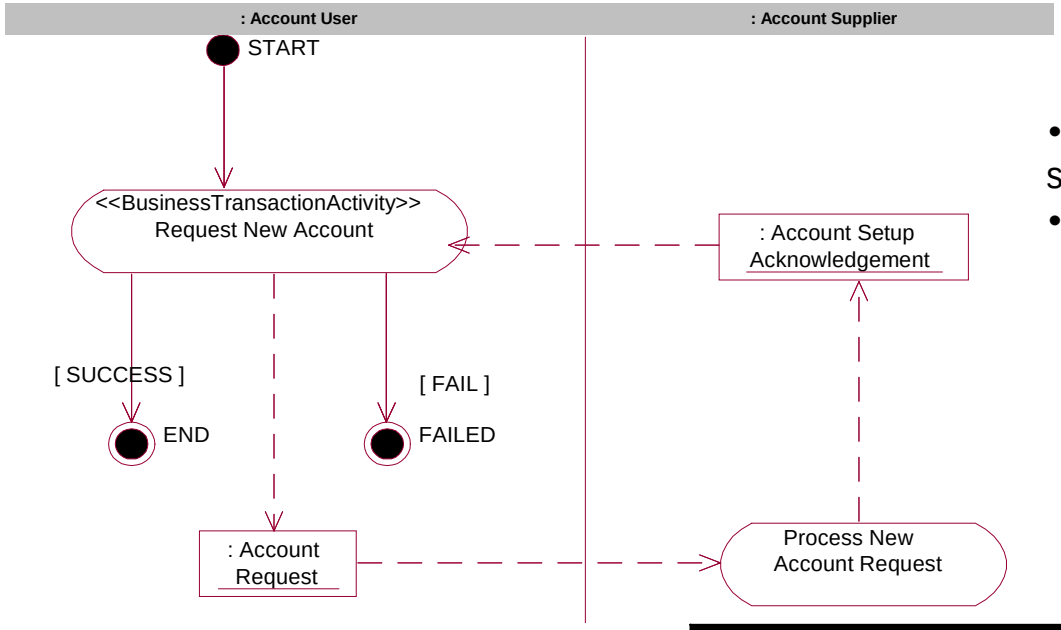
The BRV Diagram shown here sets the scope for a “fully-elaborated” use case description. The use case definition (a.k.a. steps or events) are then detailed in an activity diagram as the top level of the BTV.

BTV – business collaboration protocol



The Diagram shown here connects the set of transactions which together define a Business Collaboration Protocol at the Business Transaction View (BTV) level. This diagram represents the top level of the BTV. Each transaction is then decomposed according to its appropriate pattern.

BTV – commercial transaction

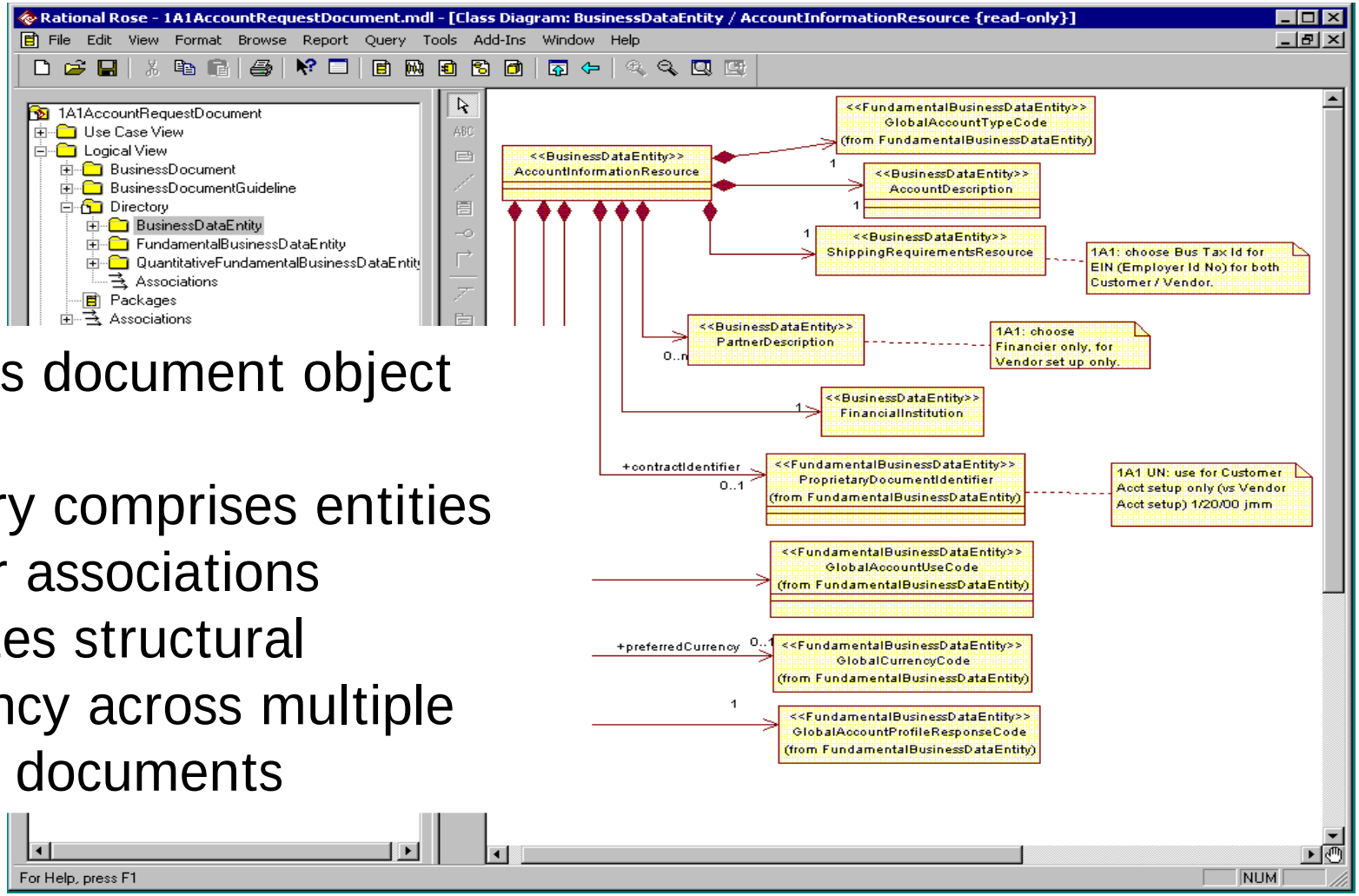


- Well defined business transaction semantics
- Business-oriented view

Table 2-3: Business Activity Performance Controls

Role Name	Activity Name	Acknowledgment of Receipt: Non-Repudiation Required?	Acknowledgment of Receipt: Time to Acknowledge	Time to Acknowledge Acceptance	Time to Perform	Retry Count	Is Authorization Required?	Non-Repudiation of Origin and Content?
Account User	Request New Account	Y	2hr	24hr	24hr	3	Y	Y

BTV – directory

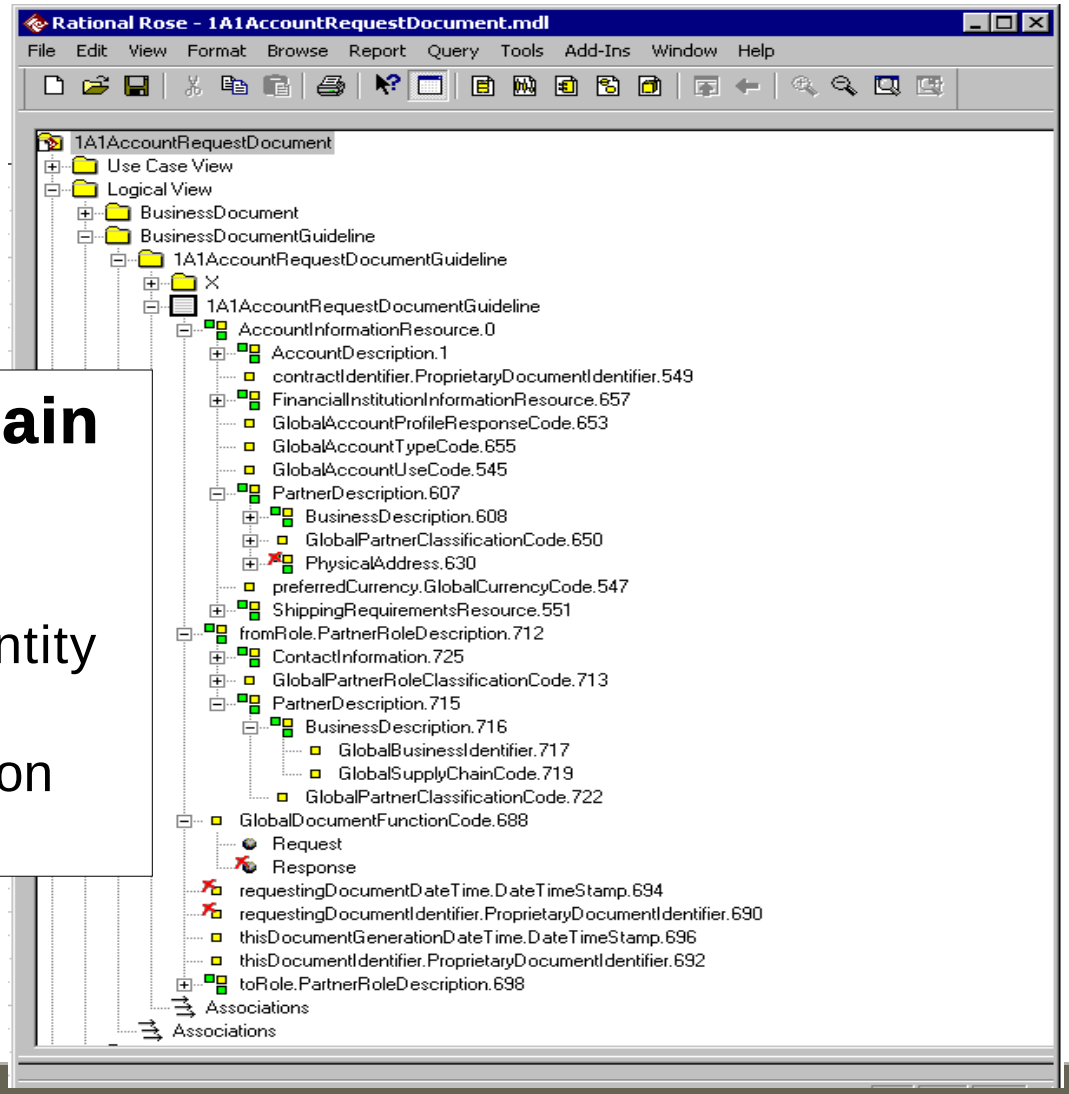


- Business document object model
- Directory comprises entities and their associations
- Facilitates structural consistency across multiple business documents

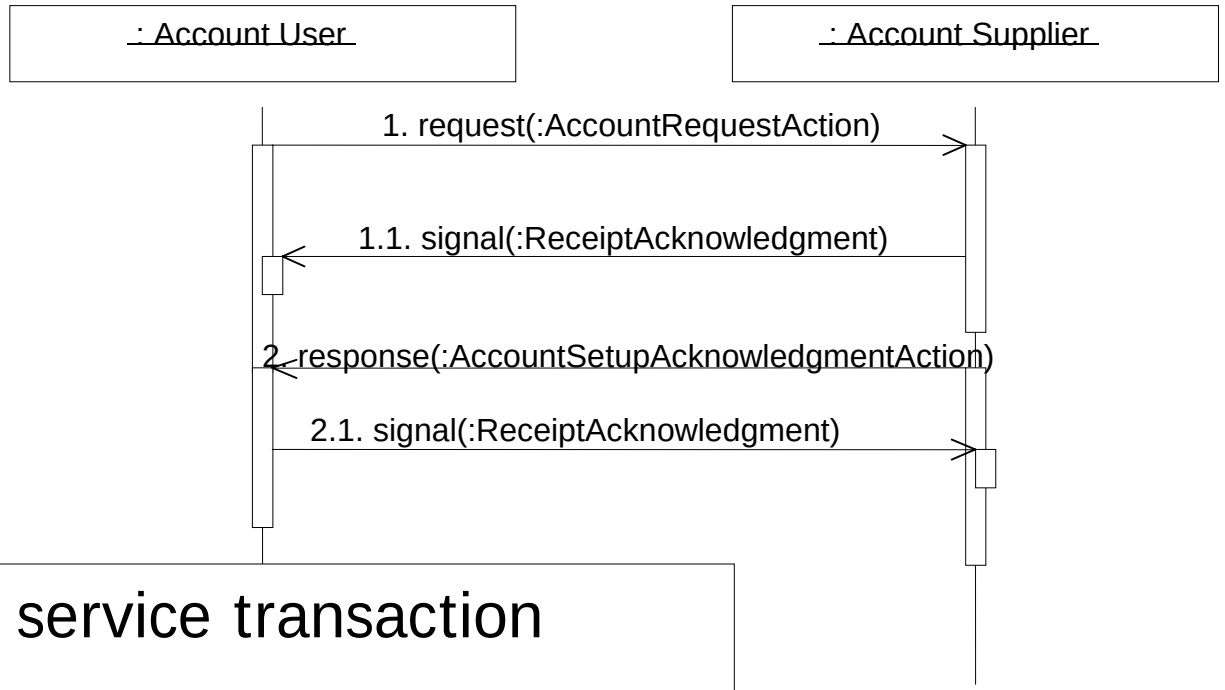
BTV – business document

Contextually constrain business document composition

- Include attributes of an entity only where appropriate
- Content validation based on usage context

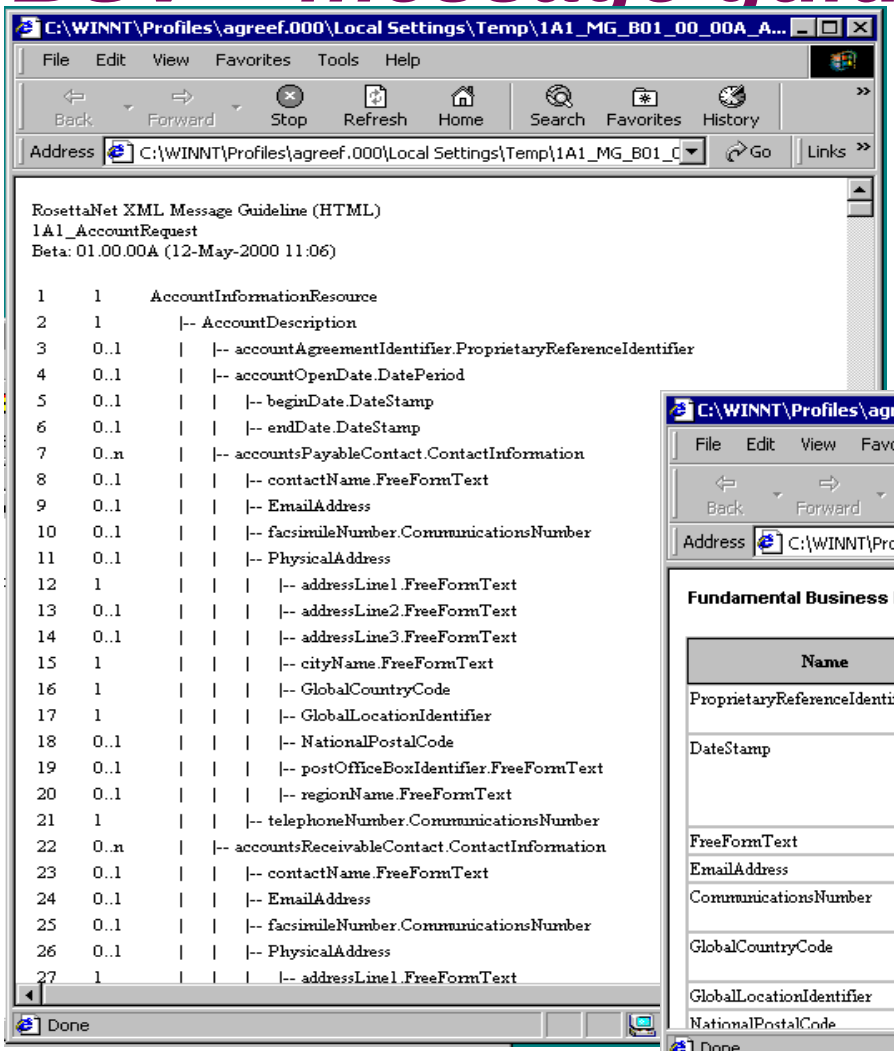


BSV – server-to-server

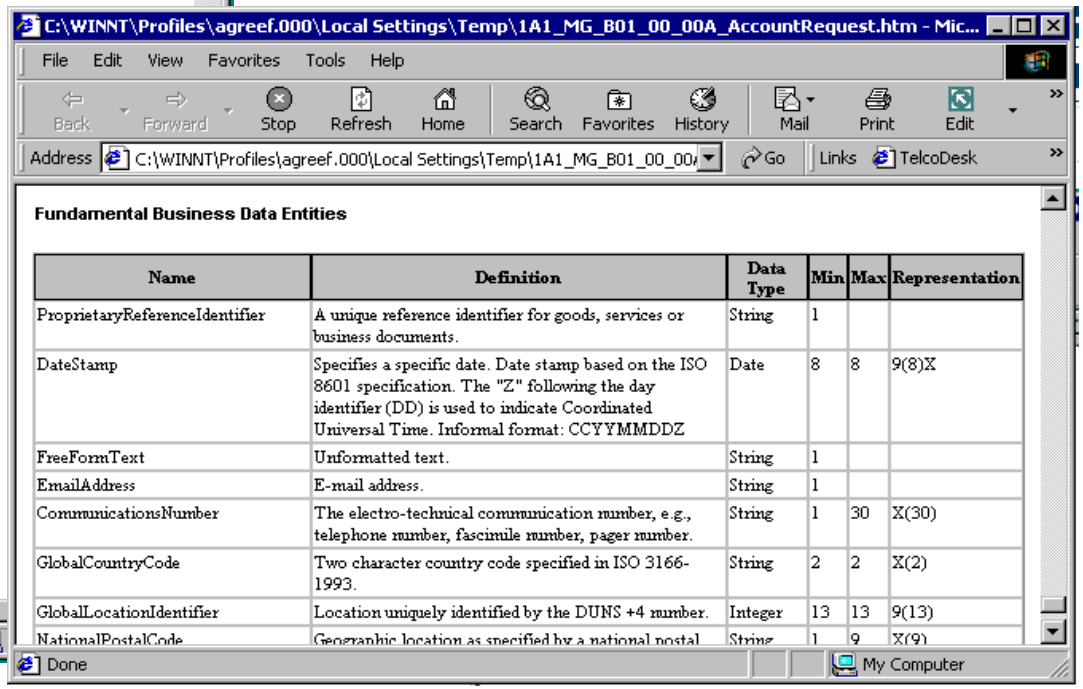


- Well defined service transaction semantics
- Transaction state transitions are pattern based
- Technically oriented view

BSV – message guideline



- Business document structure
- Data definition e.g. min,max, lexical representation, data type
- Validation constraints
- Consistent entity structure



Name	Definition	Data Type	Min	Max	Representation
ProprietaryReferenceIdentifier	A unique reference identifier for goods, services or business documents.	String	1		
DateStamp	Specifies a specific date. Date stamp based on the ISO 8601 specification. The "Z" following the day identifier (DD) is used to indicate Coordinated Universal Time. Informal format: CCYYMMDDZ	Date	8	8	9(8)X
FreeFormText	Unformatted text.	String	1		
EmailAddress	E-mail address.	String	1		
CommunicationsNumber	The electro-technical communication number, e.g., telephone number, fascimile number, pager number.	String	1	30	X(30)
GlobalCountryCode	Two character country code specified in ISO 3166-1993.	String	2	2	X(2)
GlobalLocationIdentifier	Location uniquely identified by the DUNS +4 number.	Integer	13	13	9(13)
NationalPostalCode	Geographic location as specified by a national postal	String	1	9	X(9)

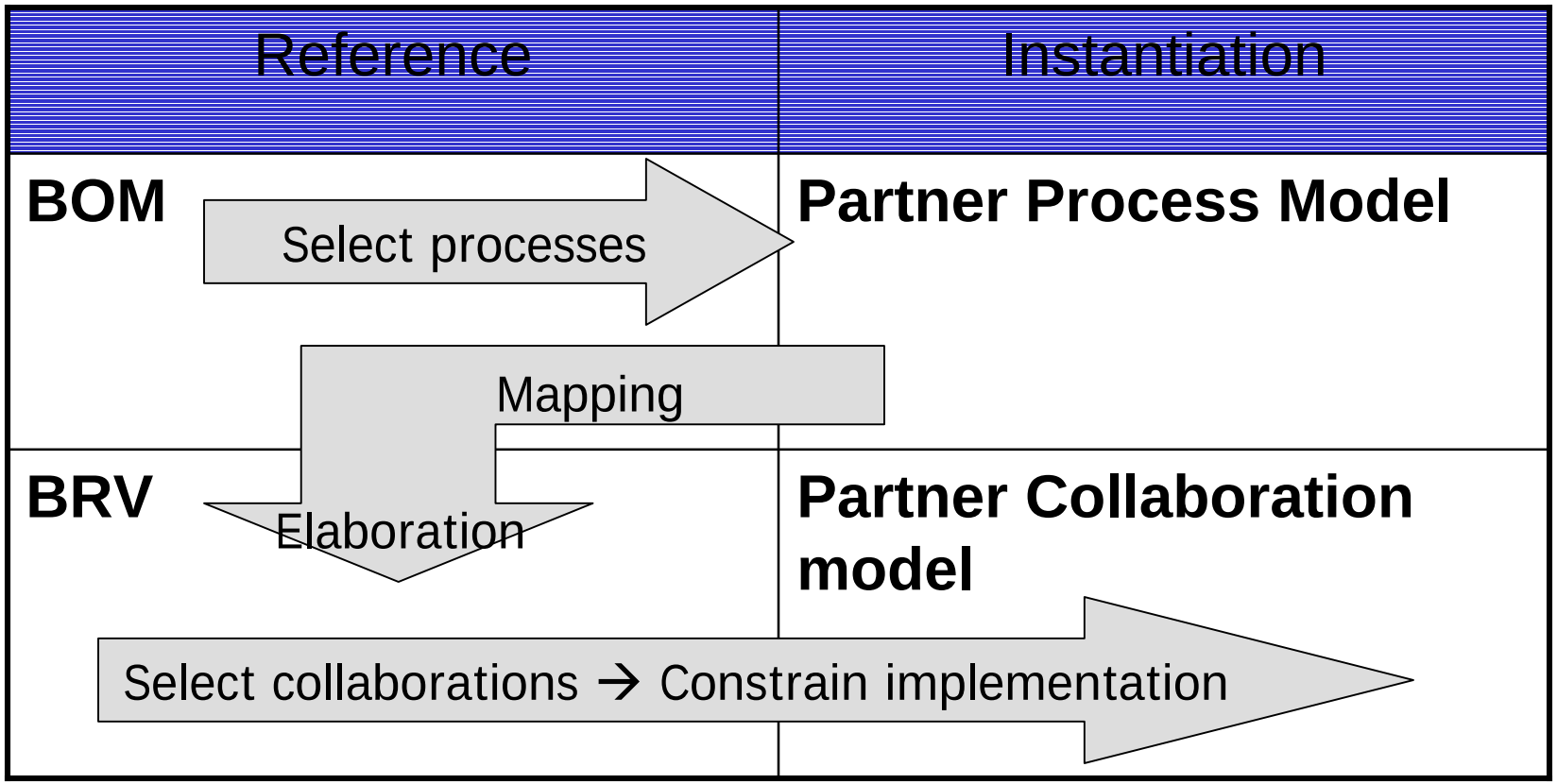
IFV – XML message schema

- DTD today
- XML-Schema when standard
- Used to validate messages
- Guideline needed for constraints

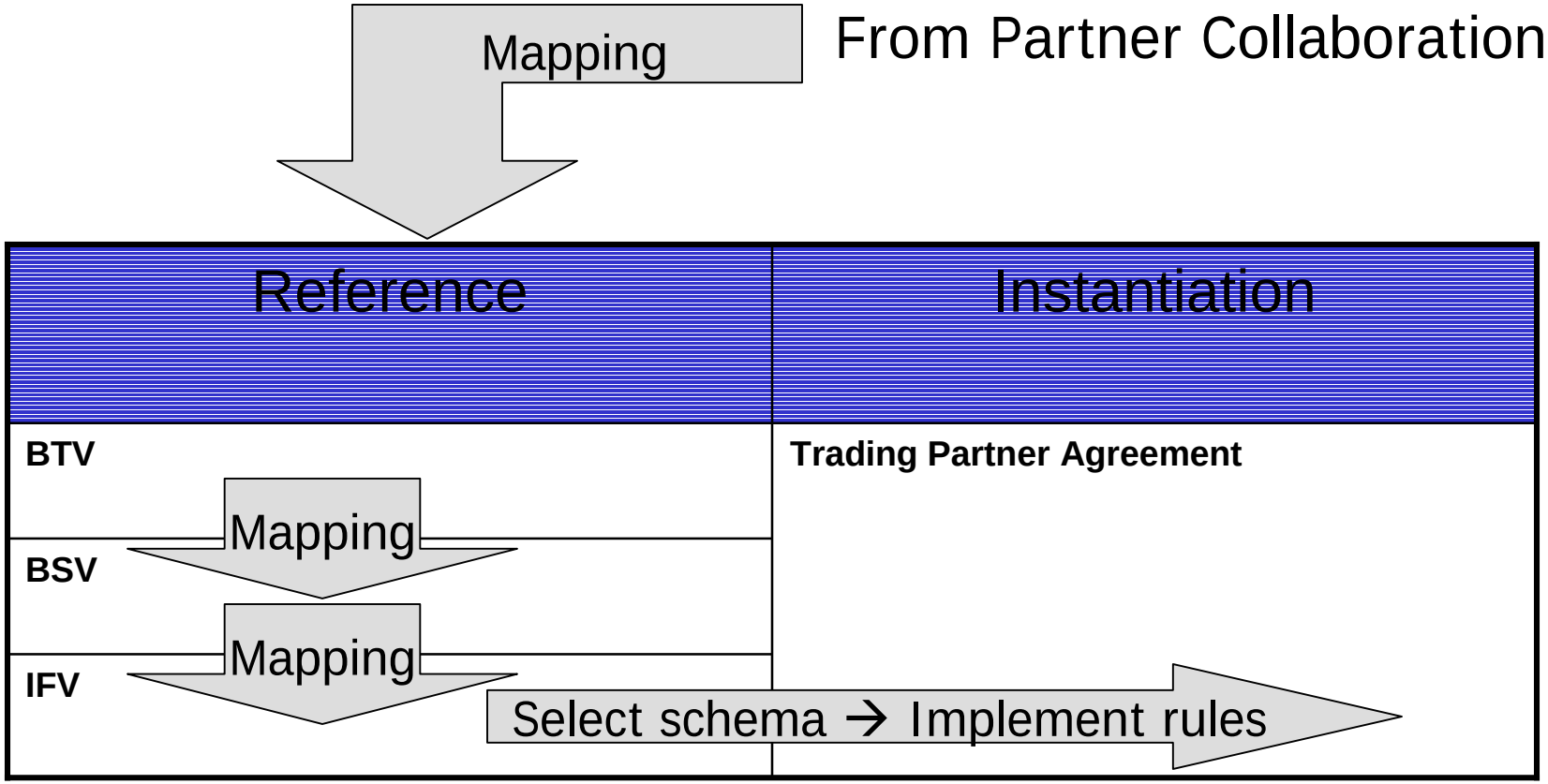
```
<!ELEMENT Pip1A1AccountRequest (
        AccountInformationResource ,
        fromRole ,
        GlobalDocumentFunctionCode ,
        thisDocumentGenerationDateTime ,
        thisDocumentIdentifier ,
        toRole ) >

<!ELEMENT AccountInformationResource (
        AccountDescription ,
        contractIdentifier? ,
        FinancialInstitutionInformationResource ,
        GlobalAccountProfileResponseCode ,
        GlobalAccountTypeCode ,
        GlobalAccountUseCode? ,
        PartnerDescription* ,
        preferredCurrency? ,
        ShippingRequirementsResource? ) >
```

Partner model



Trading Partner Agreement

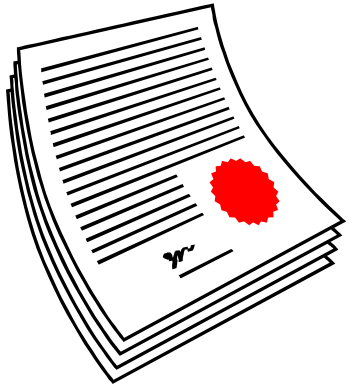


BOM→BRV→BTV→BSV→IFV→PM→TPA

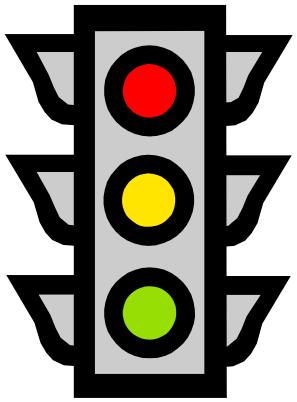
Choreography

- **Orchestrate exchange among partners**
- **Internal processes (private)**
- **External collaborations (public)**

Information Exchange

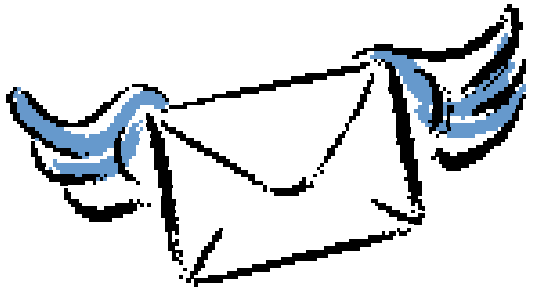


- **Actions**
  - **Business requests and responses**
  - **Represented by business documents**
- **Signals**
  - **Acknowledgements**
  - **Error reports**



Messages

- **Actions and signals in transit**
  - **Headers and body**
  - **Constrained by grammar**
  - **Aligned with vocabulary**
- **Grammar**
  - **Schema**
  - **Guidelines**
- **Vocabulary**
  - **Dictionaries**
  - **Codes**



Coordination

- **Timeouts**
- **Retries**
- **Retry intervals**

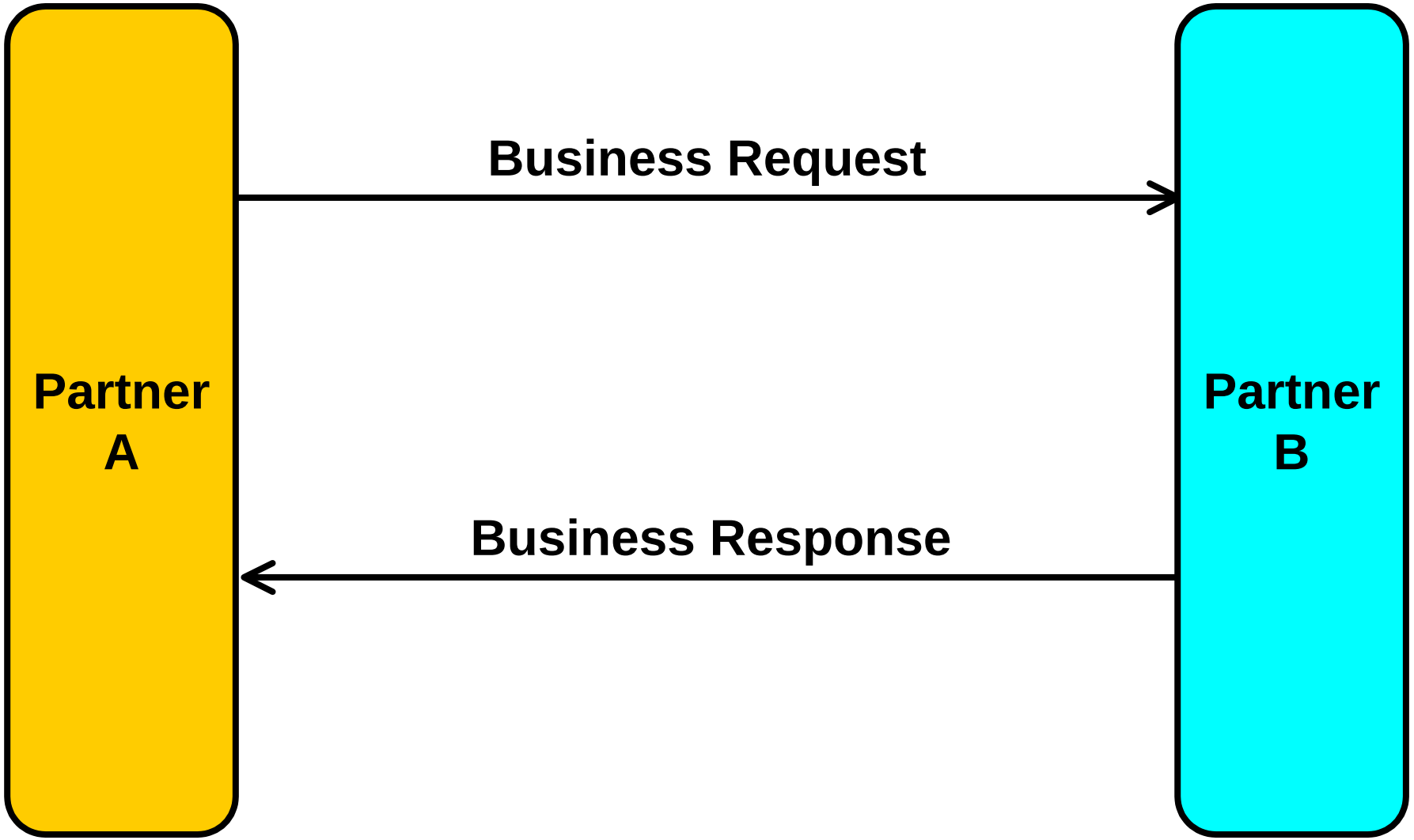
… robust <u>state alignment</u> across partners

Security Considerations

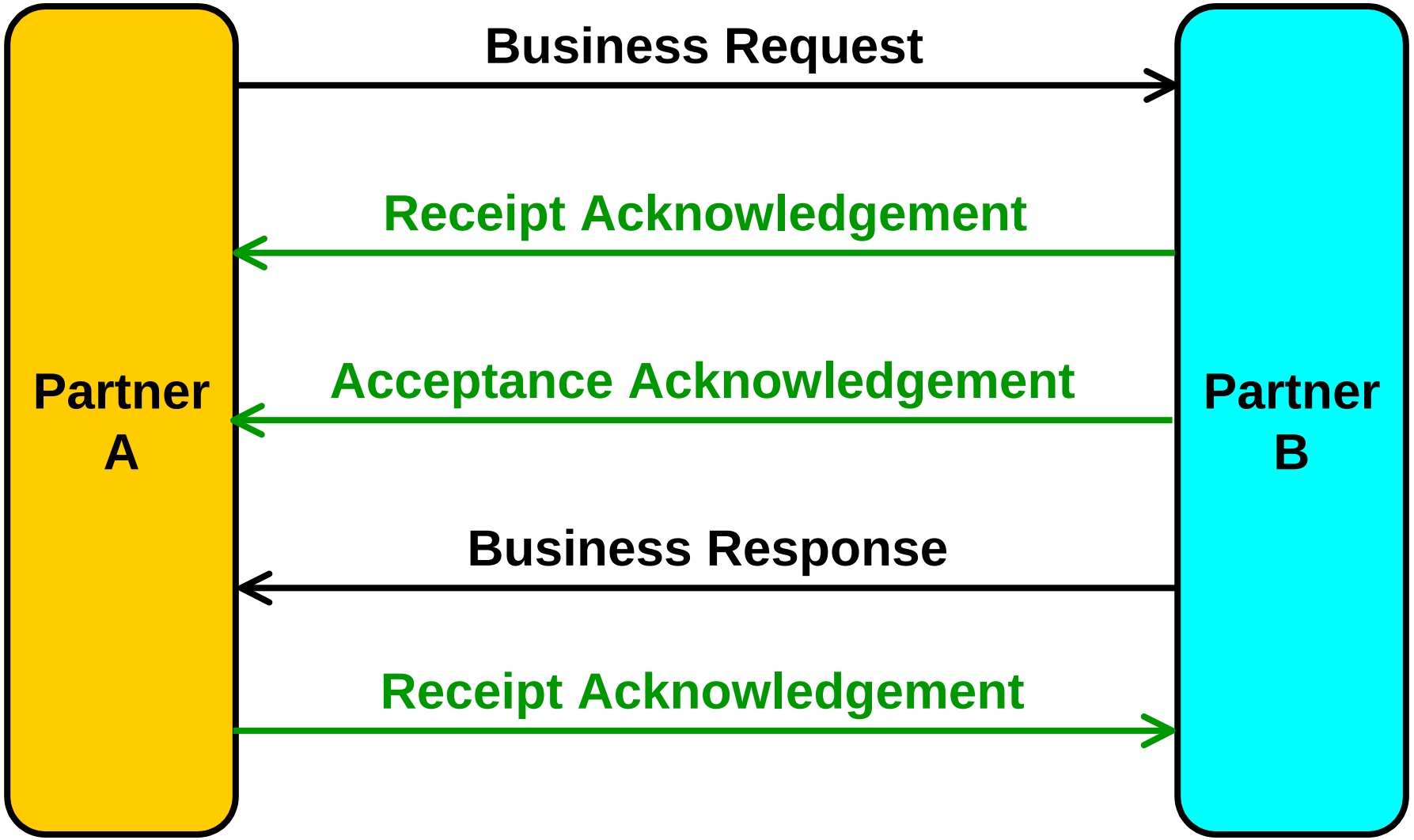
- **Confidentiality**
- **Integrity**
- **Authentication**
- **Authorization**
- **Non-repudiation**
  - **Origin**
  - **Receipt**

… policies embodied in a framework

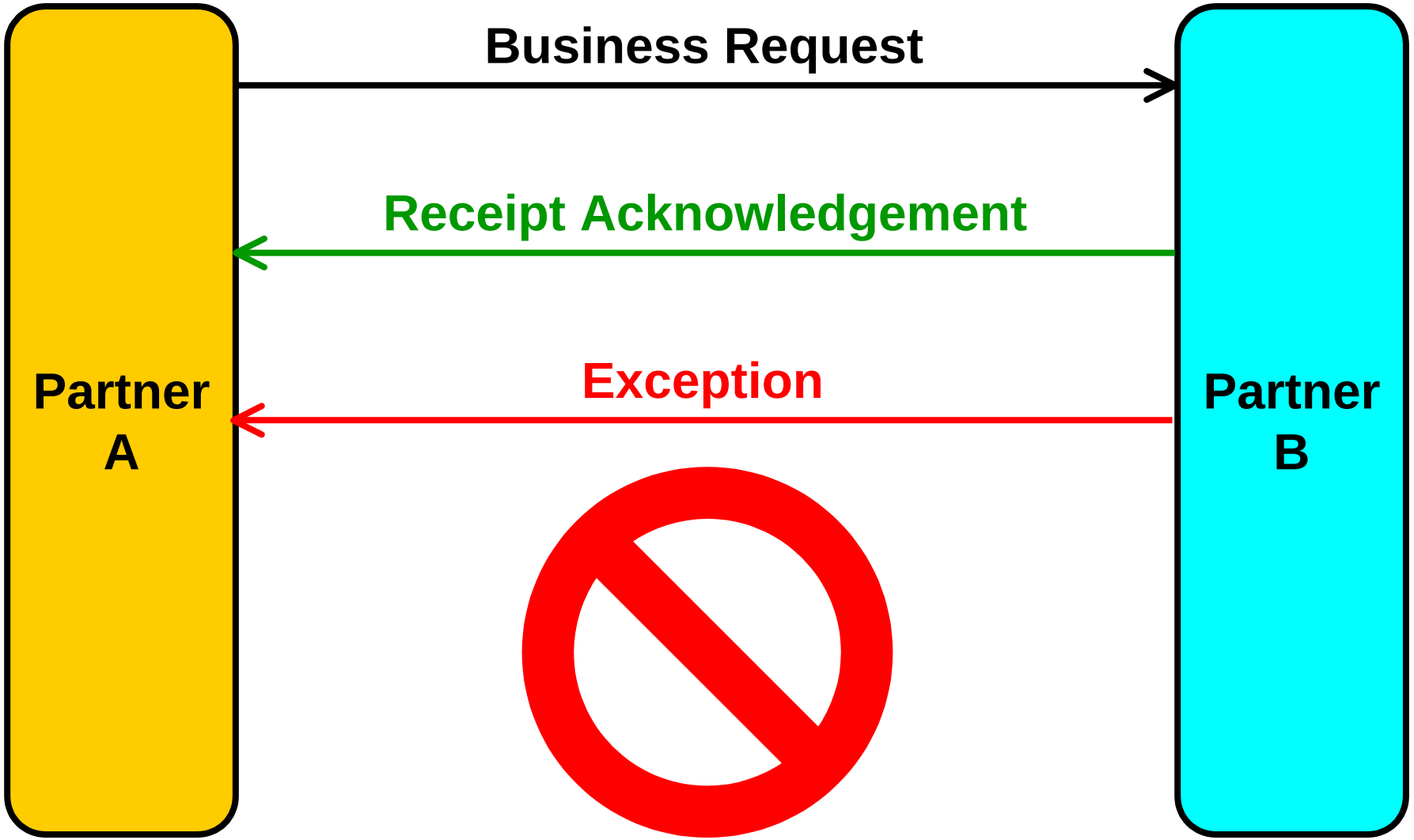
Collaboration as Document Exchange



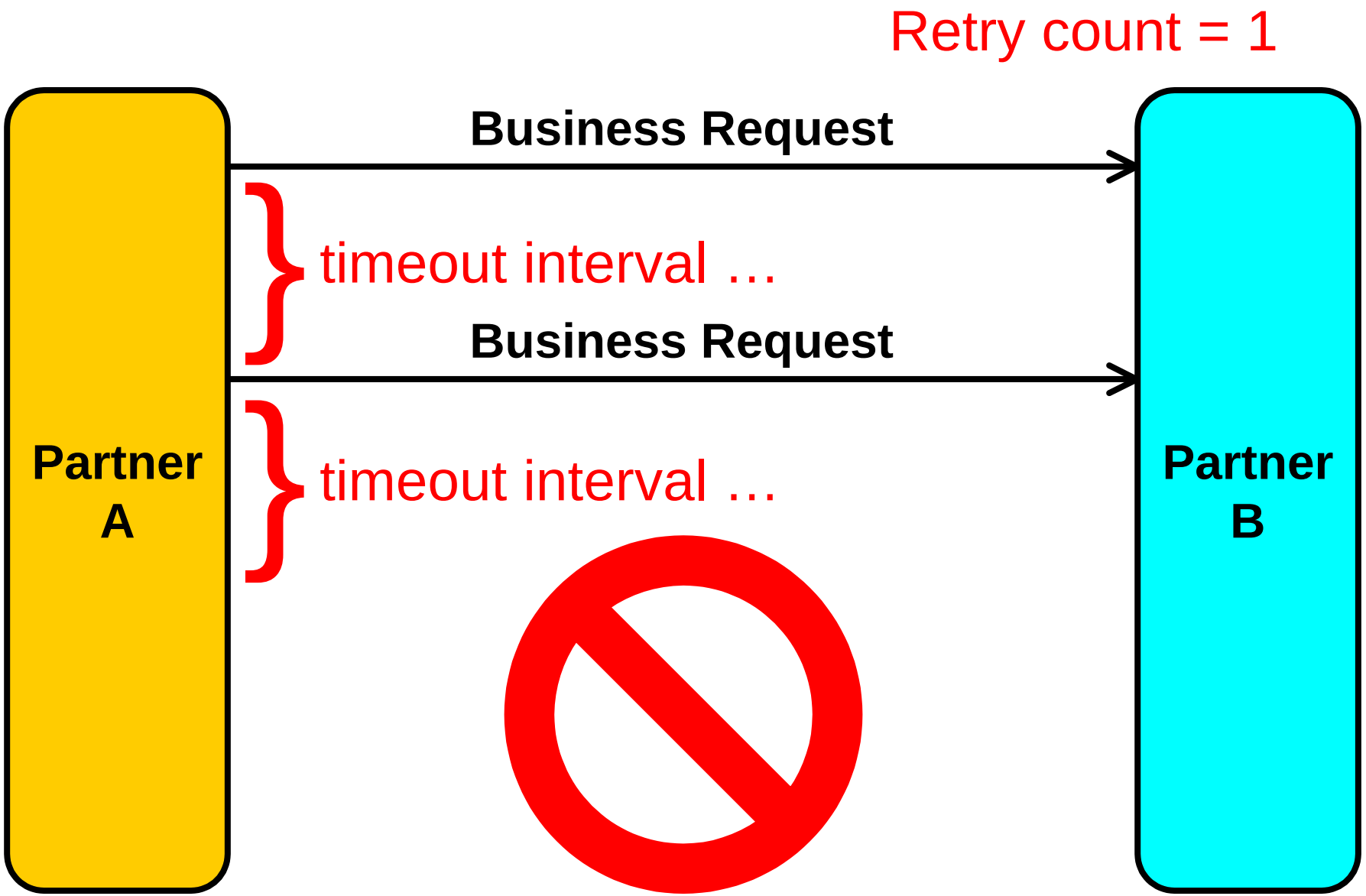
Acknowledgement Signals



Error Signals



Timeouts and Retries



UN/CEFACT Modeling Methodology (UMM)

- **International standard for elaborating specifications**
- **Basis for ebXML business process schema**
- **Compatible with RosettaNet metamodel**

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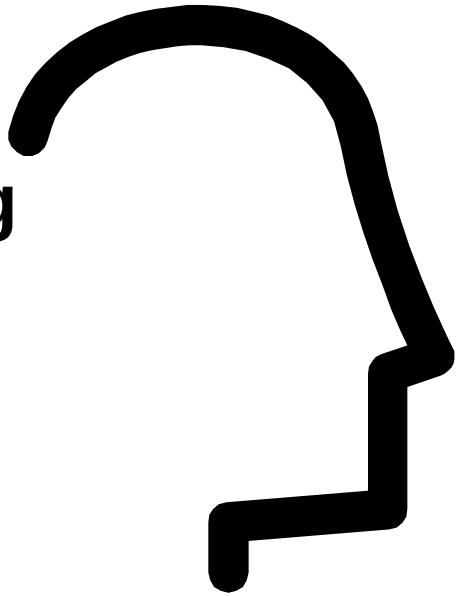
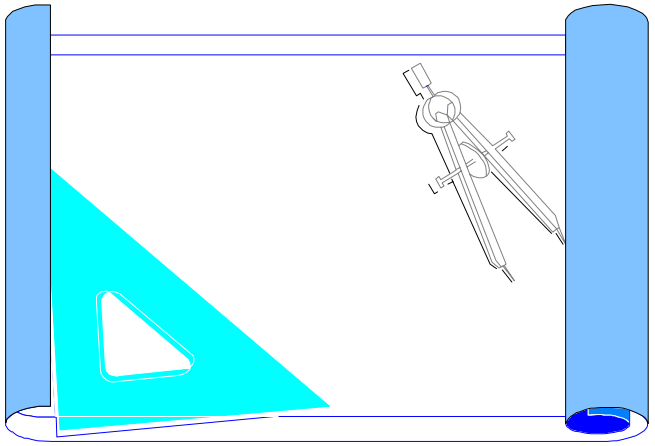


RosettaNet

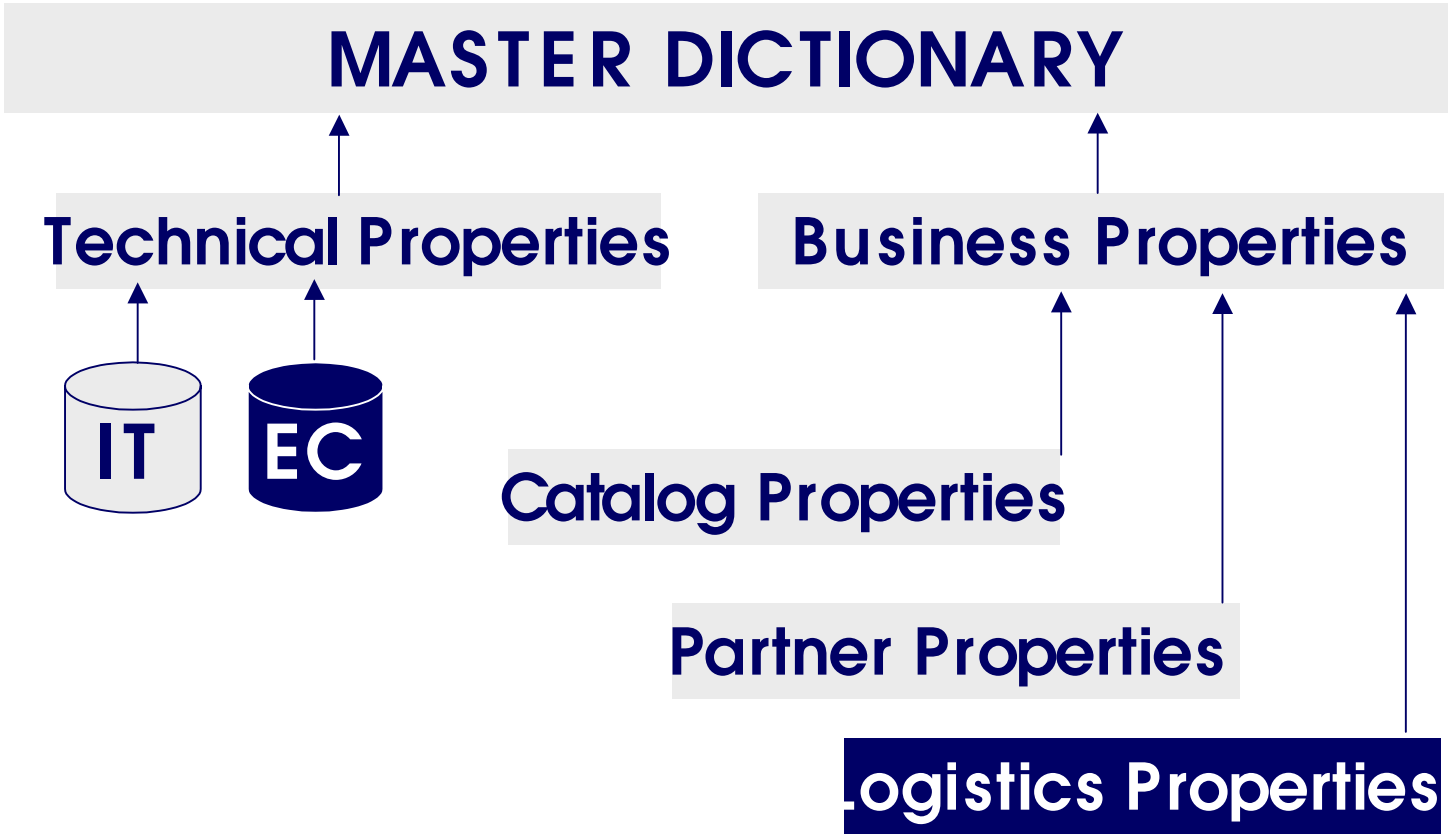
- **Vertical consortium**
- **Global scope / ambition**
- **Industry boards**
  - **Information technology (IT)**
  - **Electronic components (EC)**
  - **Semiconductor manufacturing (SM)**
- **Drives simultaneous agreement across the industry**

RosettaNet Architecture

1. **Dictionaries**
2. **Partner Interface Processes (PIPs)**
3. **Implementation framework (RNIF)**



RosettaNet Dictionaries



Source: RosettaNet

Product and Partner Codes

- **D-U-N-S**
  - **Identify unique business locations -- or trading partners -- around the globe**
- **GTIN**
  - **Globally unique identification numbers enabling inventory and order tracking throughout the supply chain**
- **UN/SPSC**
  - **Hierarchical code set used for product classification**

Source: RosettaNet

RosettaNet PIPs™

- **Partner Interface Processes**
- **Based on BTV / IFV layers**
- **System-to-system XML-based dialogs**
- **Define business collaborations between supply chain partners**
- **Composed of activities and transactions**

PIP™ Organization

- **Clusters**
- **Segments**

RosettaNet Clusters

1. RosettaNet Support
2. Partner Profile Management
3. Product Information
4. Order Management
5. Inventory Management
6. Marketing Information Management
7. Service and Support
8. Manufacturing

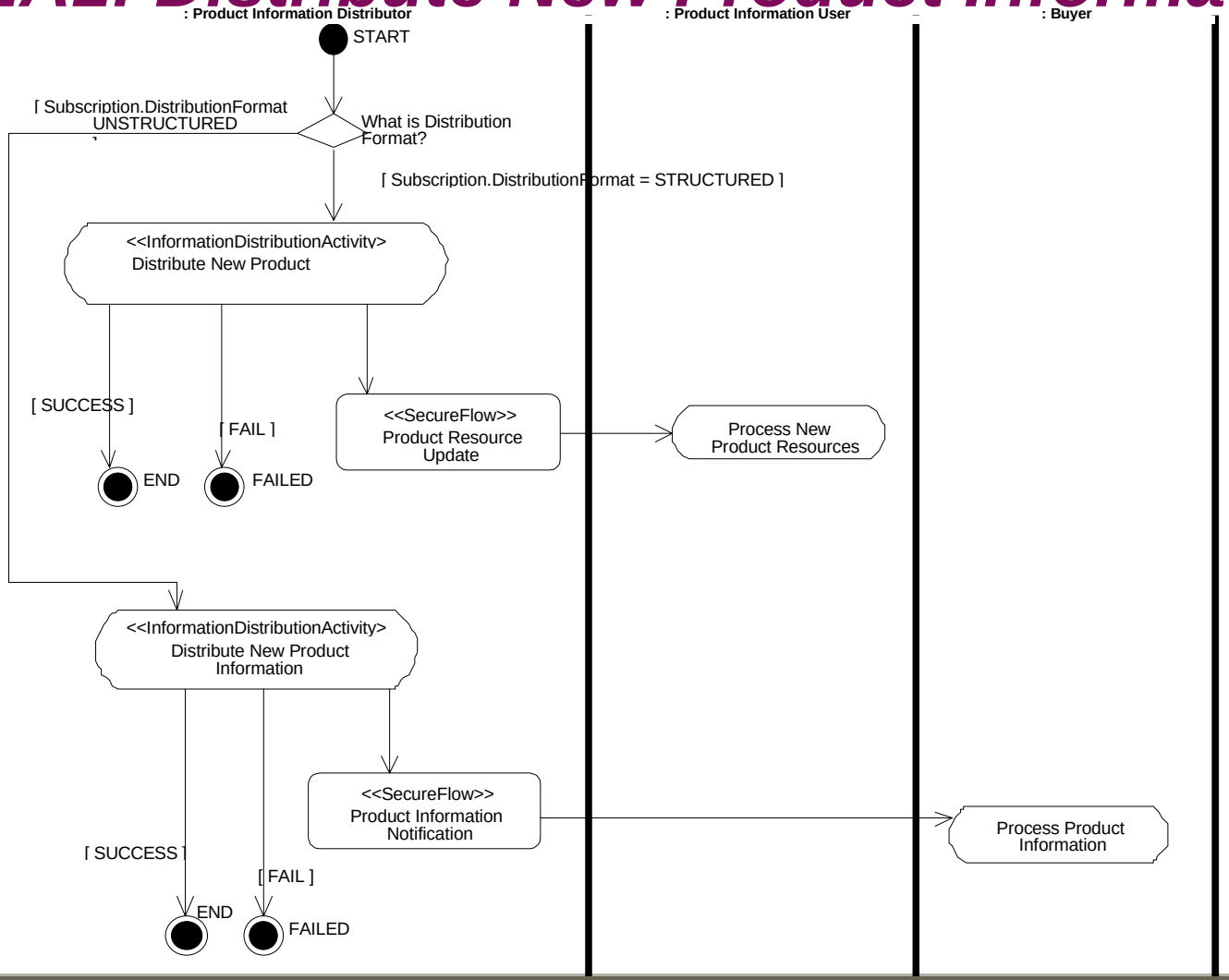
Cluster 2: Product Information

- **Segment 2A: Preparation for Distribution**
- **Segment 2B: Product Change Notification**
- **Segment 2C: Product Design Information**
- **Segment 2D: Collaborative Design**

Segment 2A: Preparation for Distribution

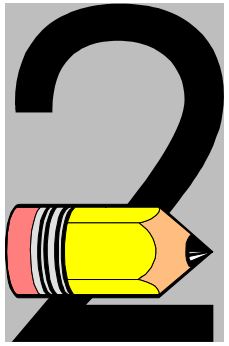
- **PIP 2A1: Distribute New Product Information**
- **PIP 2A2: Query Product Information**
- **PIP 2A3: Query Marketing Information**
- **PIP 2A4: Query Sales Promotion and Rebate Info.**
- **PIP 2A5: Query Technical Information**
- **PIP 2A6: Query Product Lifecycle Information**
- **PIP 2A7: Query Product Discontinuation Information**
- **PIP 2A8: Distribute Product Stock Keeping Unit (SKU)**
- **PIP 2A9: Query EC Technical Information**

PIP 2A1: Distribute New Product Information



RNIF 2.0

- **Released for validation January 2001**
- **Protocol independence**
- **Multiple transport protocols**
- **Hub support**
- **Attachments**
- **…**



Achievements of RosettaNet

- **More than 350 corporate participants**
- **All the top EC / IT players**
- **Represents over $ 1 Trillion in revenue**
- **Over 80% of IT and EC board members have implemented PIPs with partners**
- **Intel corporate bonuses based on RosettaNet in 2001**

Success Factors for RosettaNet

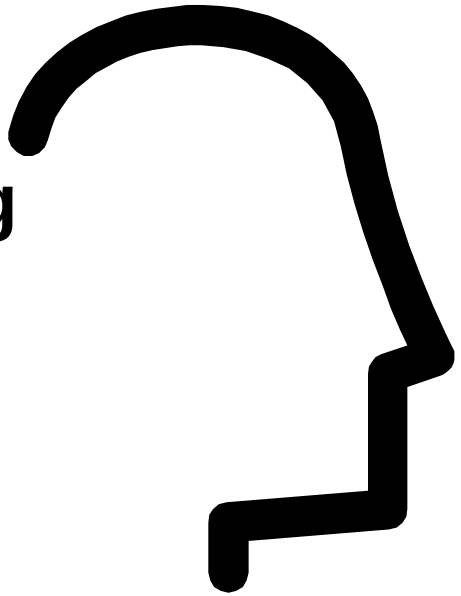
- **Focused leadership**
- **Marketing emphasis**
- **Executive buy in**
- **Up front commitments**
- **Partner champions**
- **Careful planning**
- **Phased rollout**

Limitations of RosettaNet

- **Not extensible for specific partnership**
- **No marketplace / exchange functionality**
- **No discovery for spontaneous e-Business**

Outline

1. Introduction
2. Business collaboration modeling methodology
3. RosettaNet
4. ebXML
5. Partner enablement
6. Conclusion



ebXML

- ***Electronic Business (via) XML***
- **Horizontal**
- **Global**
- **XML-based**
- **Rapid development**

Joint Venture

+

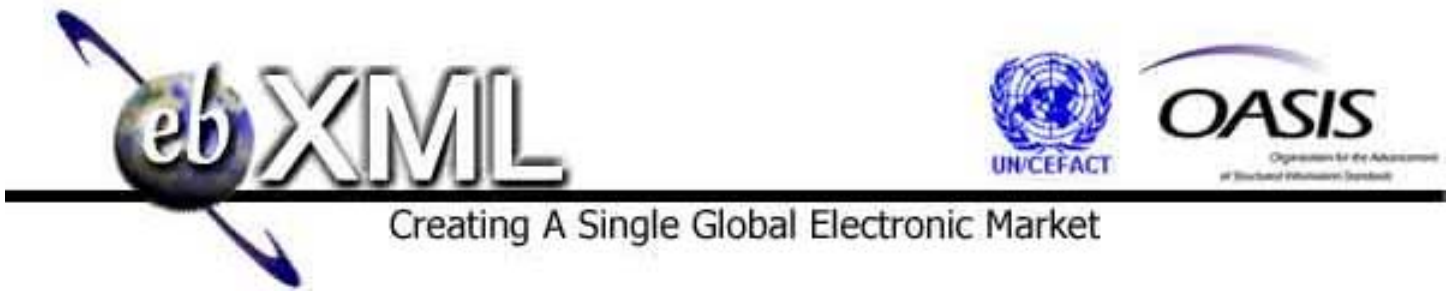
OASIS

UN/CEFACT

We Support ebXML

ebXML Mission

"Provide an open XML-based infrastructure enabling the global use of electronic business information in an interoperable, secure and consistent manner by all parties."



Source: ebXML

A Global Electronic Market

where enterprises of any size, anywhere can:

- **Find each other electronically**
- **Conduct business through the exchange of XML based messages**
  - ***using standard message structures***
  - ***according to standard business process sequences***
  - ***with clear business semantics***
  - ***according to standard or mutually agreed collaborative partner agreements***
- **Using off the shelf purchased business applications**

Text source: ebXML

Active Participation in ebXML

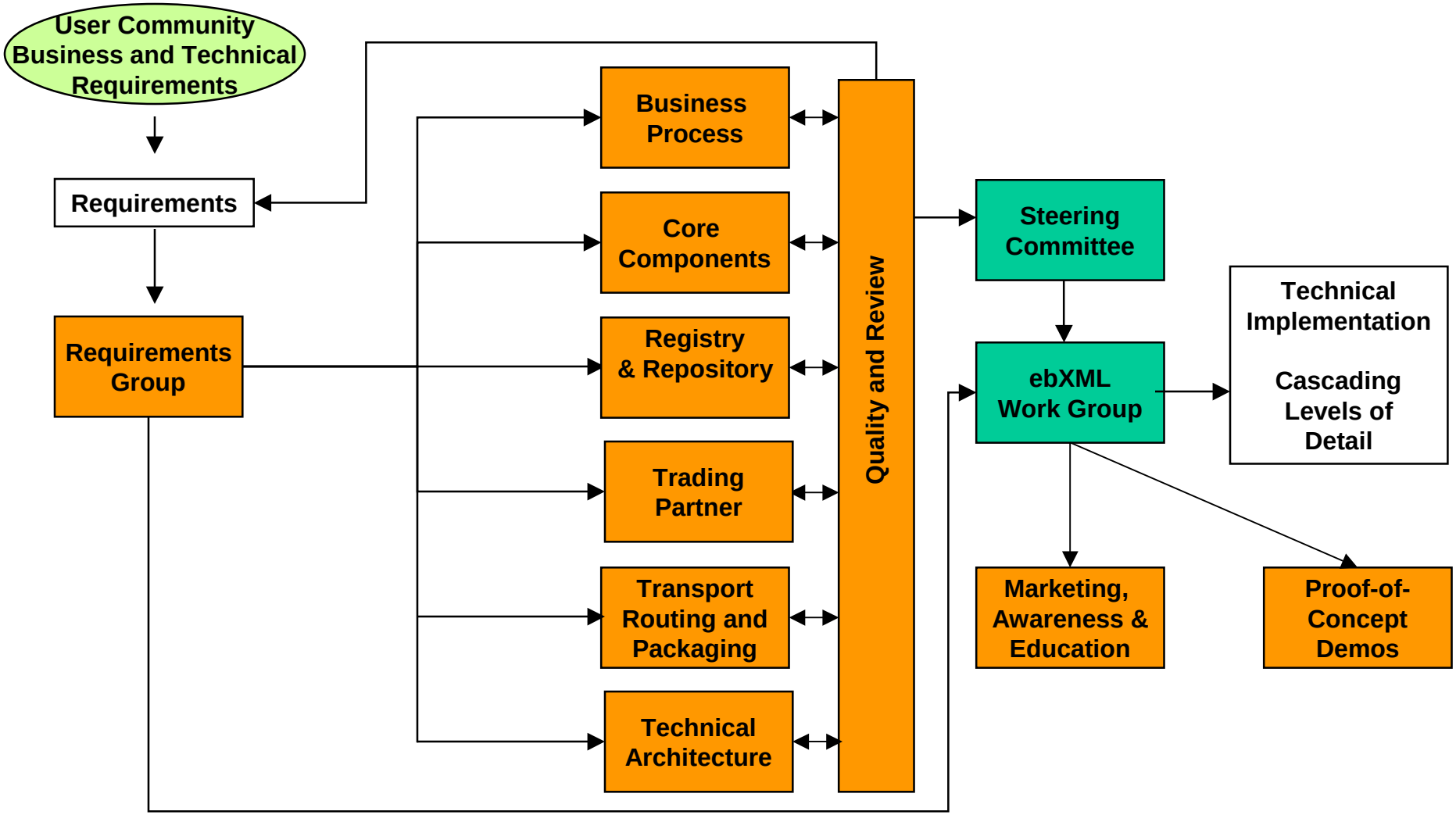
YES

- IBM
- Sun Microsystems
- Commerce One
- Edifecs
- …

NO

- Microsoft
- Ariba
- i2
- …

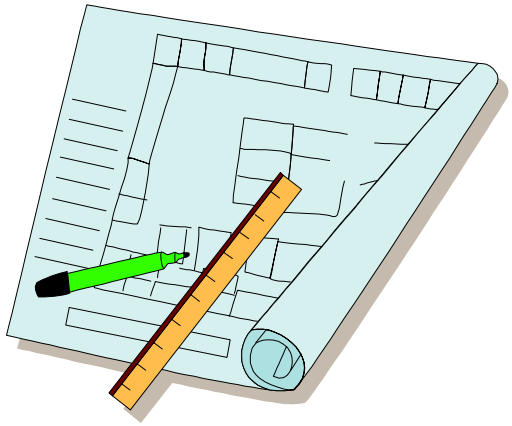
ebXML Project Teams

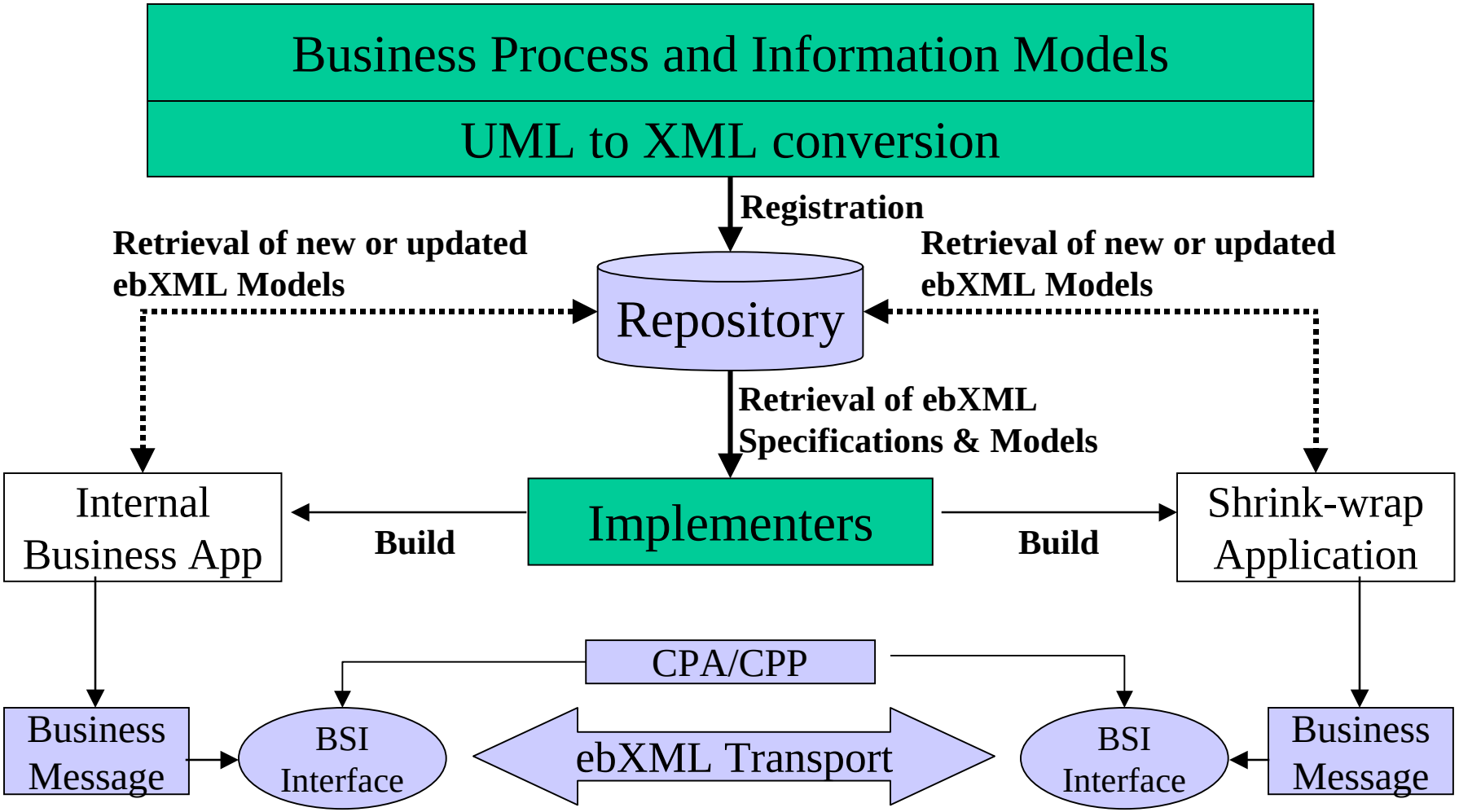


Source: ebXML

ebXML Technical Architecture

- **Created in parallel with other specs**
- **Basis for interaction and dependencies between groups**
- **Direct and/or consolidate work of other technical teams**

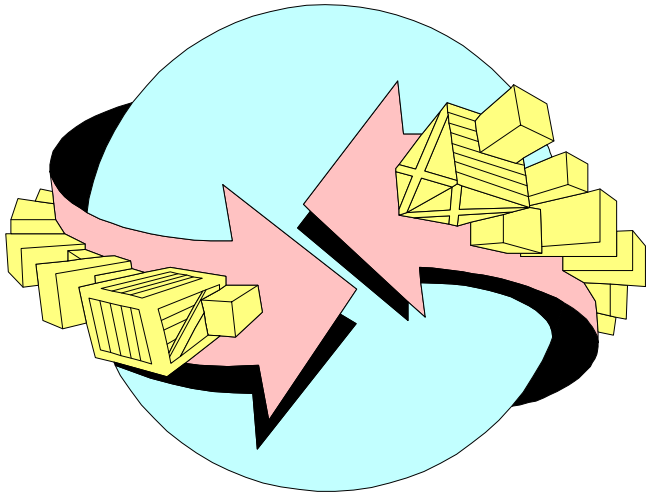




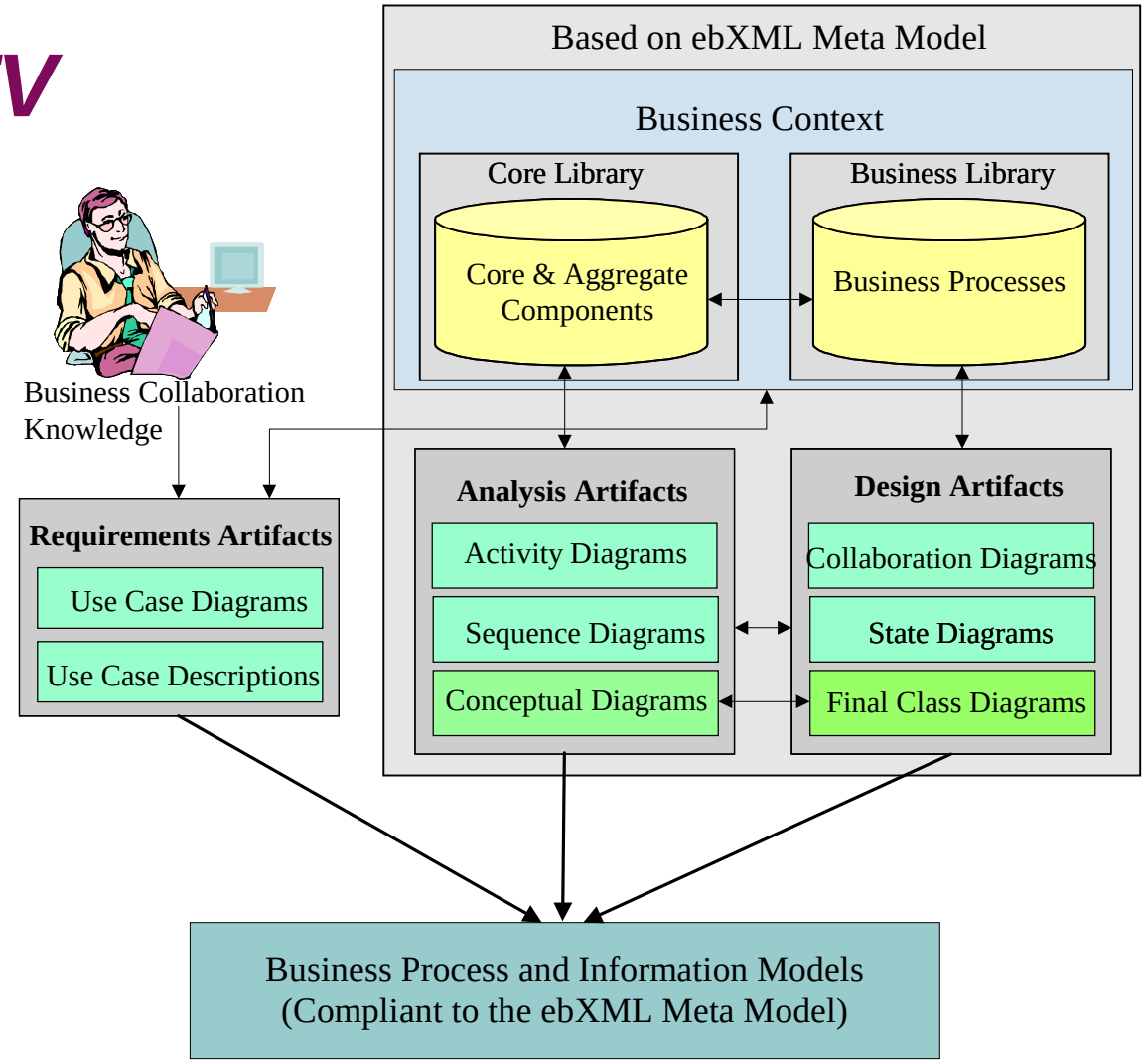
Source: ebXML

ebXML Business Processes

- **UML Metamodel and methodology**
- **XML “Specification Schema”**

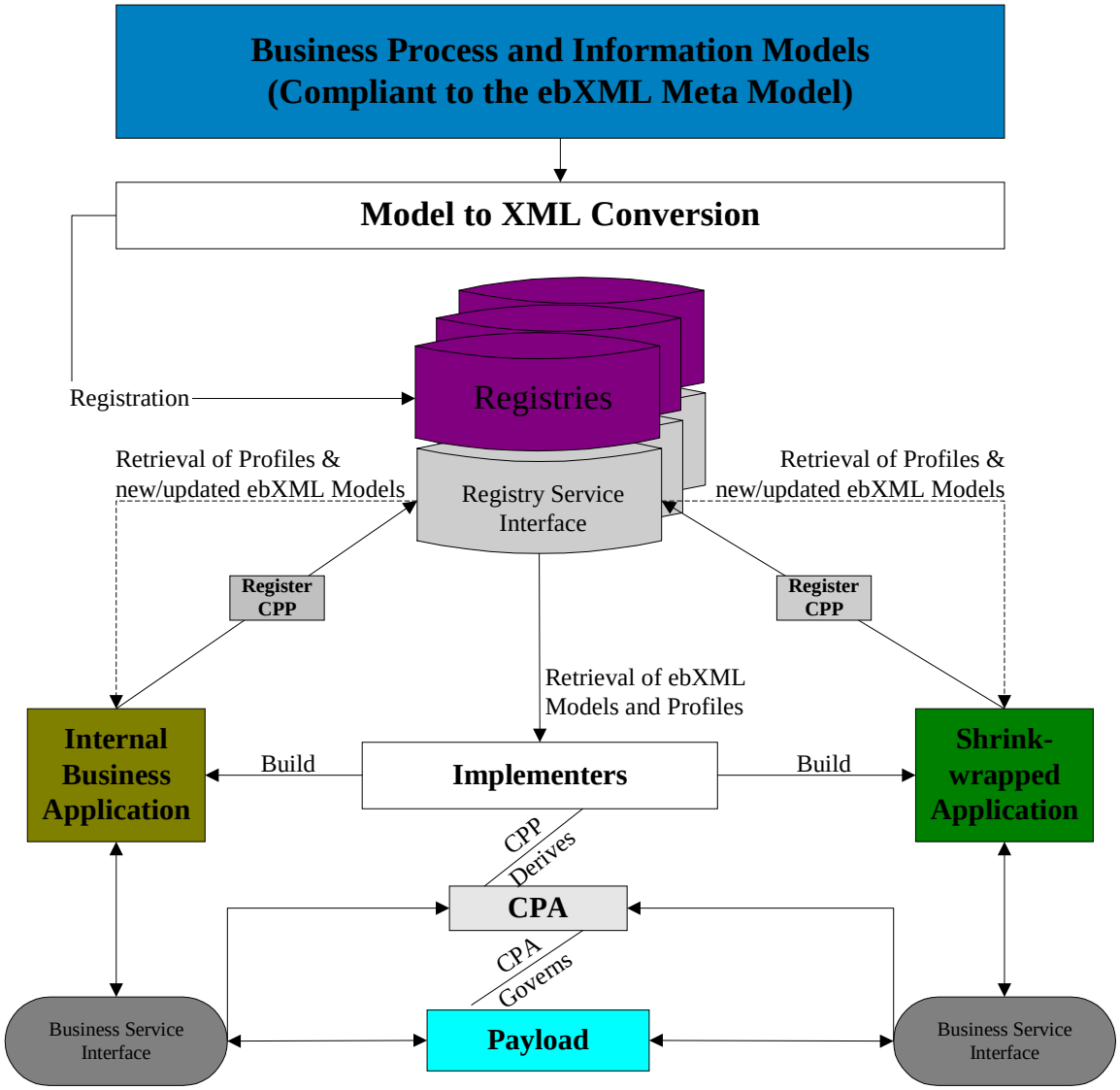


ebXML BTV



Source: ebXML

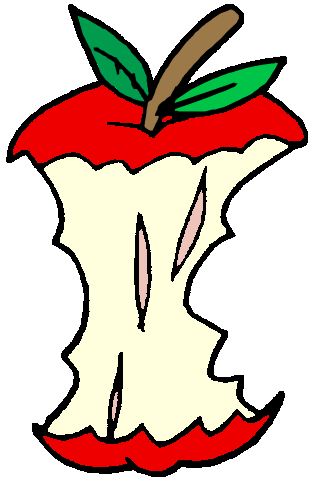
ebXML BSV



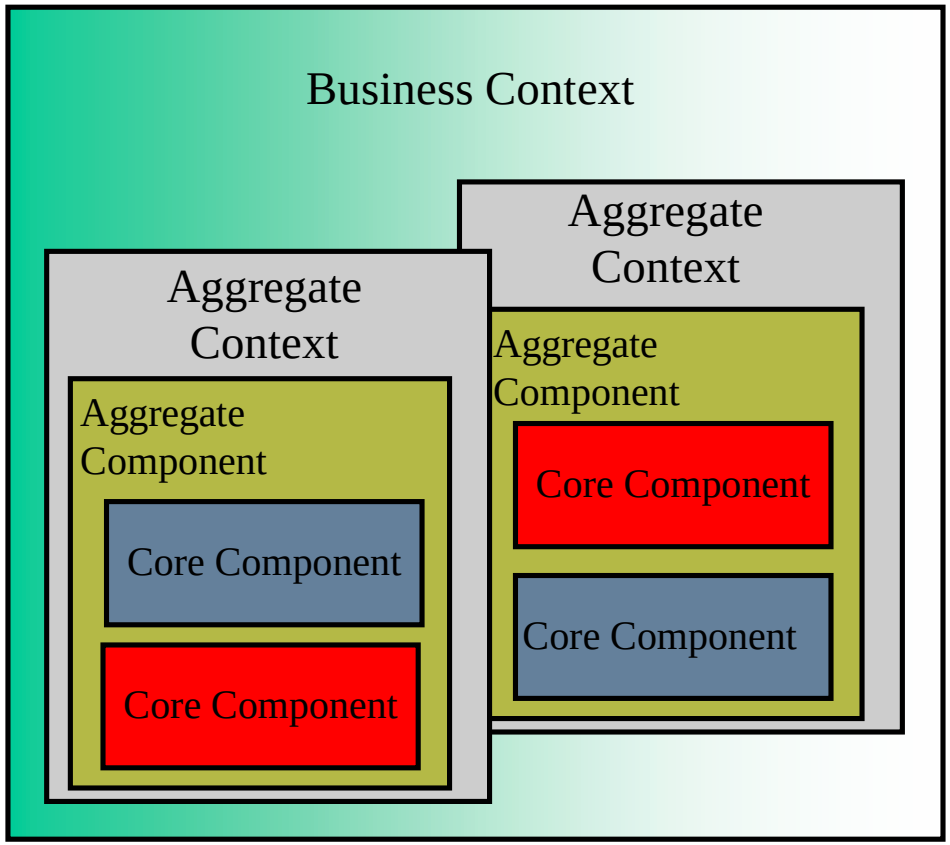
Source: ebXML

ebXML Core Components

- **Document constituents**
- **Fundamental processes**
- **May vary by context**



Core Component Contexts

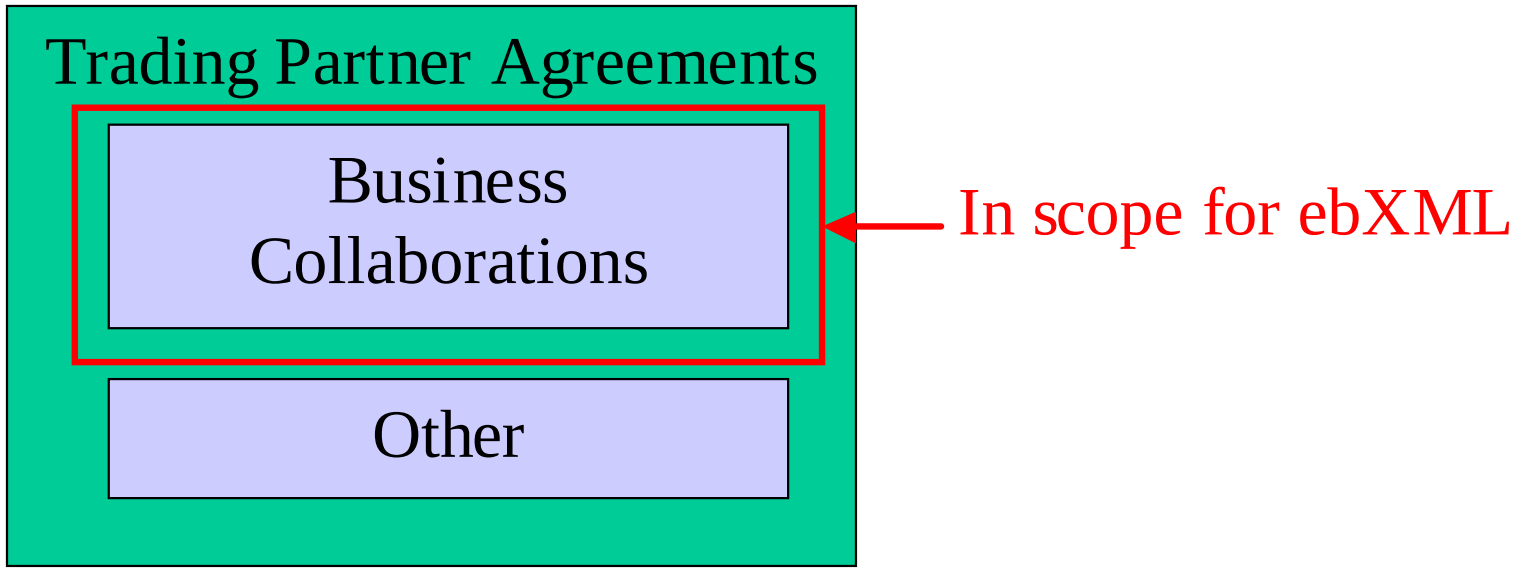


Source: ebXML

ebXML Trading Partners

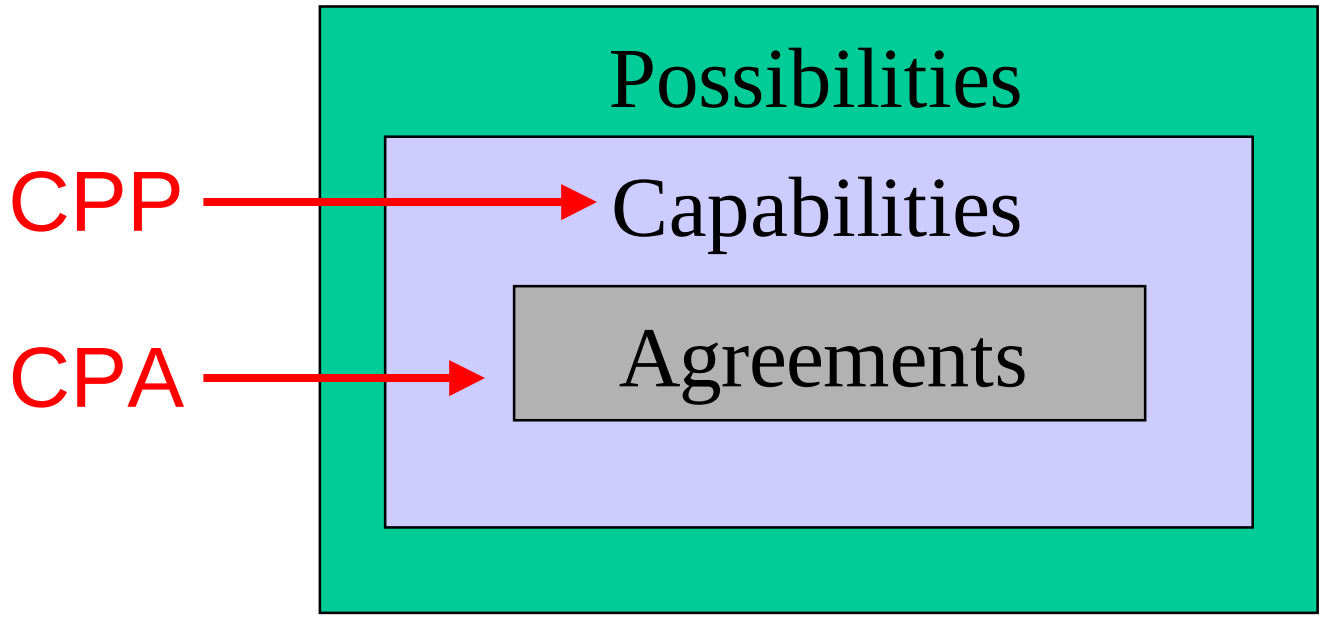
- **Collaboration Protocol Profile (CPP)**
  - **Advertise for discovery**
  - **Facilitate negotiation**
- **Collaboration Protocol Agreement (CPA)**
  - **Document technical agreement – what middleware can manage and enforce**
  - **Automate system configuration**
- **Realized as XML documents**

TPA vs. CPA



Source: ebXML

CPP / CPA Relationship

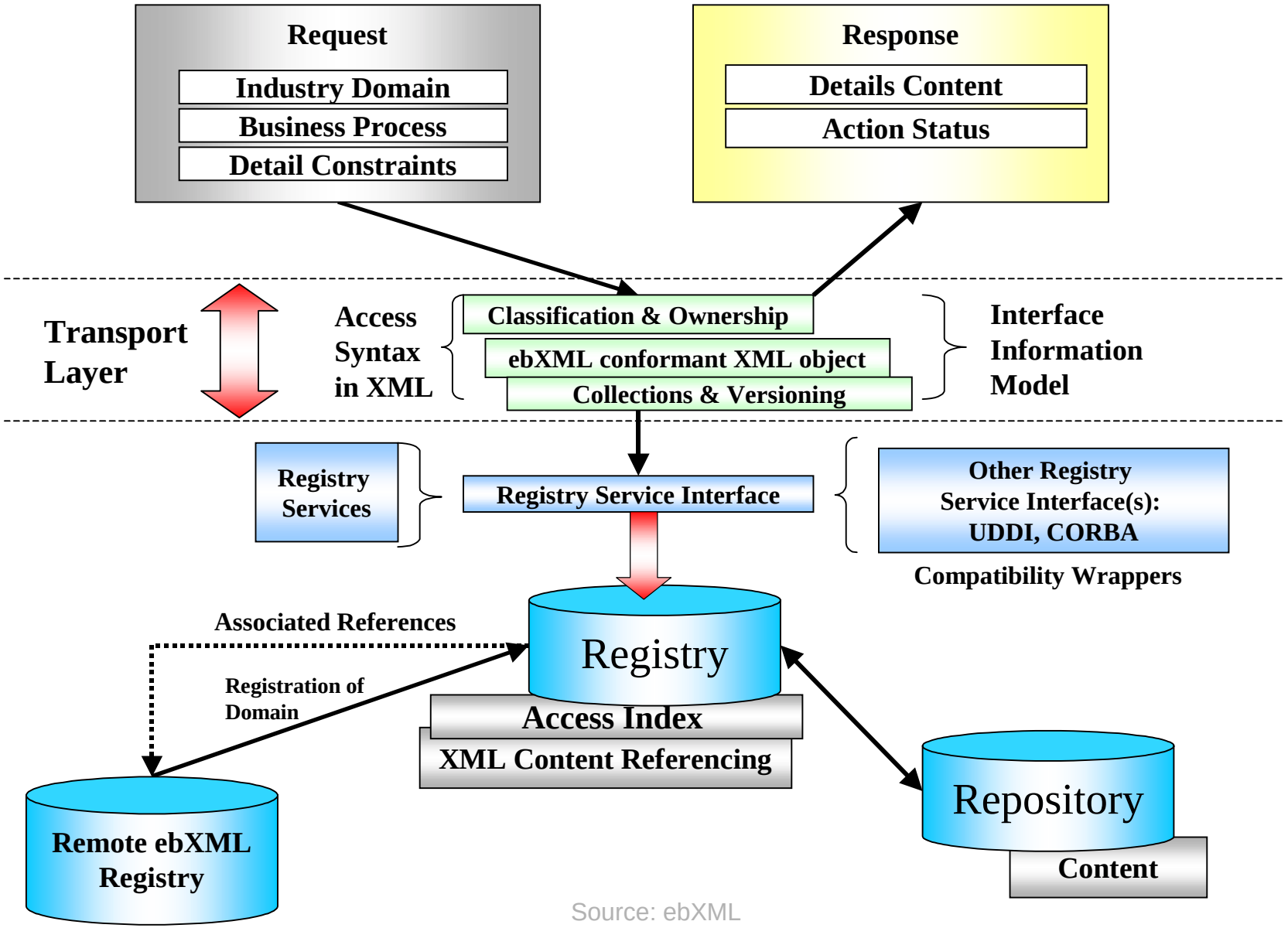


Source: ebXML

ebXML Registry and Repository

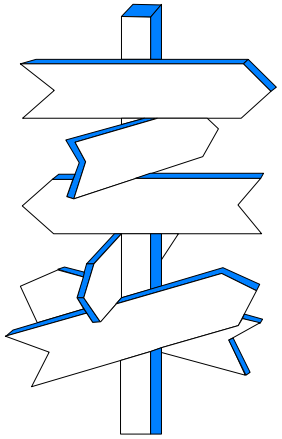
- **Registry**
  - **Artifacts *and* services**
  - **Build-time *and* run-time**
  - **Supports life cycle of managed objects**
- **Repository**
  - **Holds process and information models, core components, CPPs, …**

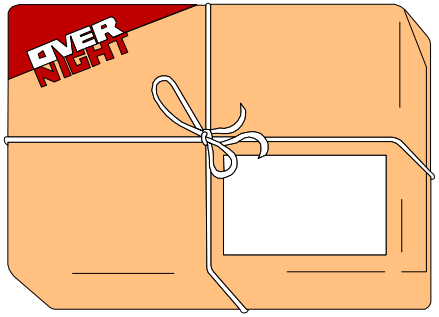
Registry / Repository Architecture



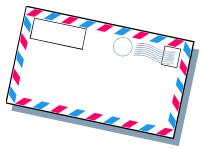
Source: ebXML

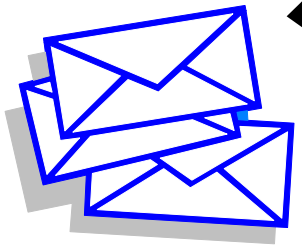
ebXML Transportation, Routing, and Packaging

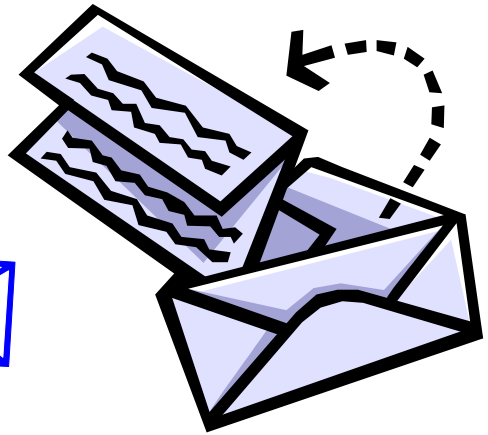


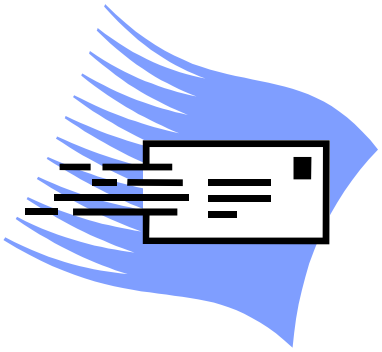


… AKA ebXML Messaging





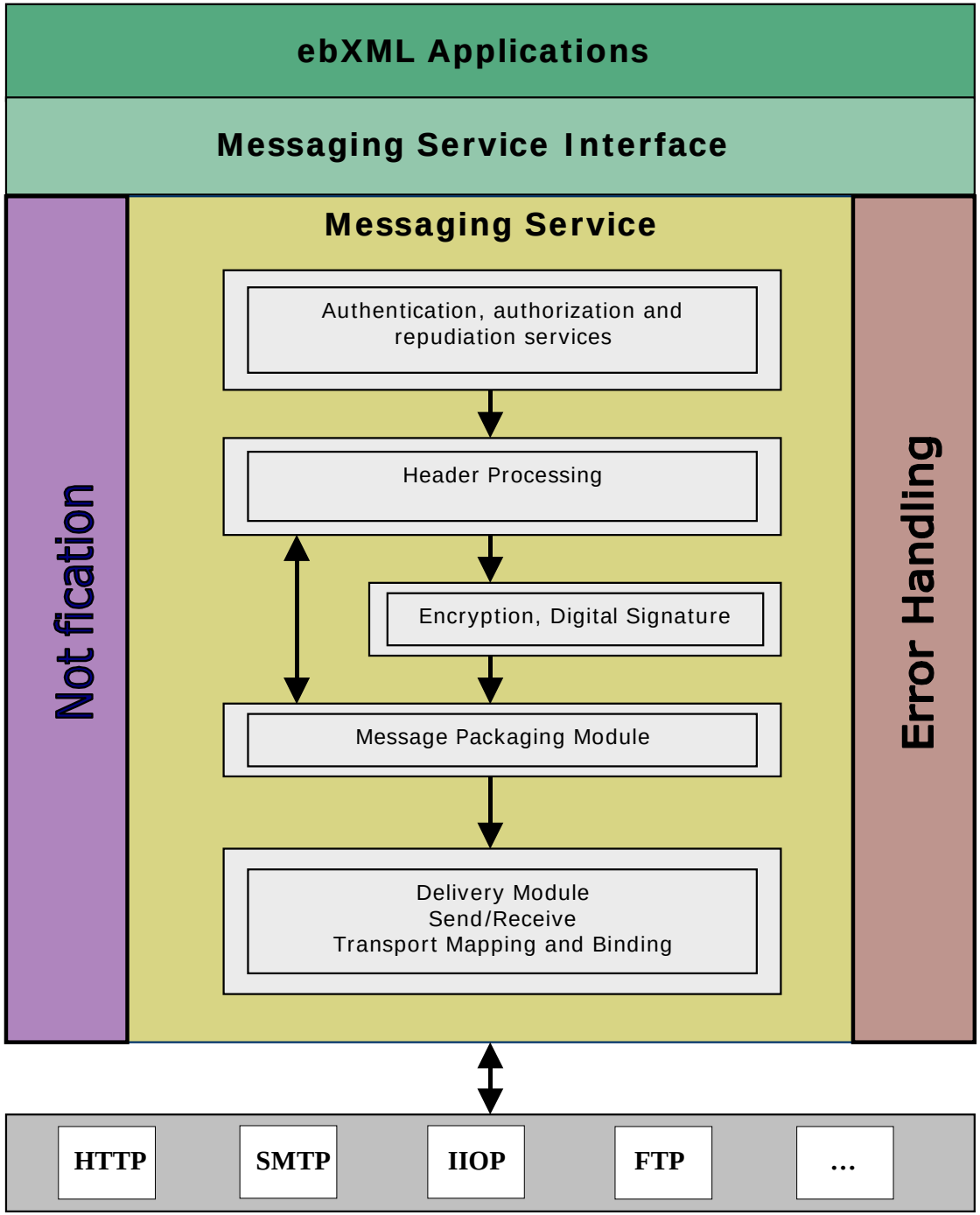




Messaging Aspects

- **Packaging**
- **Message headers**
- **Message service handler services**
- **Reliable messaging**
- **Error handling**
- **Security**

ebXML Messaging Service



Source: ebXML

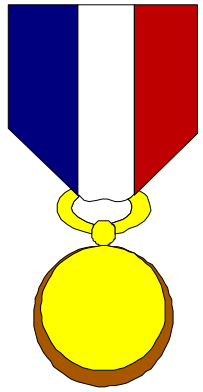
ebXML Message

- **Now being aligned with SOAP**

Source: ebXML

Achievements of ebXML

- **Comprehensive framework for e-Business**
- **Technical infrastructure**
- **Analysis methodologies**
- **Reflects substantial technical expertise**
- **Delivered on time**
- **Foundation and future roadmap**

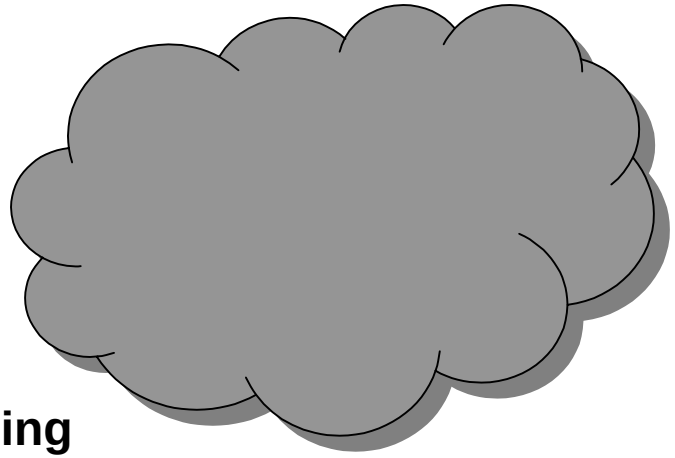


Limitations of ebXML

- **Specifications at most version 1.0**
- **Some functionality pending**
- **No specific business collaborations or message schema**
- **Customer demand unclear**
- **Vendor support uncertain**

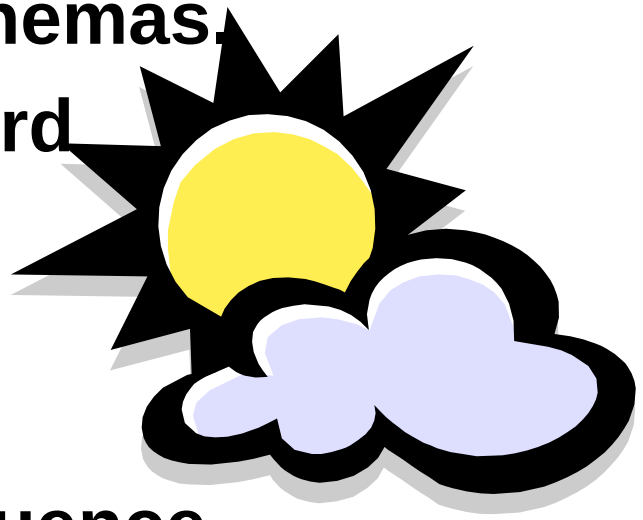
Future of ebXML

- **Not a “real” organization**
- **Specifications to be approved in May 2001**
- **Joint publication by OASIS and UN/CEFACT**
- **No charter renewal thereafter**
- **Projects to be apportioned**
  - **“Infrastructure” to OASIS?**
    - **Trading Partners**
    - **Registry / Repository**
    - **Transportation, Routing and Packaging**
  - **Business processes to UN/CEFACT?**



Future of ebXML, cont.

- **OAG working with ebXML BPM team; plans to define processes in ebXML format, develop BP Collaboration Schemas.**
- **Lightweight coordinating board**
  - **Manage IPR**
  - **Decide on standards direction**
- **OASIS to join CEFACT?**
- **Work should have lasting influence**



RosettaNet	ebXML
Vertical	Horizontal
Top-down direction	Bottom-up initiative
Single unified vision	Fragmented but flexible vision
Specifies entire solution	Accommodates other solutions
PIPs™, dictionaries, codes	–
–	Registry / Repository
–	CPP / CPA

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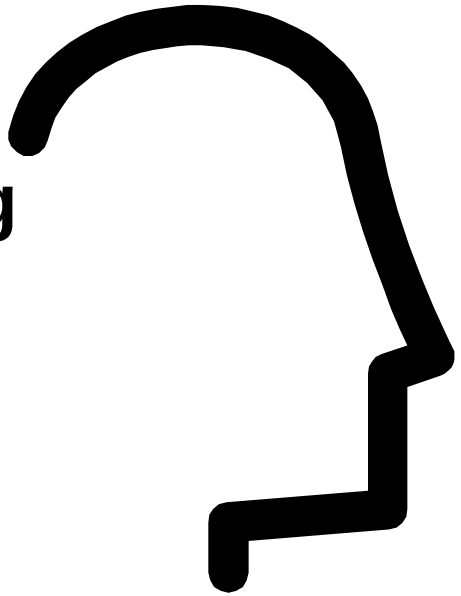


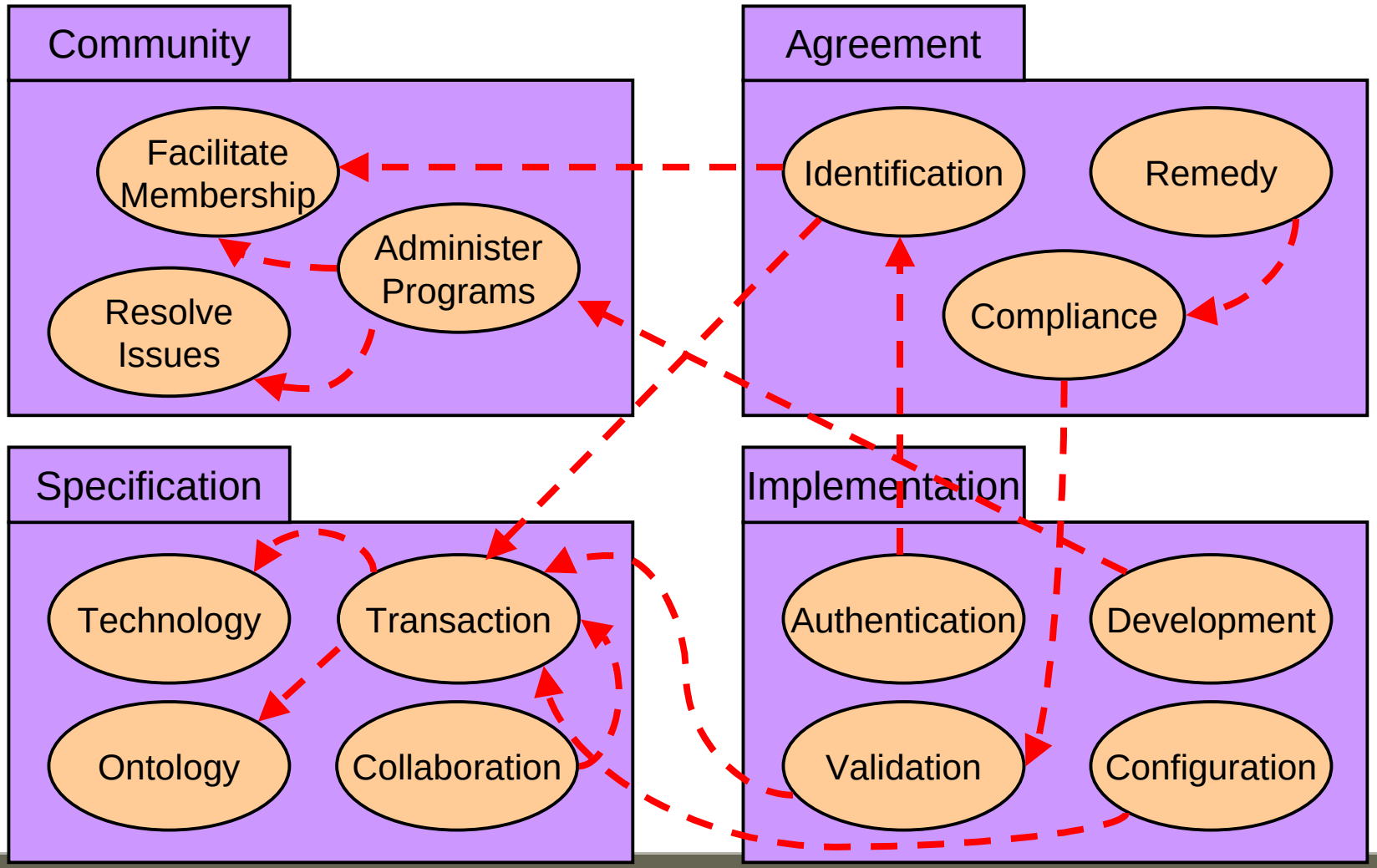
Partner Enablement

- **The hidden bottleneck of B2B**
- **Challenge to supply chains and markets**

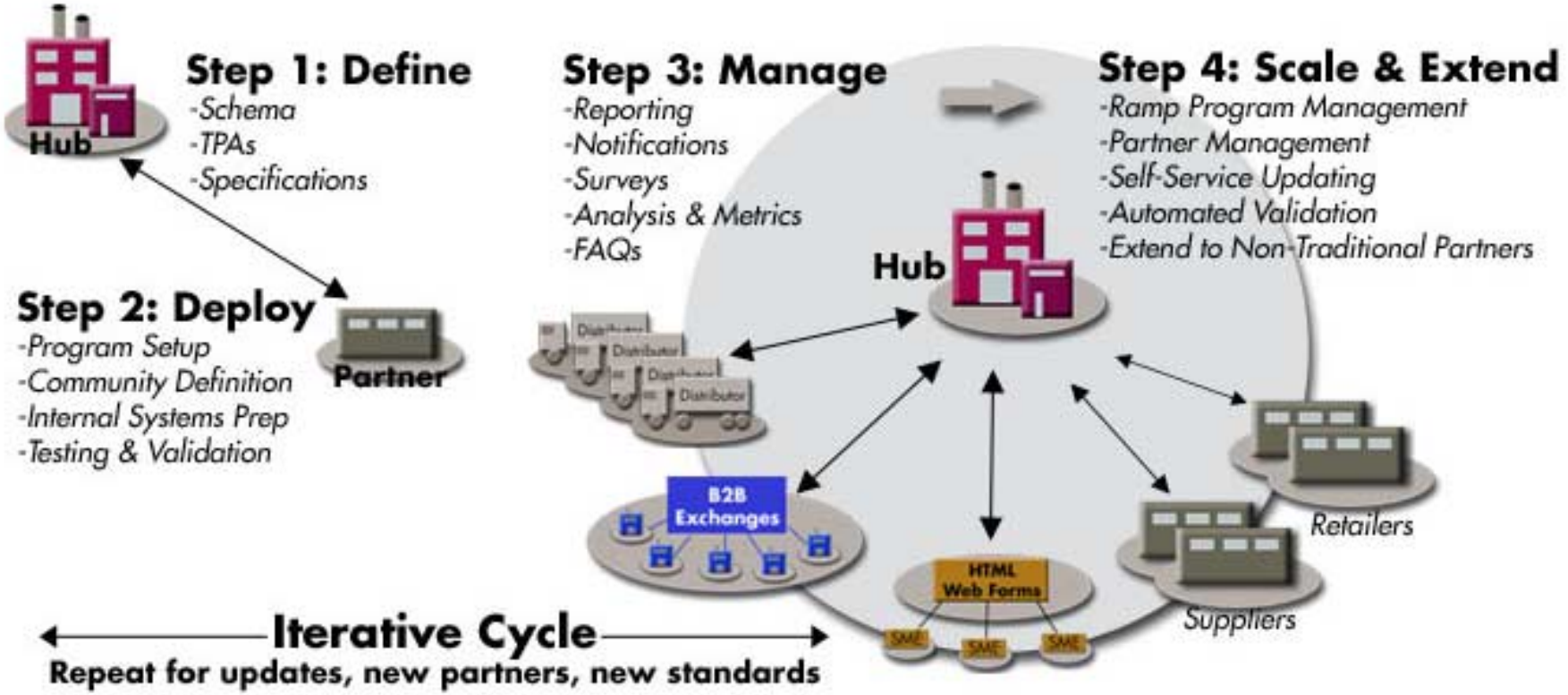
Partner Enablement Framework (PEF)

- **Trading Community Membership**
  - **Where you establish lines of communication**
- **Trading Program Specification**
  - **Where you define operational interfaces and their implementations**
- **Trading Program Implementation**
  - **Where you establish technical connectivity and operational responsibility**
- **Trading Partnership Agreement and Contract**
  - **Where you define and commit to partnership success**

PEF Dependencies



The Steps of the Enablement Process



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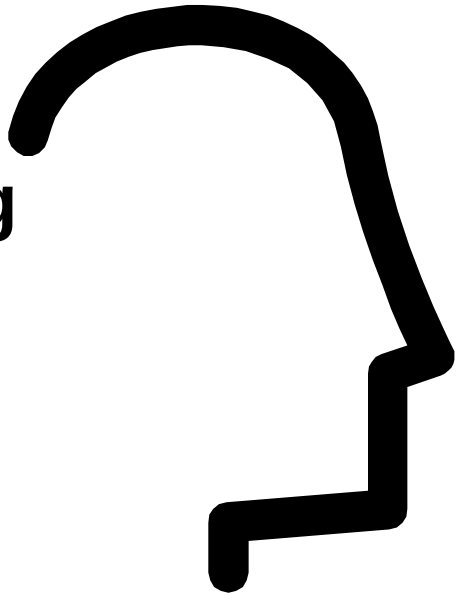
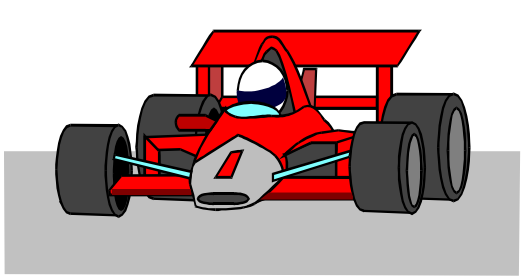


Conclusion

- **Almost done …**

Assessment

- Where?
- When?
- **How?**

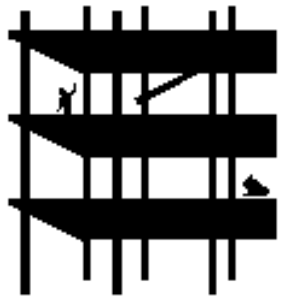


Websites

- **www.rosettanet.org**
- **www.ebxml.org**
- **www.supply-chain.org**
- **www.oasis-open.org**
- **www.uncefact.org**
- **www.edifecs.com**

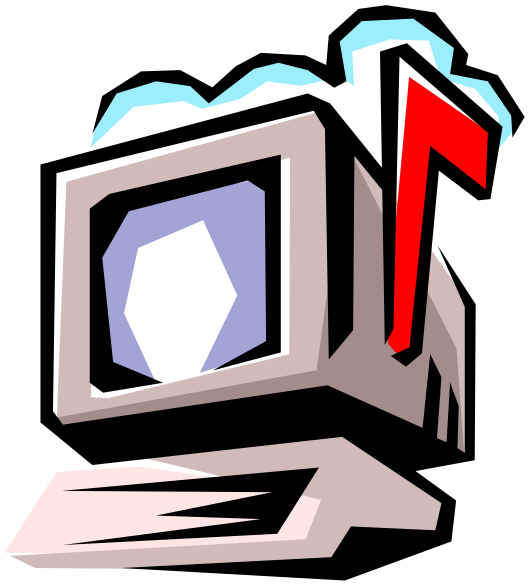
Business Collaboration Framework (BCF)

- **An ongoing Edifecs initiative**
- **Public documents**
  - **e-Business Collaboration Modeling Metamodel**
  - **e-Business Collaboration Design Patterns**
  - **e-Business UML Style Guide**
  - **e-Business XML Style Guide**
- **Has been donated to, incorporated into, and will remain aligned with UN/CEFACT Modeling Methodology administered by UN/CEFACT**

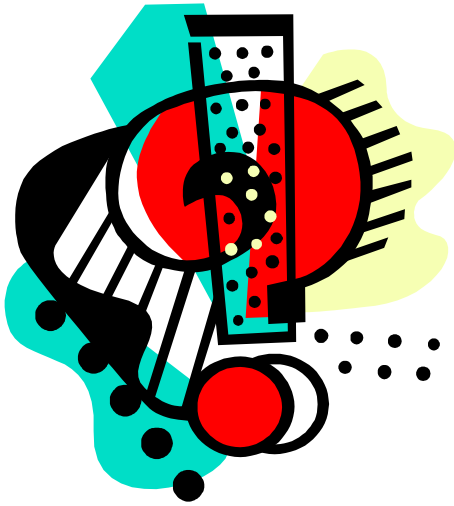


Contact

- **johny@edifecs.com**



Dialogue




THANK
YOU!


STOP

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