

MDA for Enterprise Collaboration & Integration



Enterprise
Collaboration
Architecture

EDOC

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What is the Enterprise Collaboration Architecture?



- ECA is a “profile of UML”, a way to use UML for a specific purpose - it is an OMG standard
 - That purpose is *Internal and B2B collaboration and integration*.
- You can also think of this as a “modeling framework” for enterprise computing
- ECA is part of the “Model Driven Architecture” (MDA) initiative of the OMG
 - Using precise modeling techniques as part of the development lifecycle to speed development and provide technology independence
- ECA has been adopted by the OMG as part of the EDOC RFP – <http://cgi.omg.org/cgi.bin/doc?ptc/02-02-05>

Problem Space



- Integration Nightmare
- Infrastructure, Version & Vendor lock-in
- Complex, divergent and manual development and deployment processes

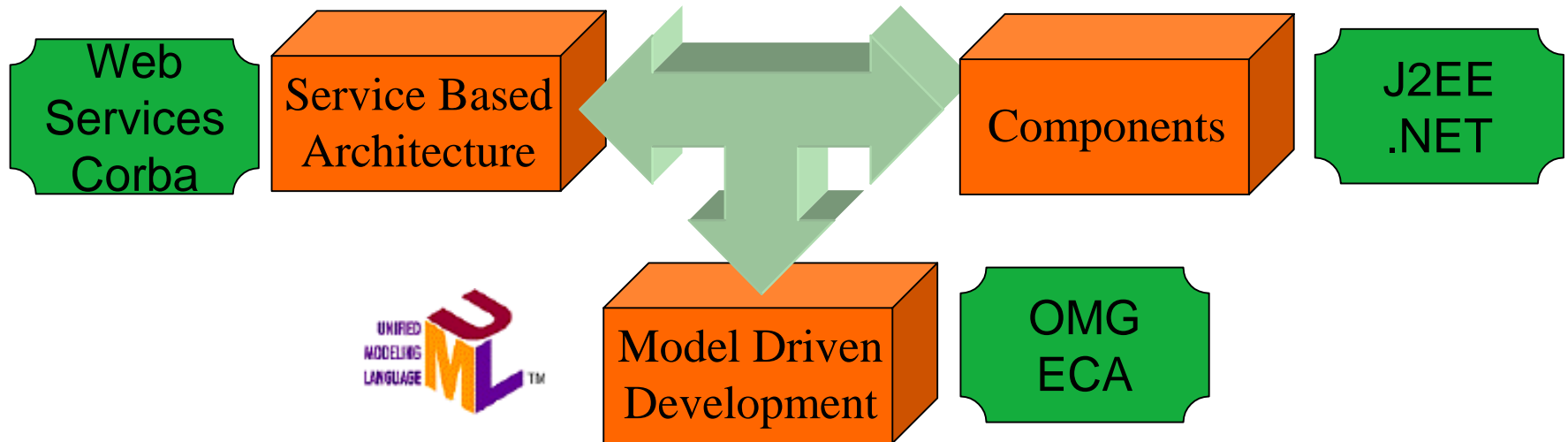
- *Typical solutions require buy-in (Lock-in) to expensive, pervasive and proprietary infrastructure*

Goals



- A scalable and robust enterprise and cross-enterprise architecture
- Loosely coupled enterprise components
- Enable rapid provisioning of business solutions
 - Simple, reproducible processes supporting reuse
- Technology & vendor independence
- Enable the integration and collaboration of multiple;
 - Business units (internal and external)
 - Customers
 - Suppliers
 - Systems
 - Technologies

Solution Triad



Technology Stew



- Web services
- .NET
- C'
- XML
- EAI
- Active Web pages
- EJB
- Java Beans
- Java
- Corba
- MQ-Series
- C++
- SQL
- Cobol
- IMS
- CICS
- ...

Technology is transient, but we must embrace and adapt to it to provide meet current requirements

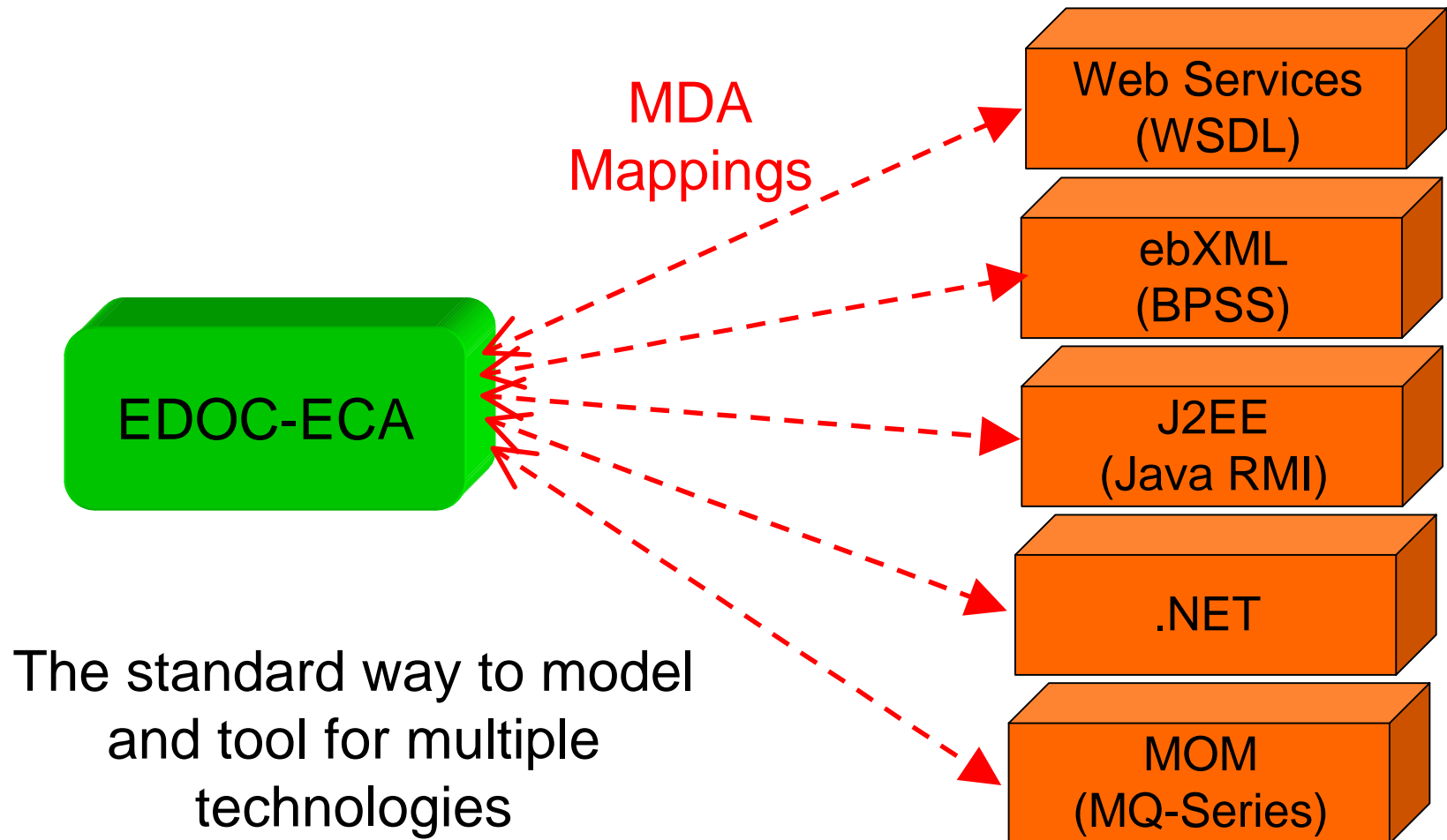
The new center



- The strategic core of you systems must be the business its self
- Only technology independent business focused models will survive the transience of technology and lock-in
- These models can become *part of your source code*, driving enterprise applications
- Enabler: Model Driven Architecture (MDA) with EDOC-ECA

Extreme Modeling

ECA as the normal form

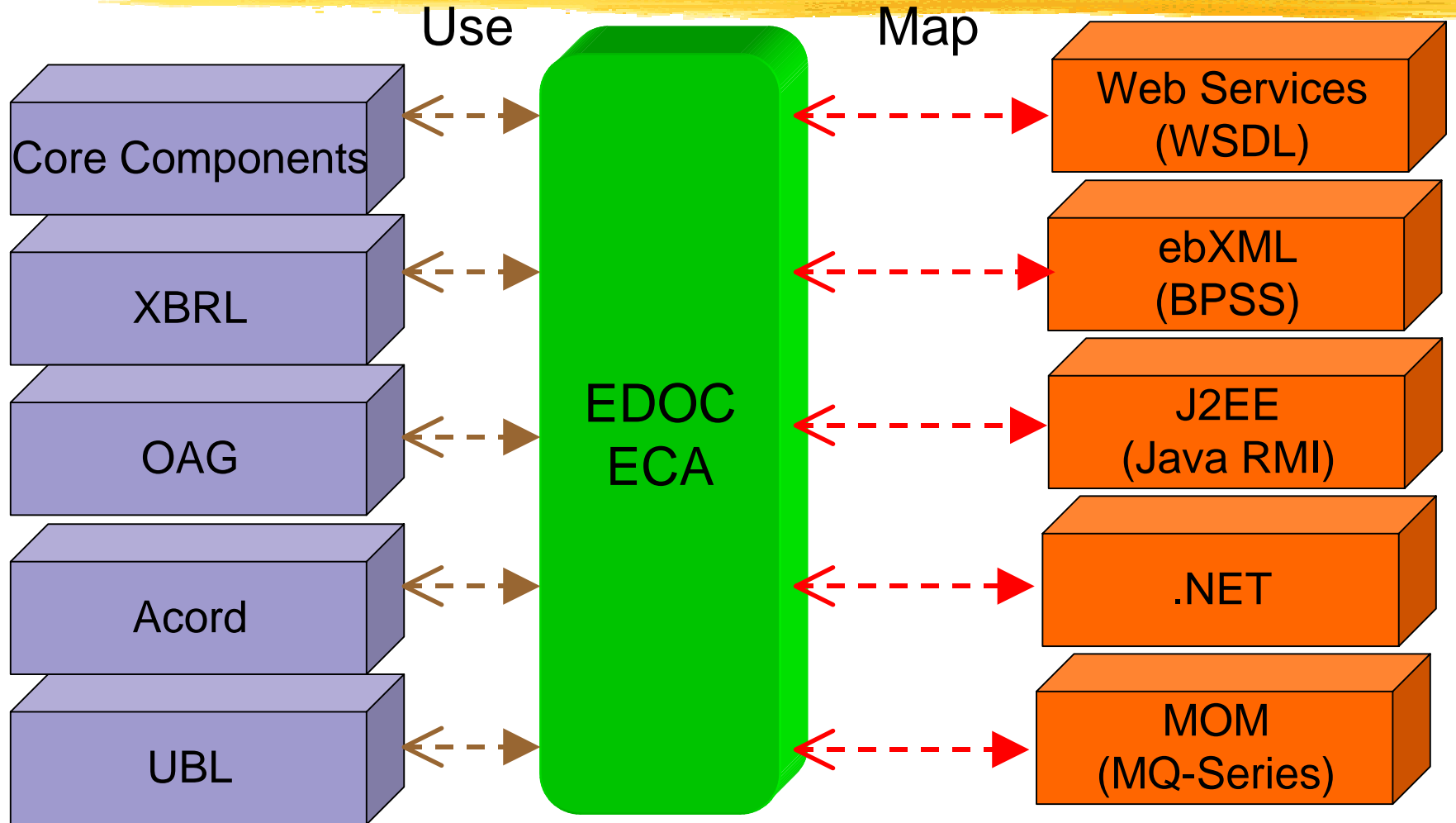


Specification Interoperability

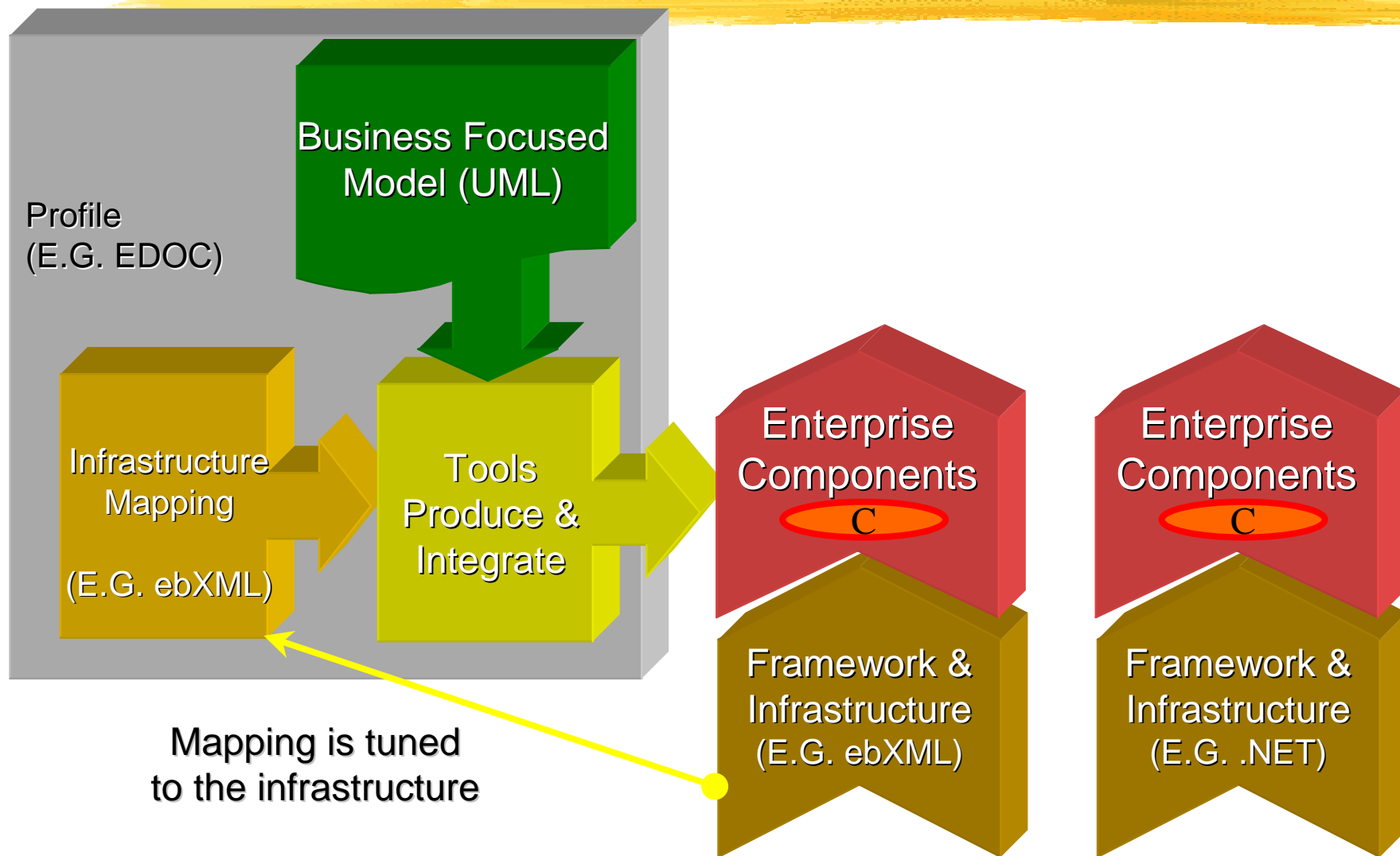


- ECA can represent and map to the semantics for multiple technologies
- Integrating the technologies and standards
- Mappings can include
 - Corba
 - .NET
 - J2EE
 - WSDL
 - WSFL
 - WSI
 - ...
- Use EDOC-ECA to specify domain standards

Domain Standards Using ECA

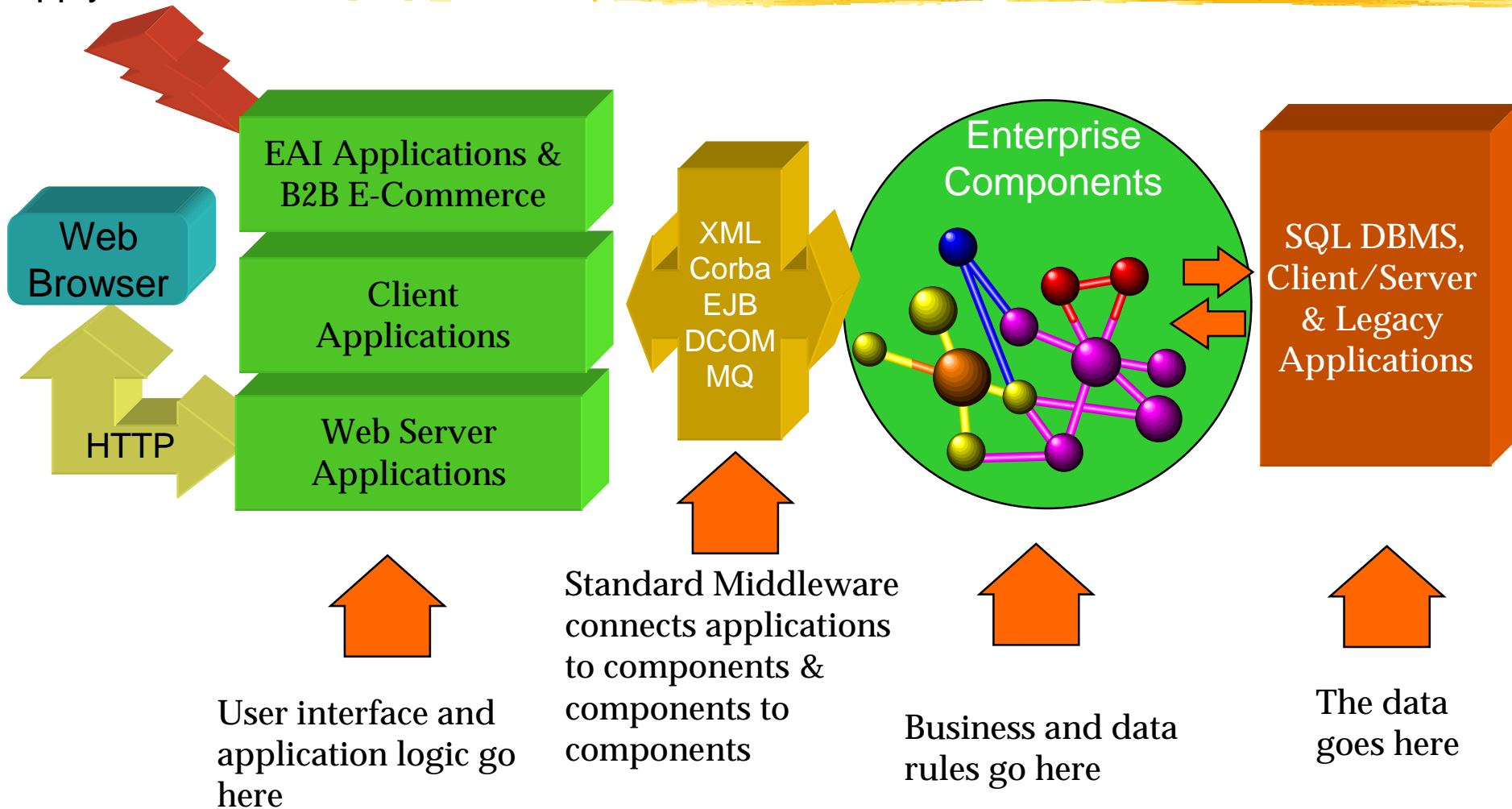


Automated Model Driven Architecture



Enterprise Architecture

Supply Chain



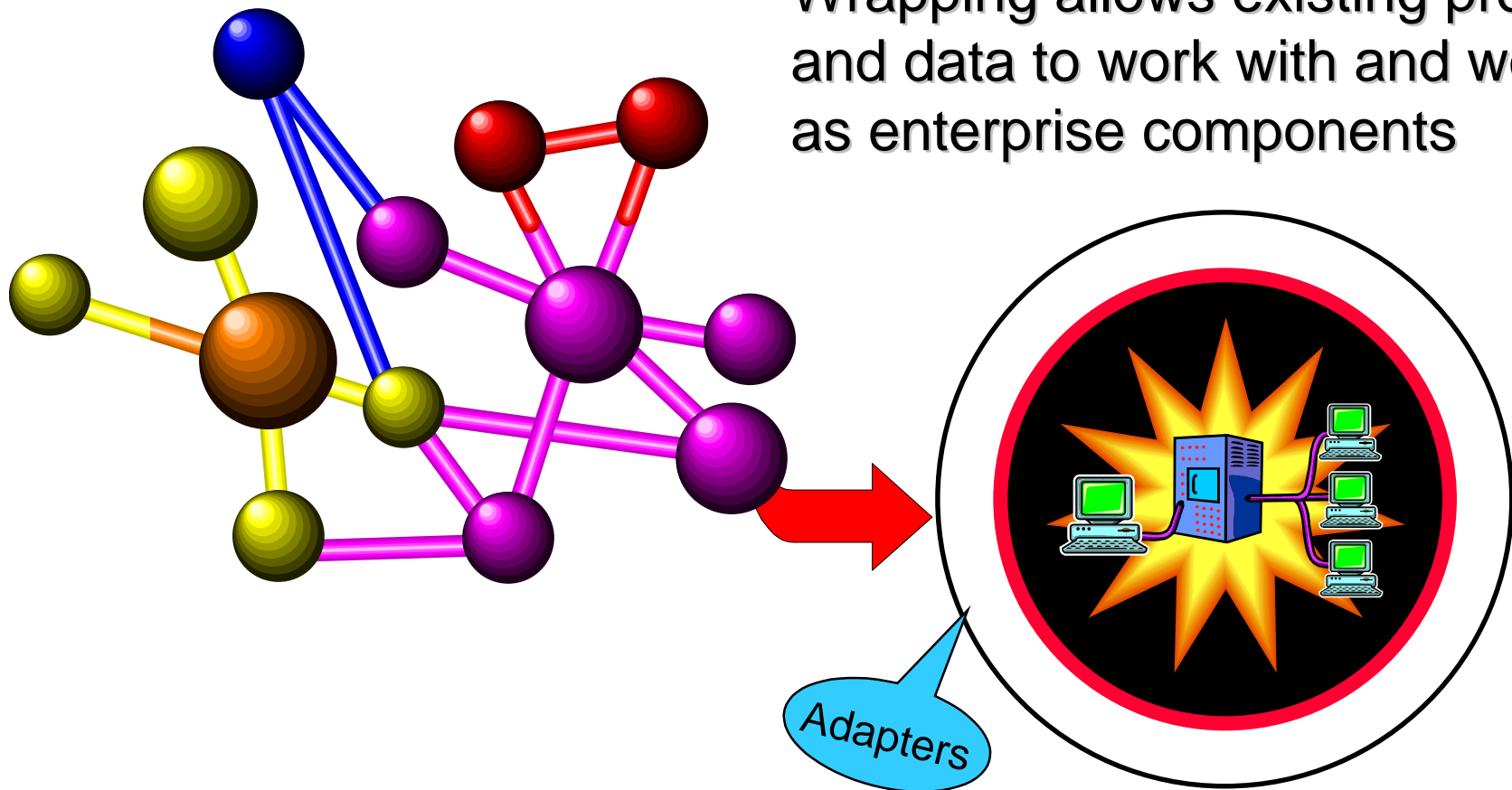
User interface and application logic go here

Standard Middleware connects applications to components & components to components

Business and data rules go here

The data goes here

Legacy "Wrapping"



Wrapping allows existing programs and data to work with and work as enterprise components

Collaborations and Roles



Conceptual Foundation

Portions copied with permission of Trygve
Reenskaug - Taskon

OORAM

(<http://www.ifi.uio.no/~trygver>)

History



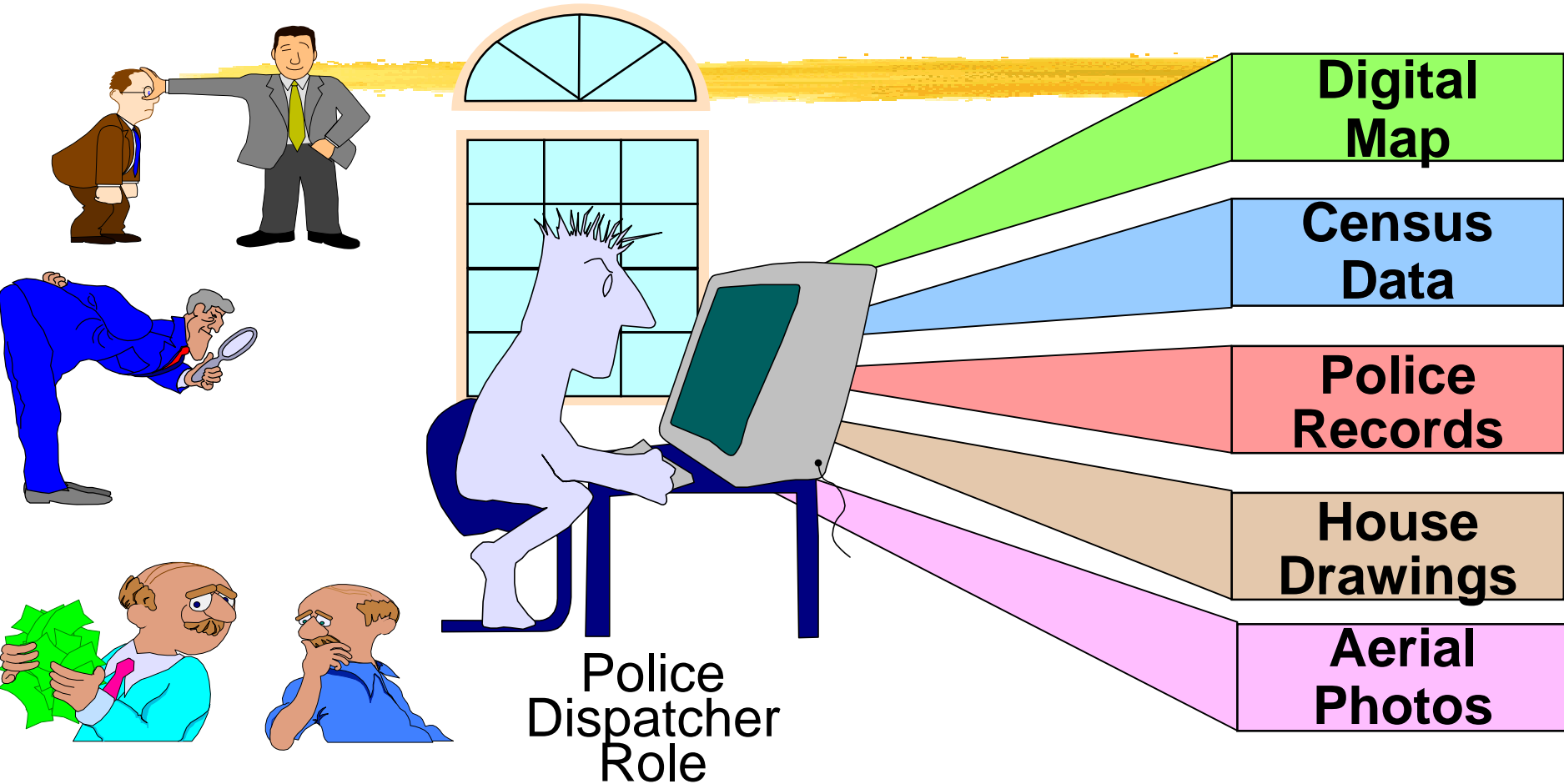
OORAM
Object Oriented
Role Analysis

UML
Collaborations

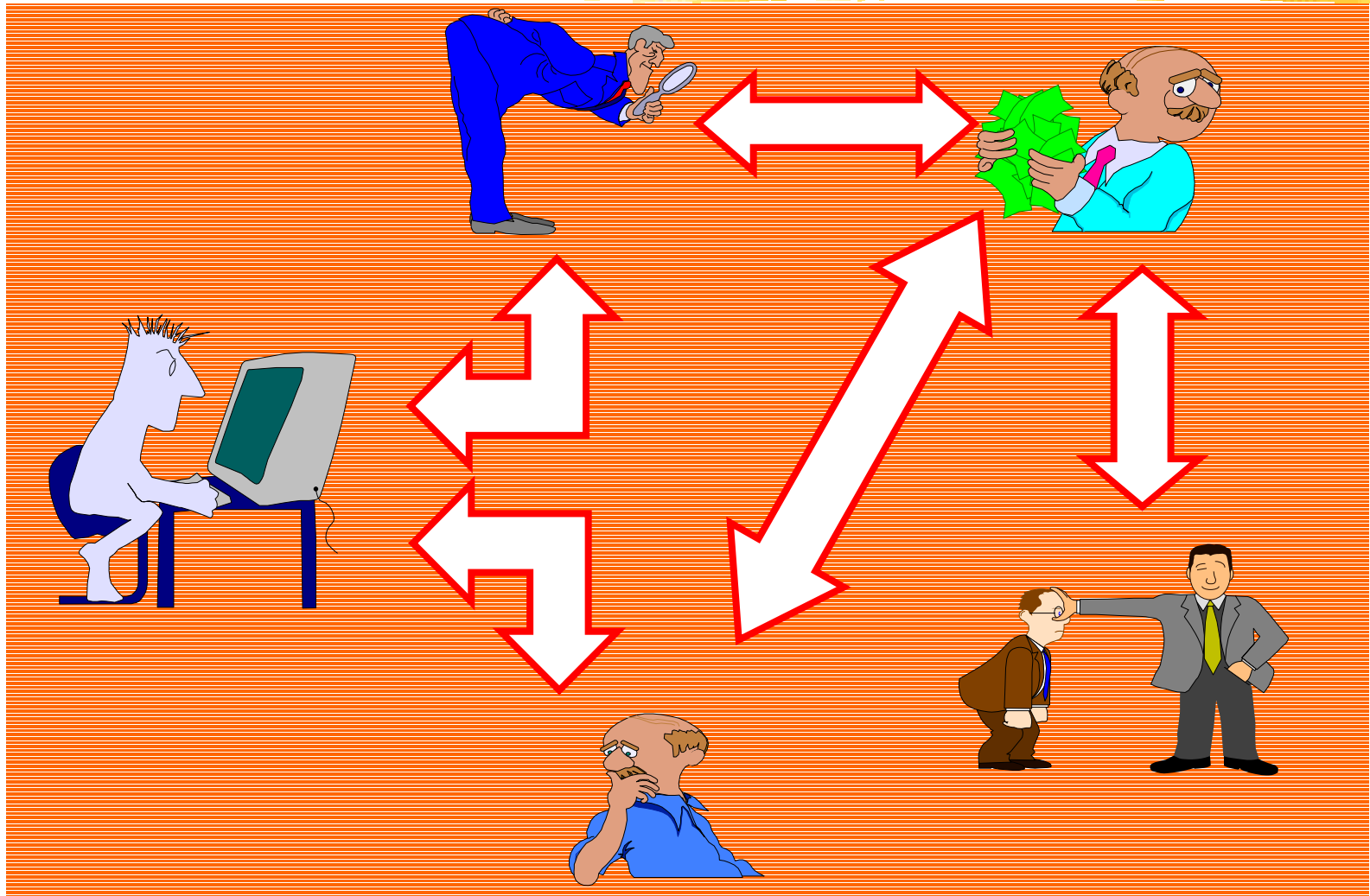
Enterprise
Collaboration
Architecture



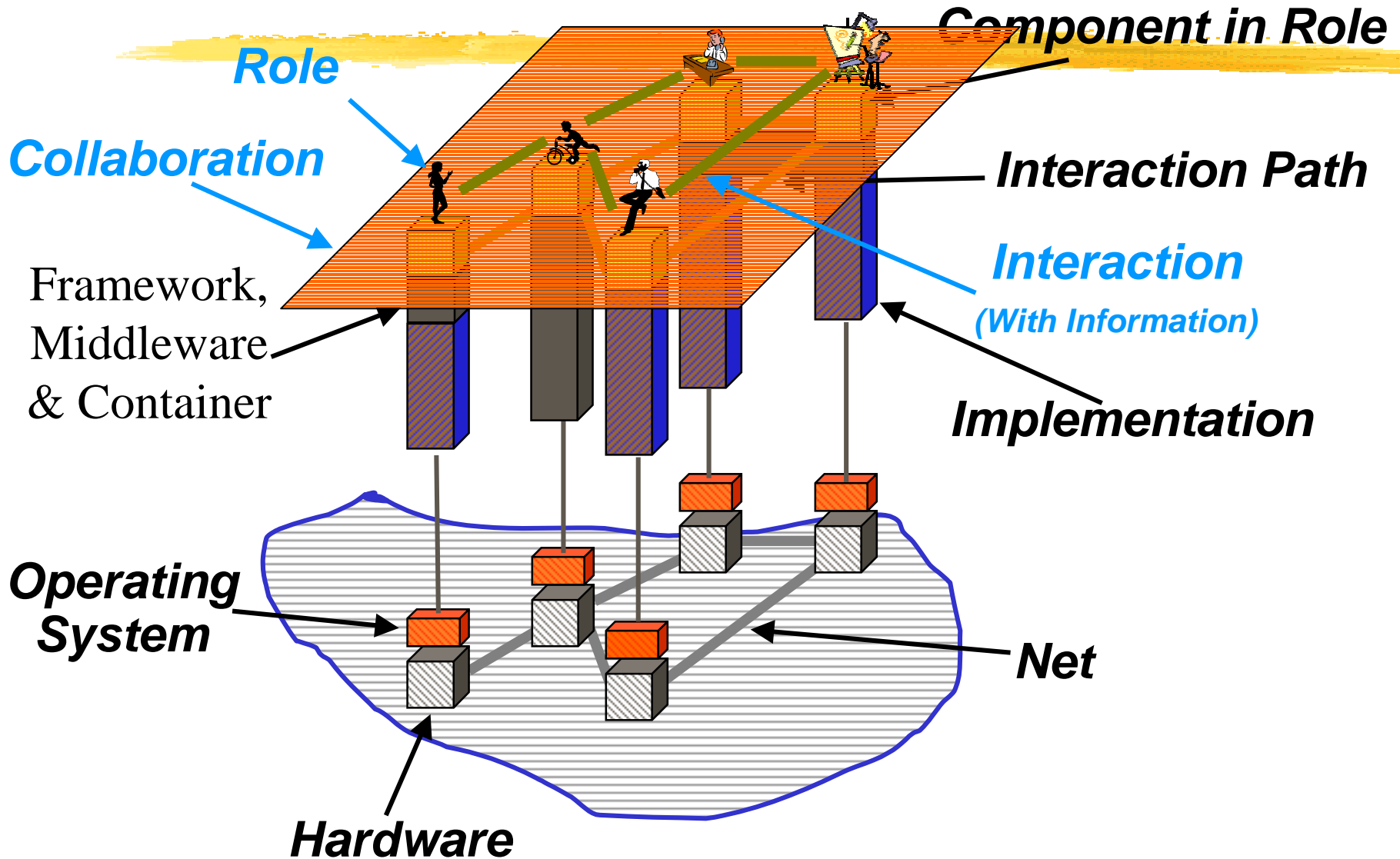
The Connected Enterprise Content and Communication




Multiple roles in a collaboration



Roles to Systems



Required elements for interoperability



- Connectivity standards and infrastructure
 - Providing the enterprise “bus” (Intranet)
 - http, Soap, ebXML
- Common processes and lexicon
 - What goes on the bus - the real business value!
 - Facilitating communities of practice
- Meta-model standards (UML, ebXML-BPSS, ECA...)
 - How to represent shared processes and information
- Repositories
 - Finding services, models and components for design time and runtime integration

Standards for Global Internet Computing

XML

WSDL

SOAP

XML-Schema



EDOC

.NET

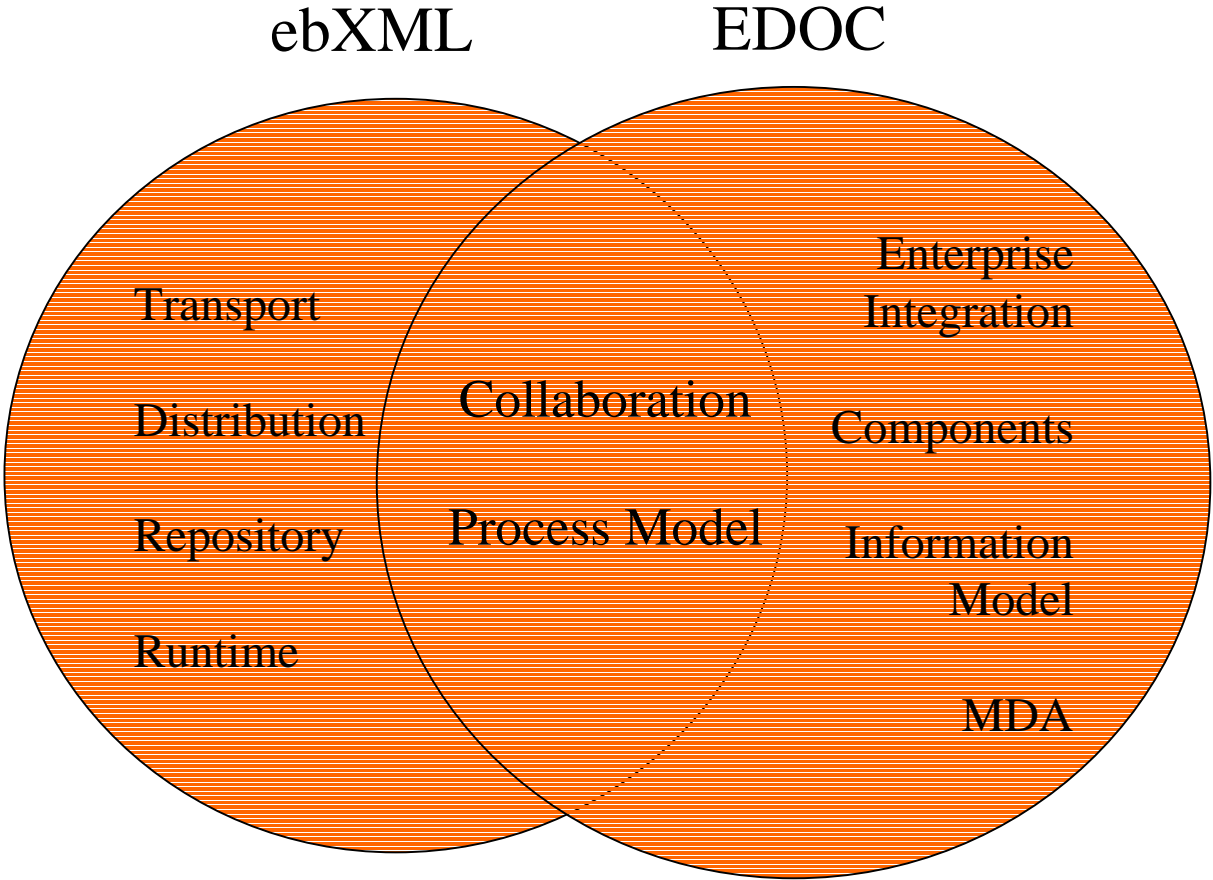
BPML

XLANG



Creating A Single Global Electronic Market

ebXML & EDOC



JSR 159



- Java Process Components
- Uses ECA (CCA) as the baseline component model
- Asynchronous document exchange
- Component composition
- A J2EE technology mapping for ECA
- Will make J2EE an excellent integration and web services platform

The WSEC RFP



- A Mapping from EDOC-Enterprise Collaboration Architecture to WSDL 1.1 with attachments and a SOAP binding.
- A Mapping from WSDL 1.1 with a Soap binding to the EDOC-Enterprise Collaboration Architecture.
- Any required extensions to the EDOC-Enterprise Collaboration Architecture to represent WSDL semantics.

EDOC Enterprise Collaboration Architecture

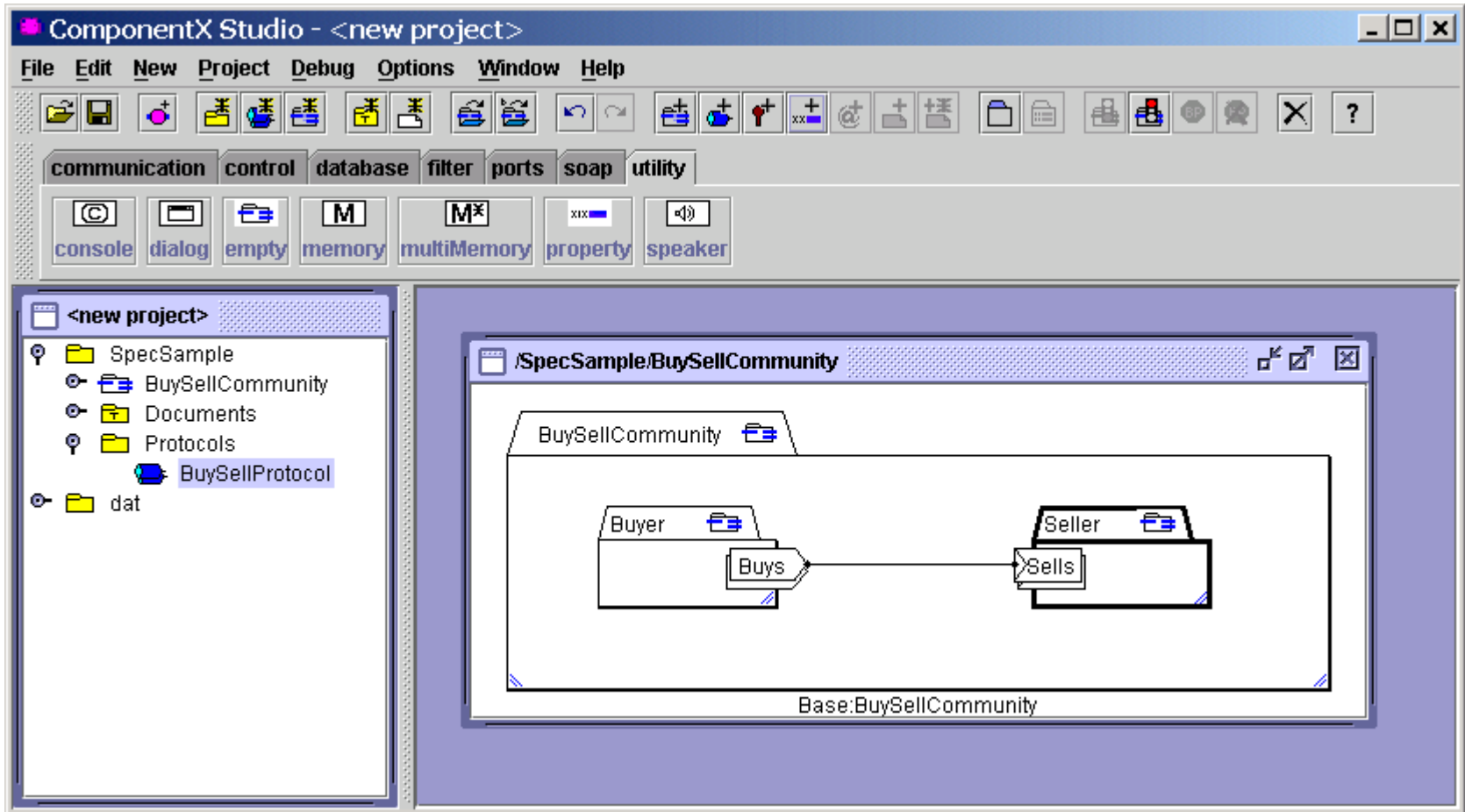


ECA

The logo consists of the letters 'E', 'C', and 'A' in a bold, sans-serif font. The letters are rendered in a 3D style with a gradient from orange to yellow. The 'E' is the largest and most prominent, with the 'C' and 'A' positioned to its right and slightly behind it, creating a sense of depth.

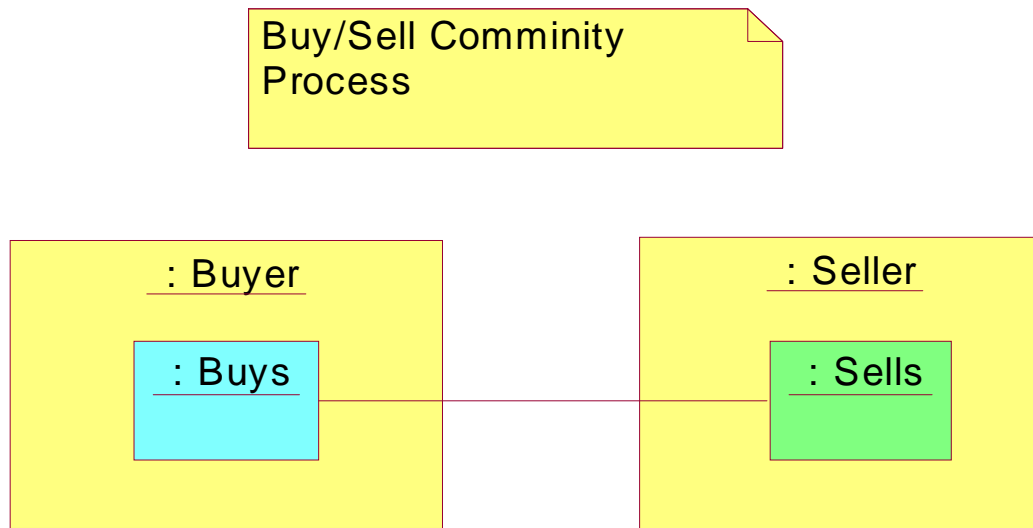
The model of
collaborative
work

Community Process (CCA)



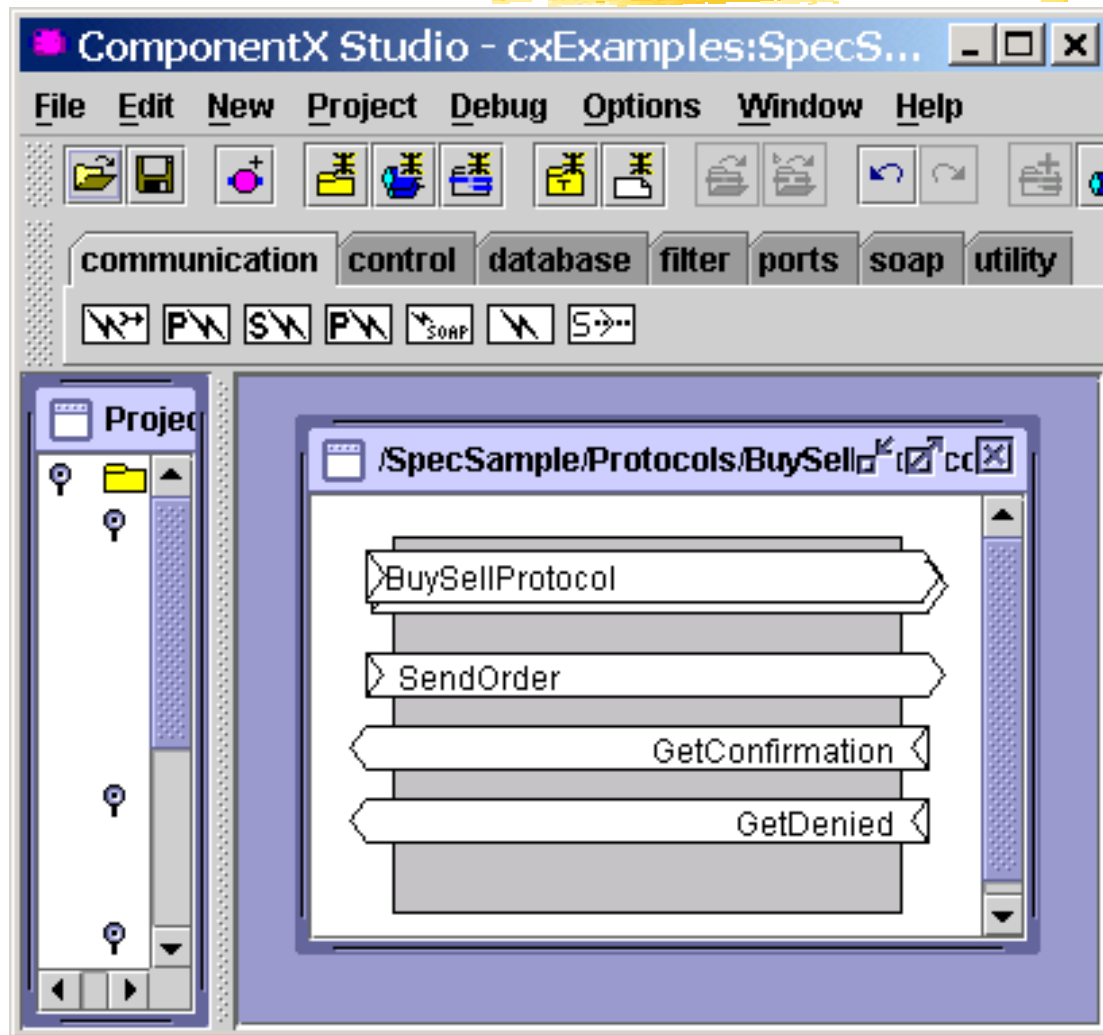
CCA Notation

Community Process

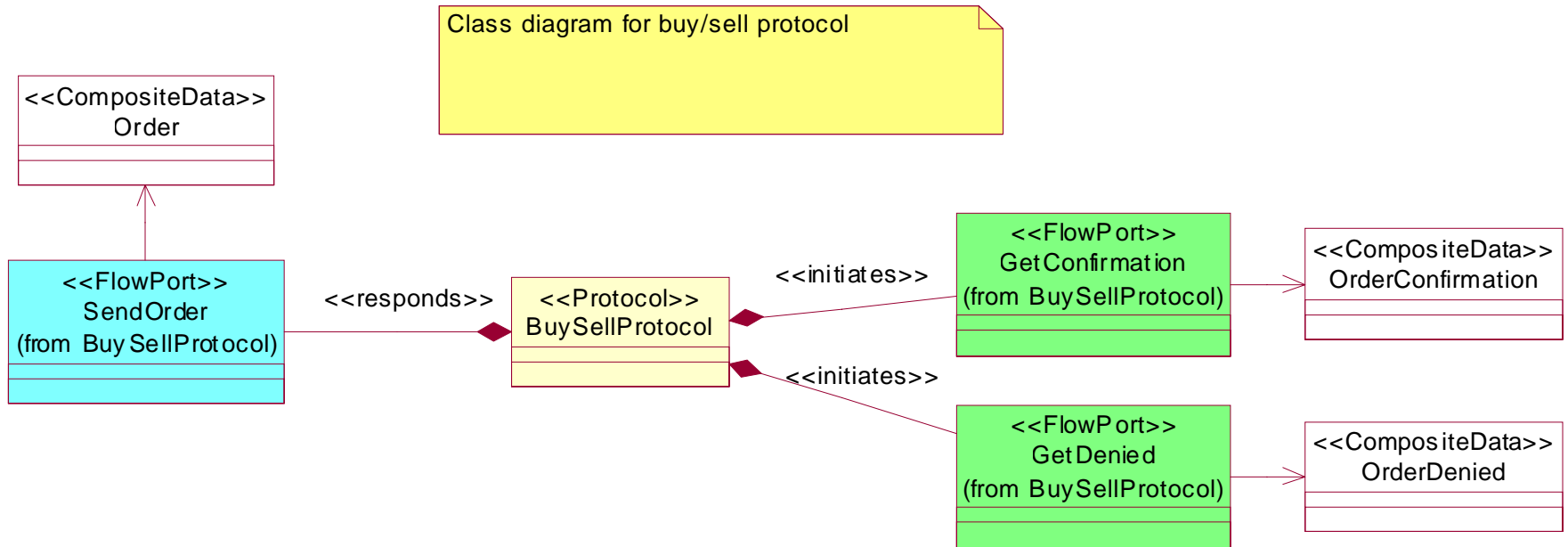


UML Collaboration Diagram

Protocol (CCA)

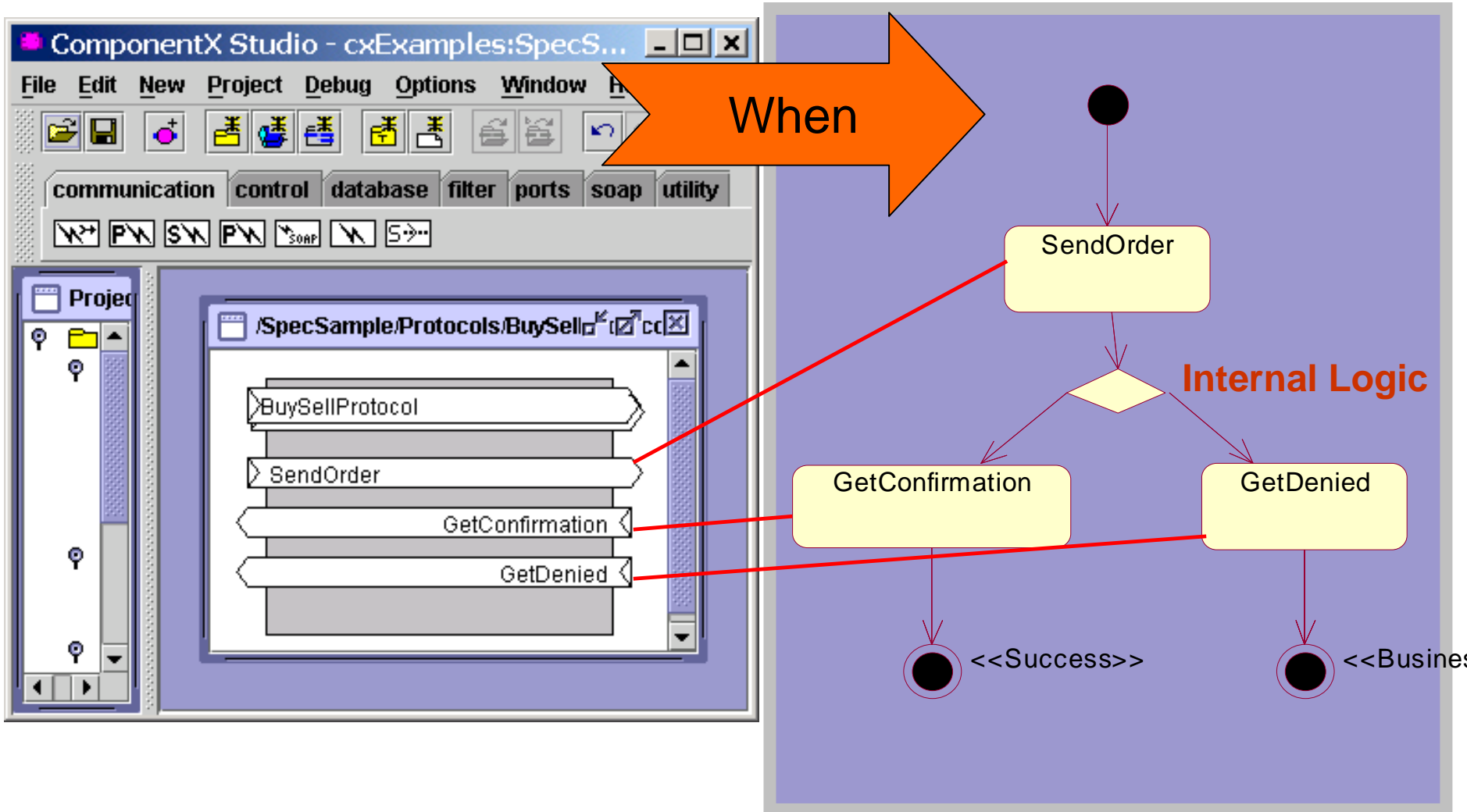


Protocol

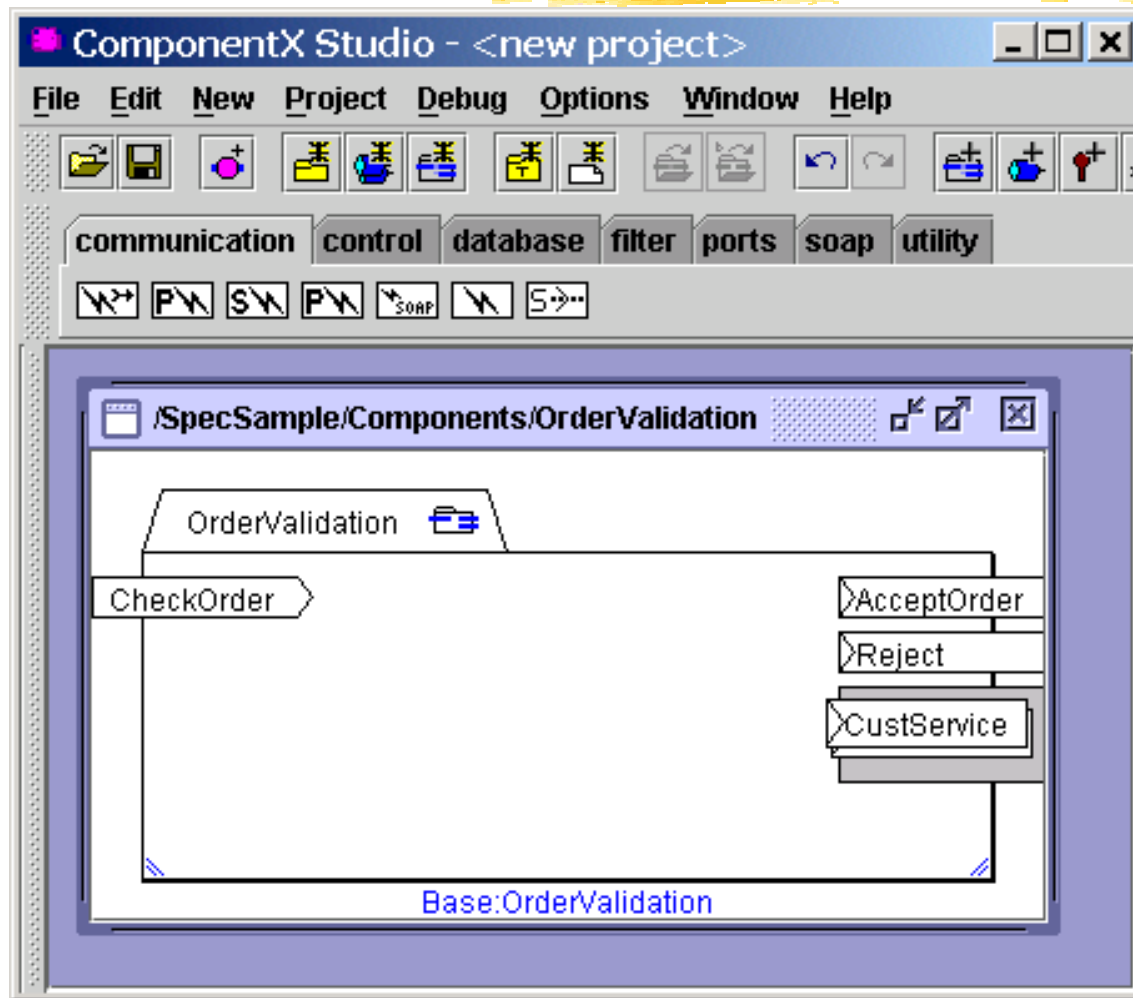


UML Class Diagram

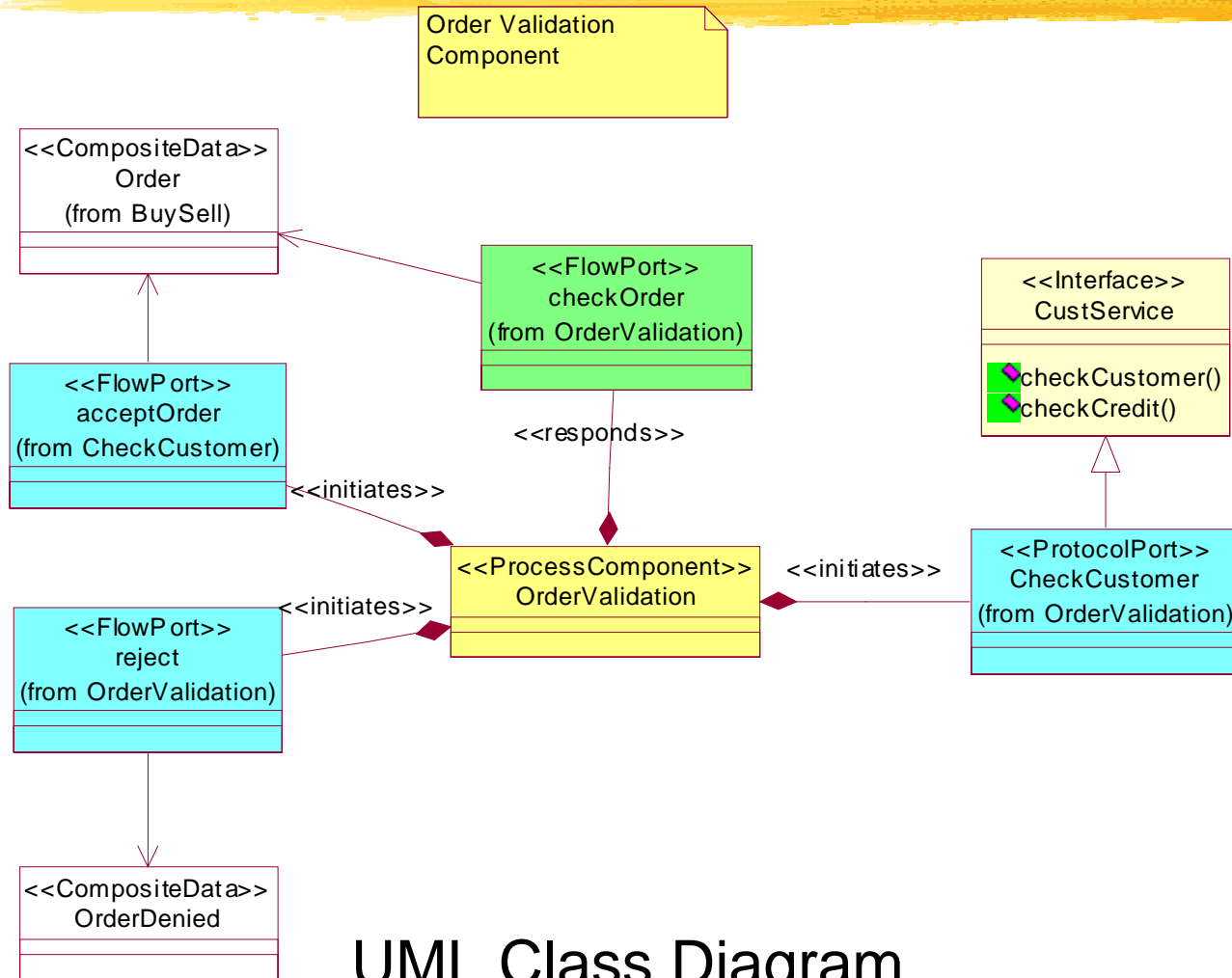
Protocol Choreography



Validation Component (CCA)

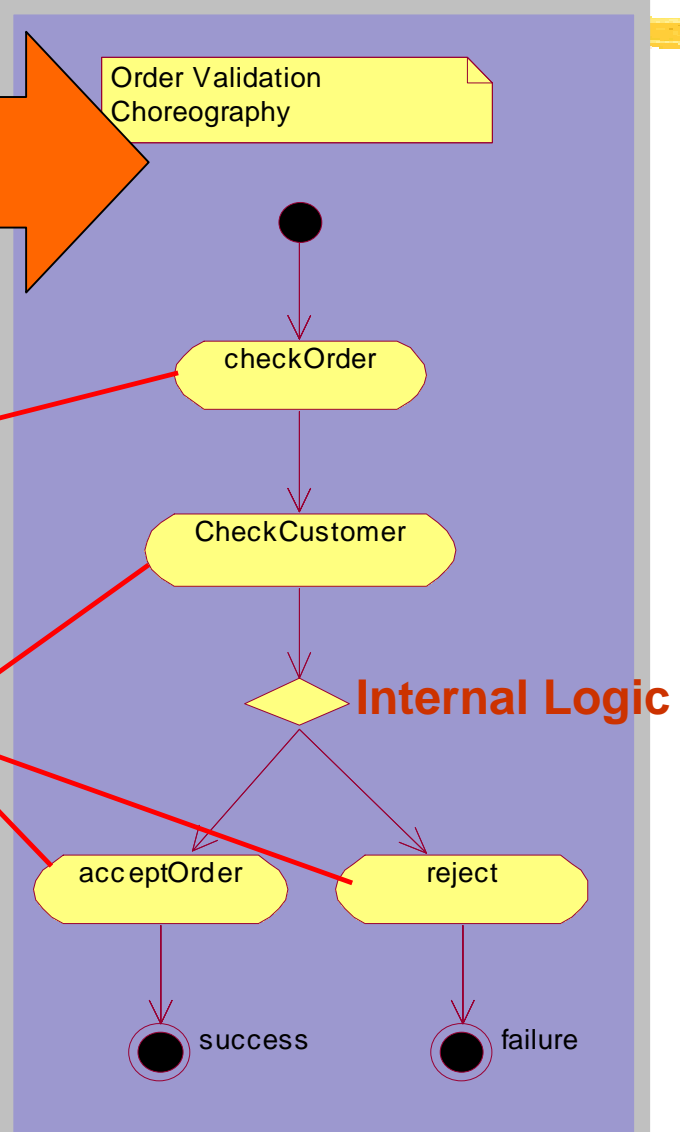
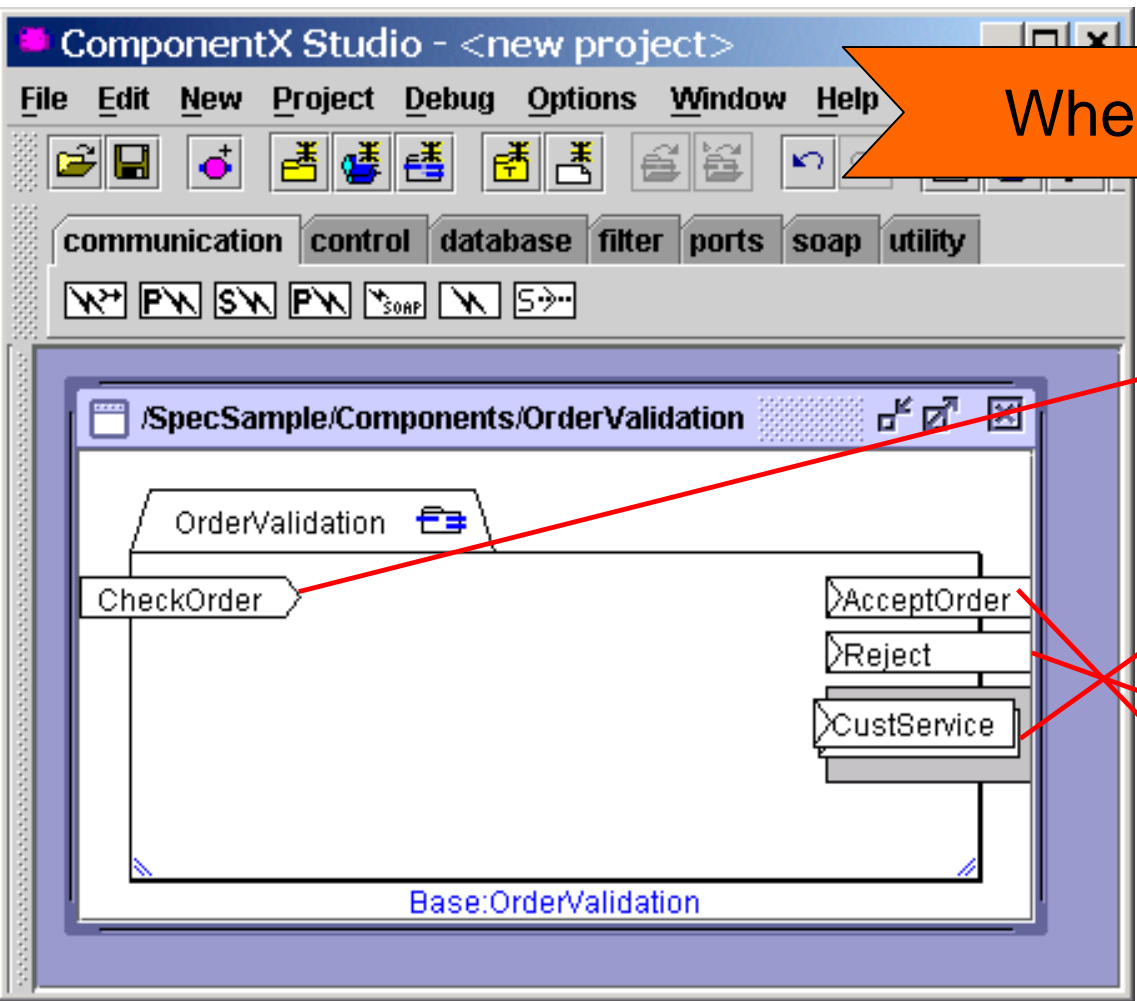


Validation Component



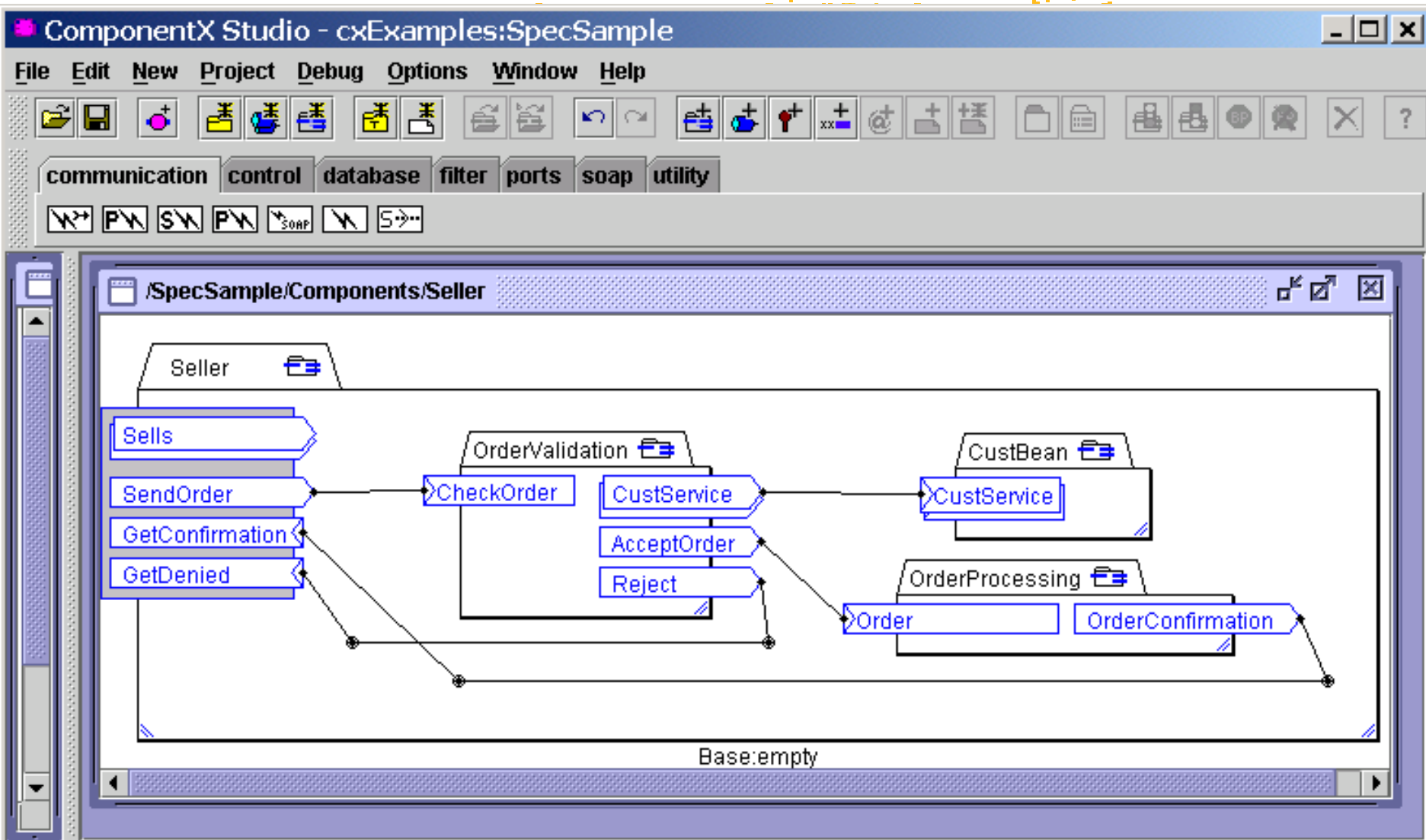
UML Class Diagram

Choreography



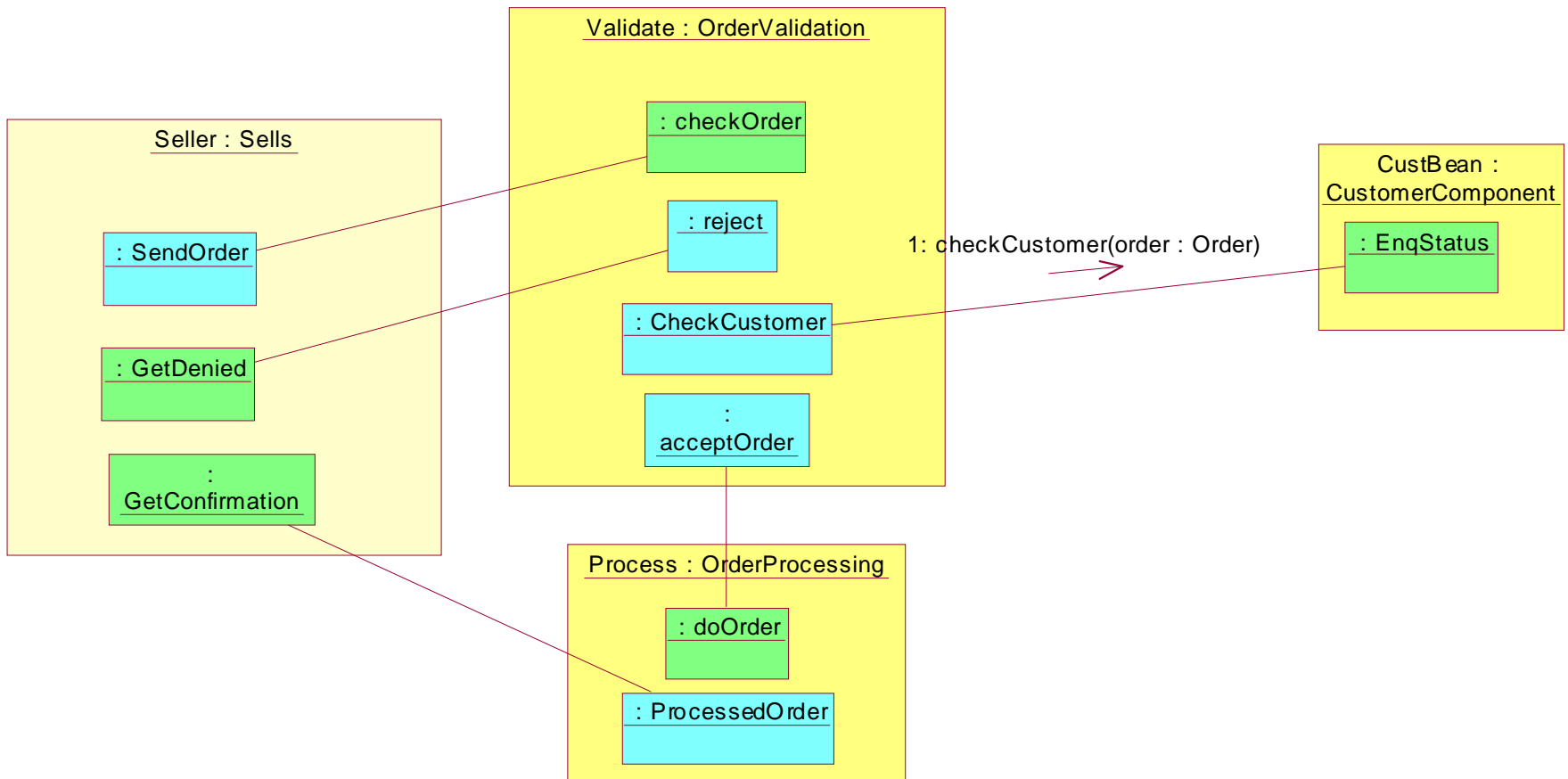
Internal Logic

Composition (CCA)

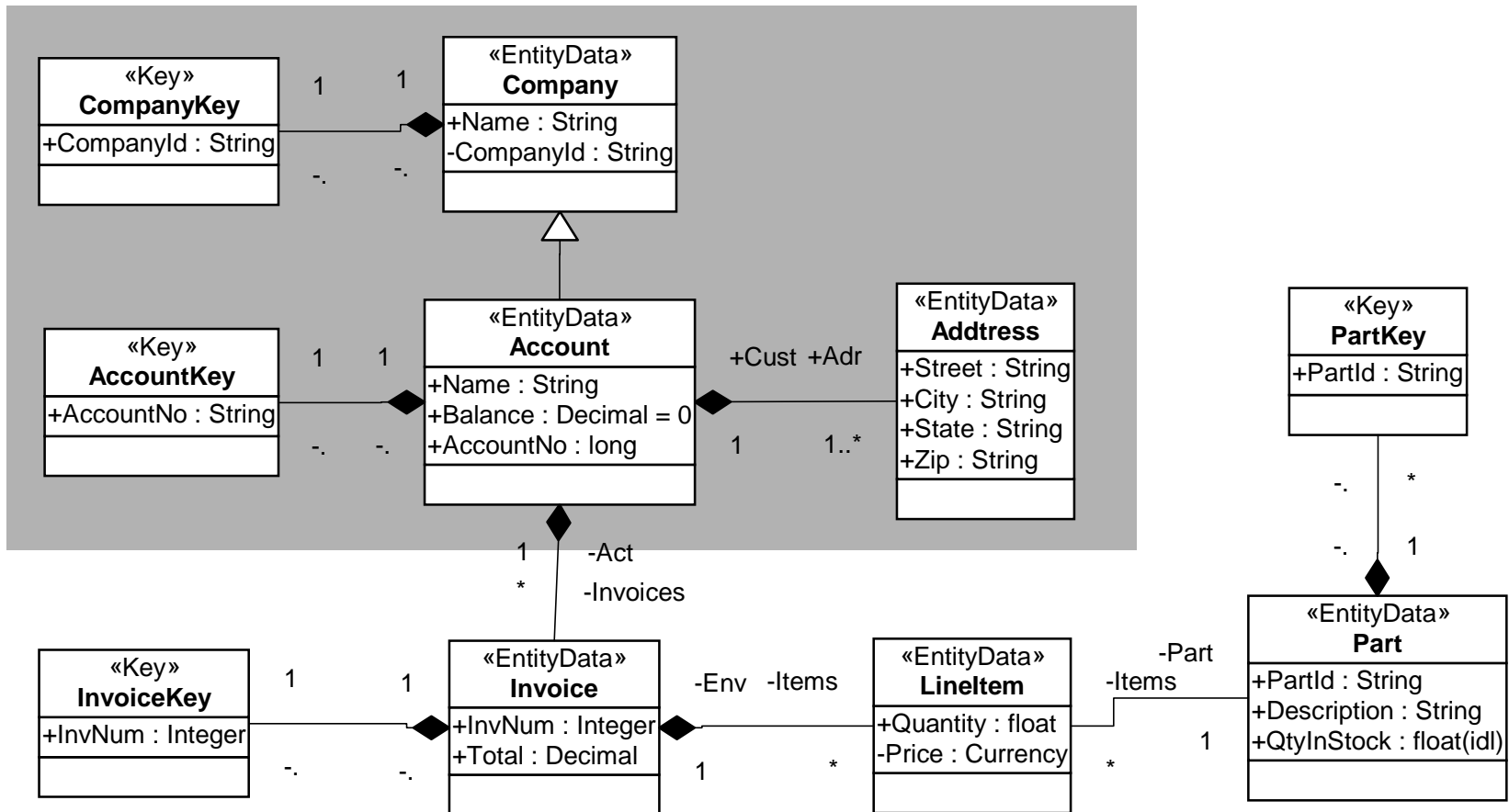


Composition (UML Collaboration)

Seller Composition

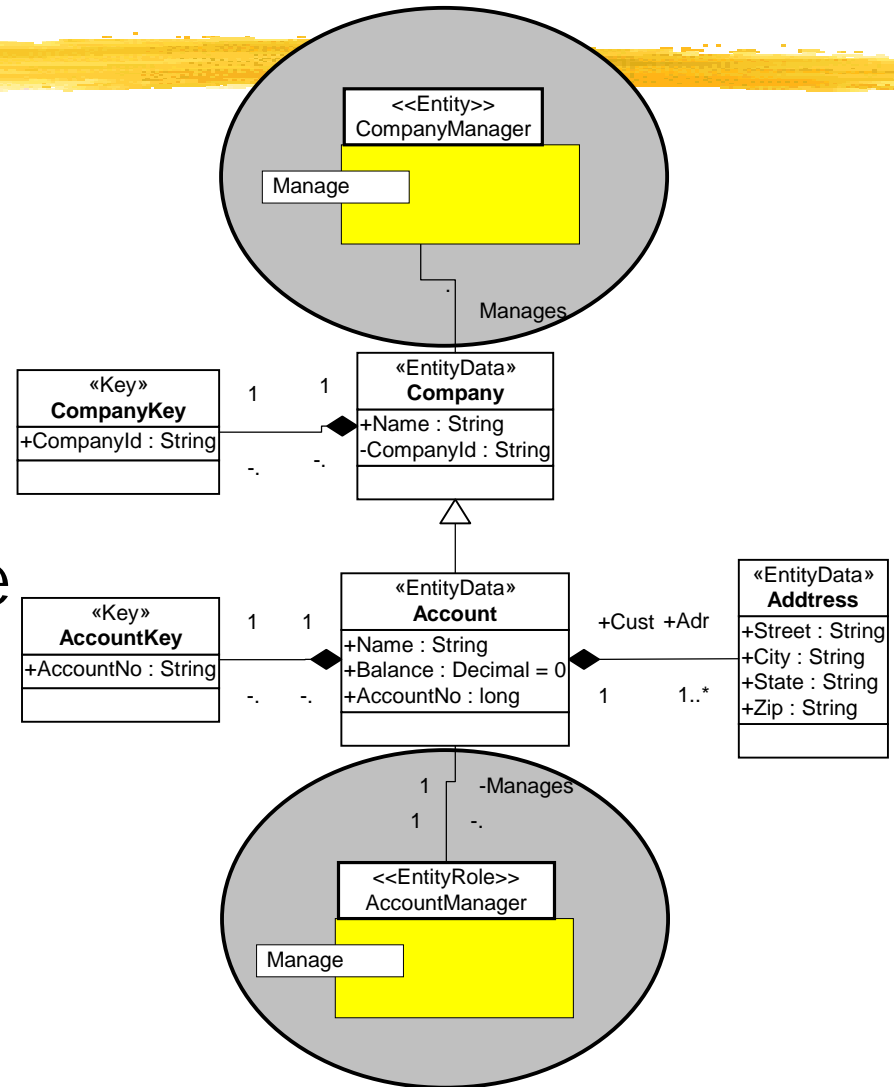


Sample Information Model



Adding Entities

- Entities are added to manage entity data
- Entity Roles are managers that provides a view of the same identity in another context
- The Entities have ports for managing and accessing the entities

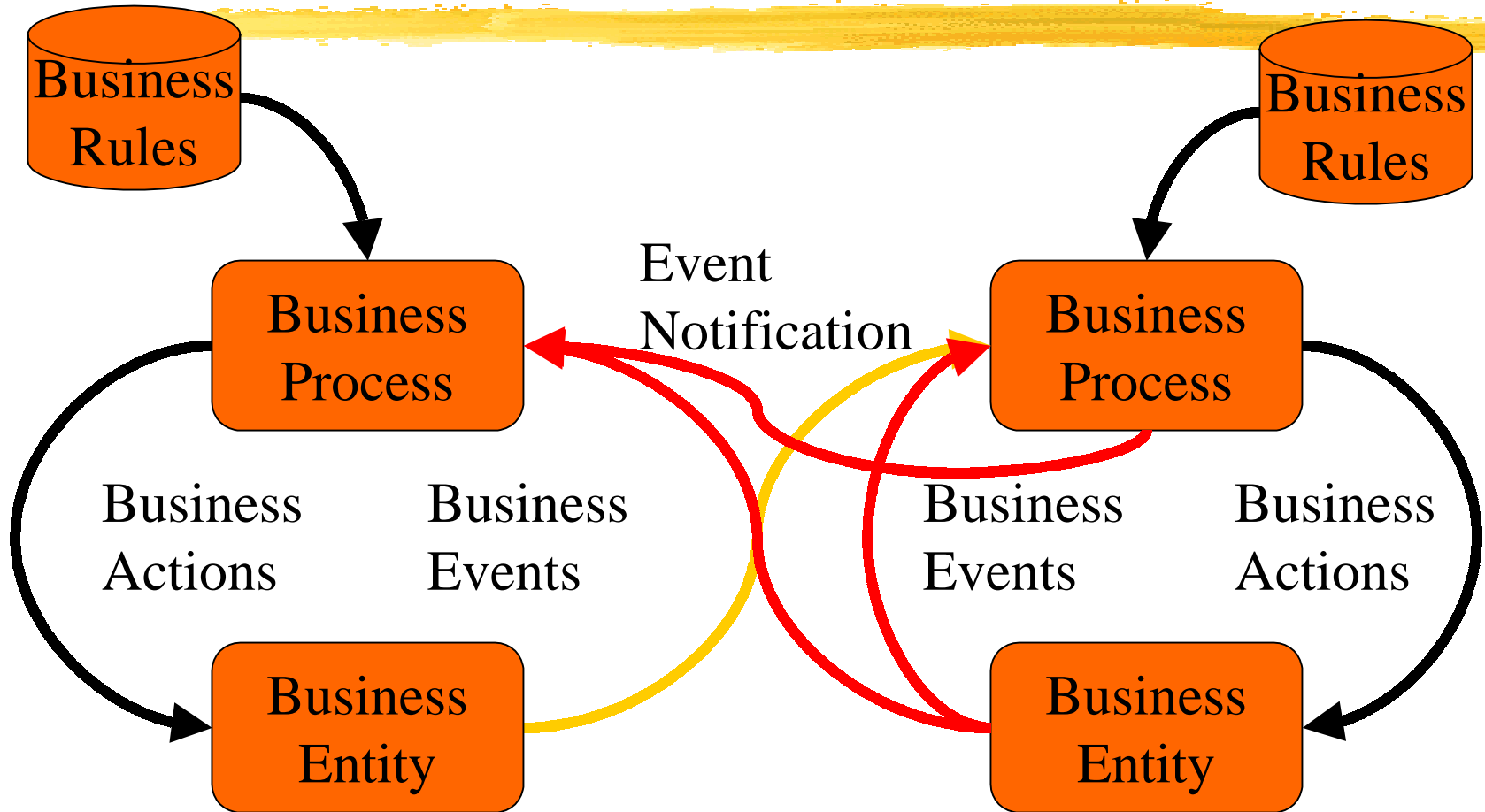


Modeling Events

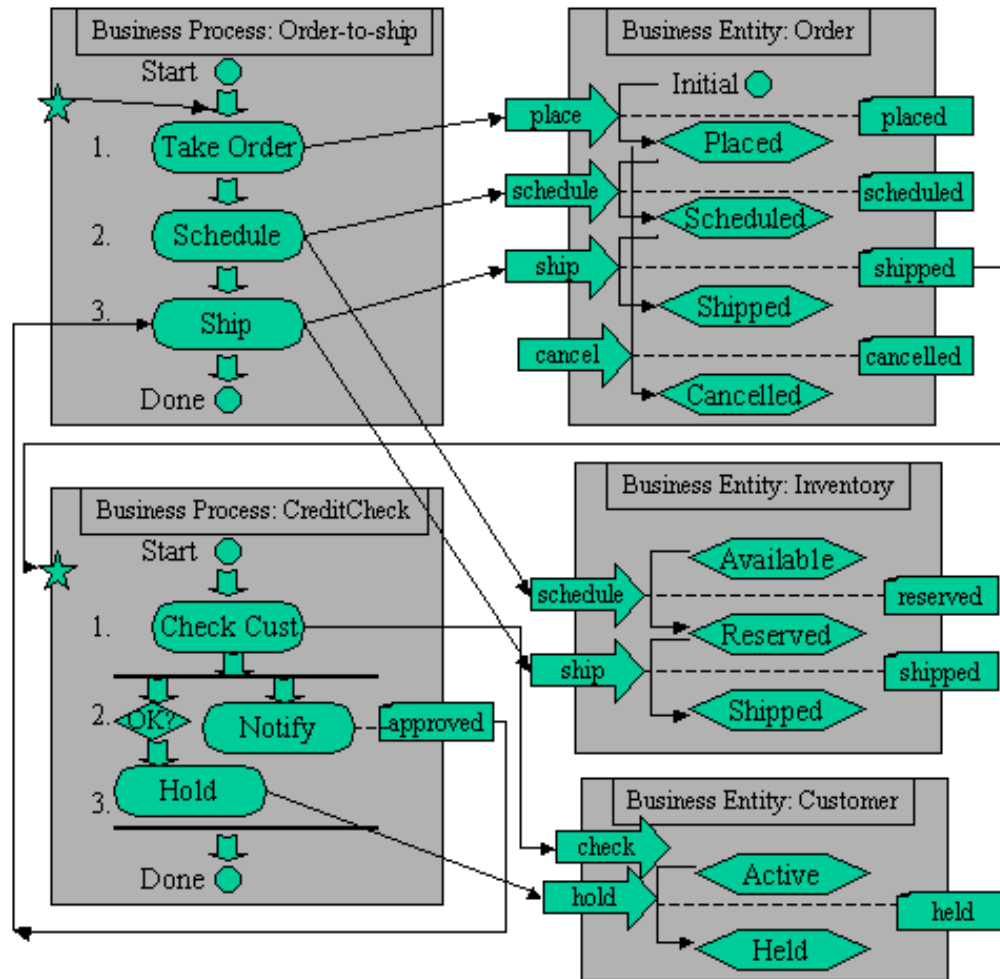


What to do when something happens

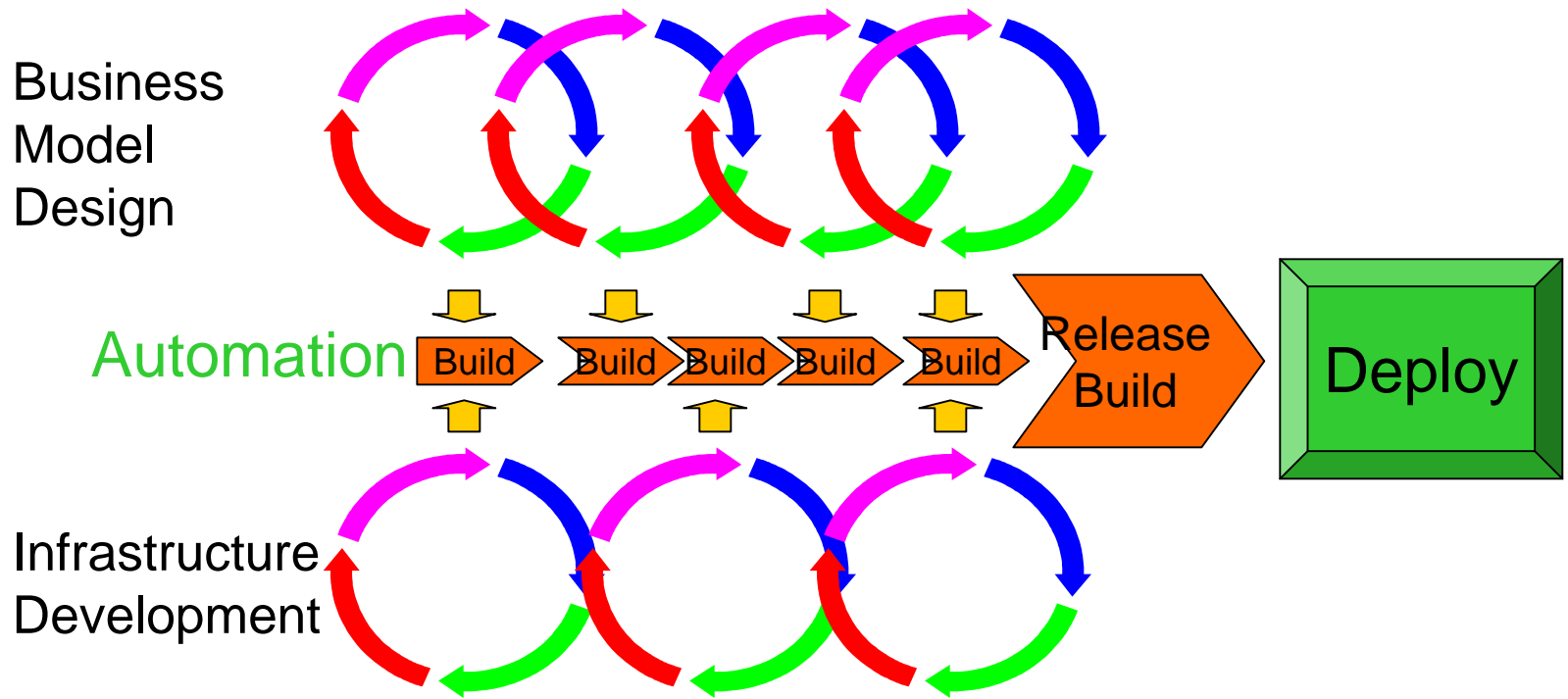
Event Based Business Processes



Event Example



Iterative Development



Summary



- Interoperability must exist for the contract of interaction as well as for protocols
- OMG has adopted MDA technology for interoperability and collaboration semantics based on UML
- Using MDA can help bring together divergent infrastructure and forms of specifications
- Processes are underway to provide mappings to a variety of middleware technologies
- Join with OMG to provide true interoperability with MDA and ECA