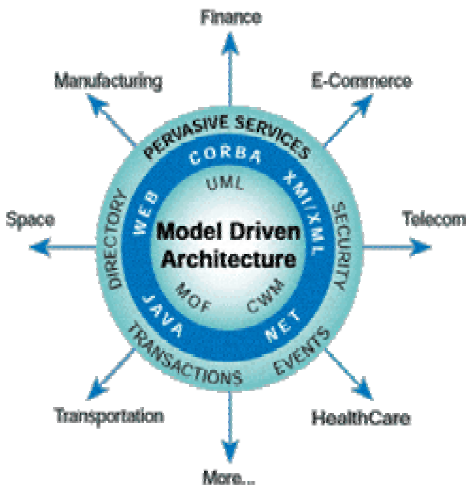
MDA for the Agile Enterprise



Enterprise
Collaboration
Architecture

EDOC

UNIFIED MODELING LANGUAGE™

Applying Model Driven Architecture to Executable Enterprise Architecture for Agility

Introductions

DataAccessTechnologies

Where Business Meets Technology

Cory Casanave

cory-c@enterprise-component.com

Primary author of “CCA” in EDOC

MDA Enables the *Agile Enterprise*

The MDA message is meaningful to the entire enterprise;

From the CEO to the Developer

The Agile Enterprise has a competitive advantage in its capability to embrace collaboration and change

Enterprise MDA

- Architecture at the Enterprise Level
  - Systems of systems
  - Collaboration of organizations, systems & people
  - Wide-scale collaborative processes
    - roles and responsibilities
  - Service Oriented Architecture
  - Enterprise Components
  - Componentizing functionality – not creating it
  - Executable processes – smooth transition from model to simulation to solution
- Executable Enterprise Architecture

Copyright © 2000-2002, Data Access Technologies, Inc.

Goals

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

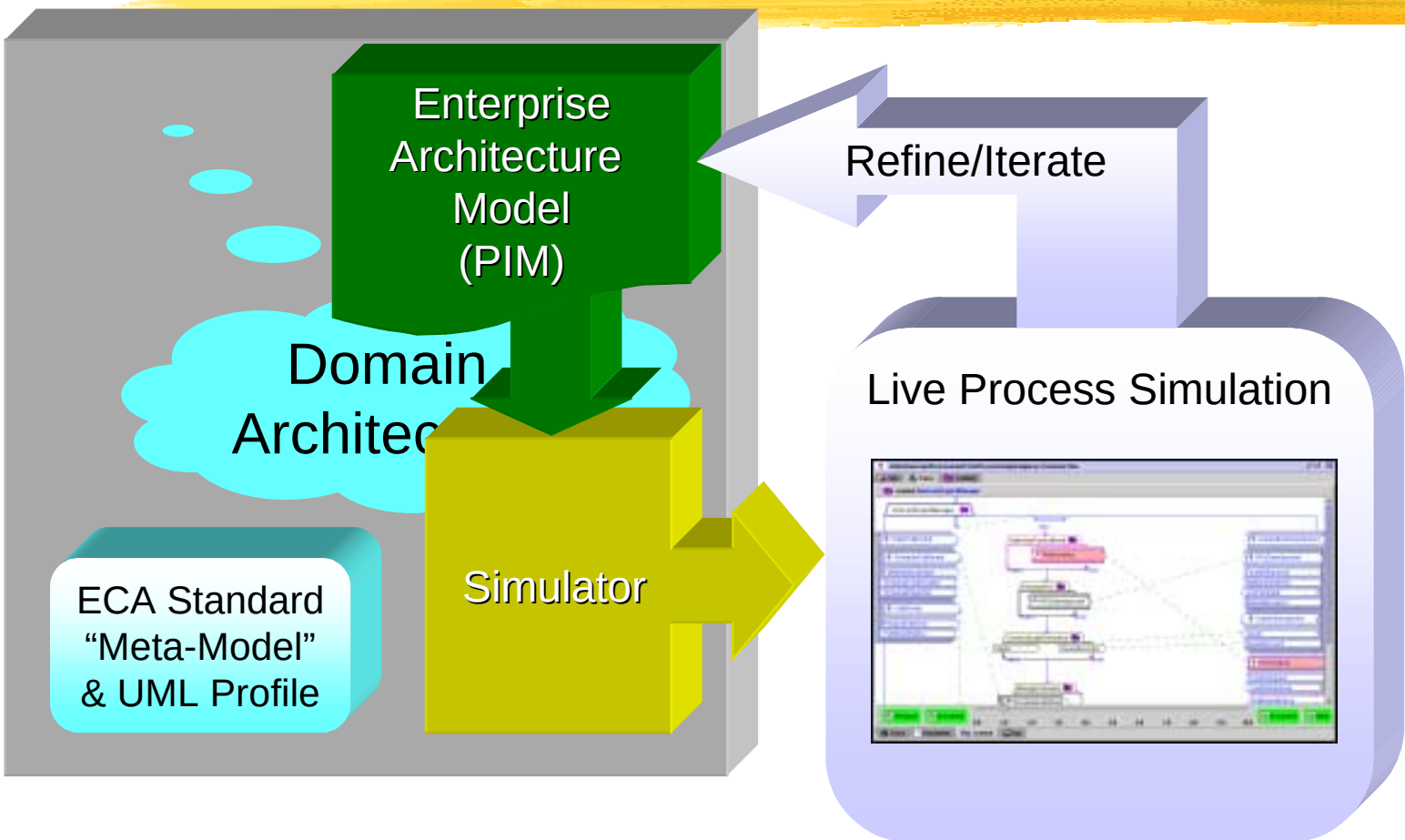
Copyright © 2000-2002, Data Access Technologies, Inc.

The OMG-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 *modeling enterprise systems*.
- 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 Profile for UML specification.

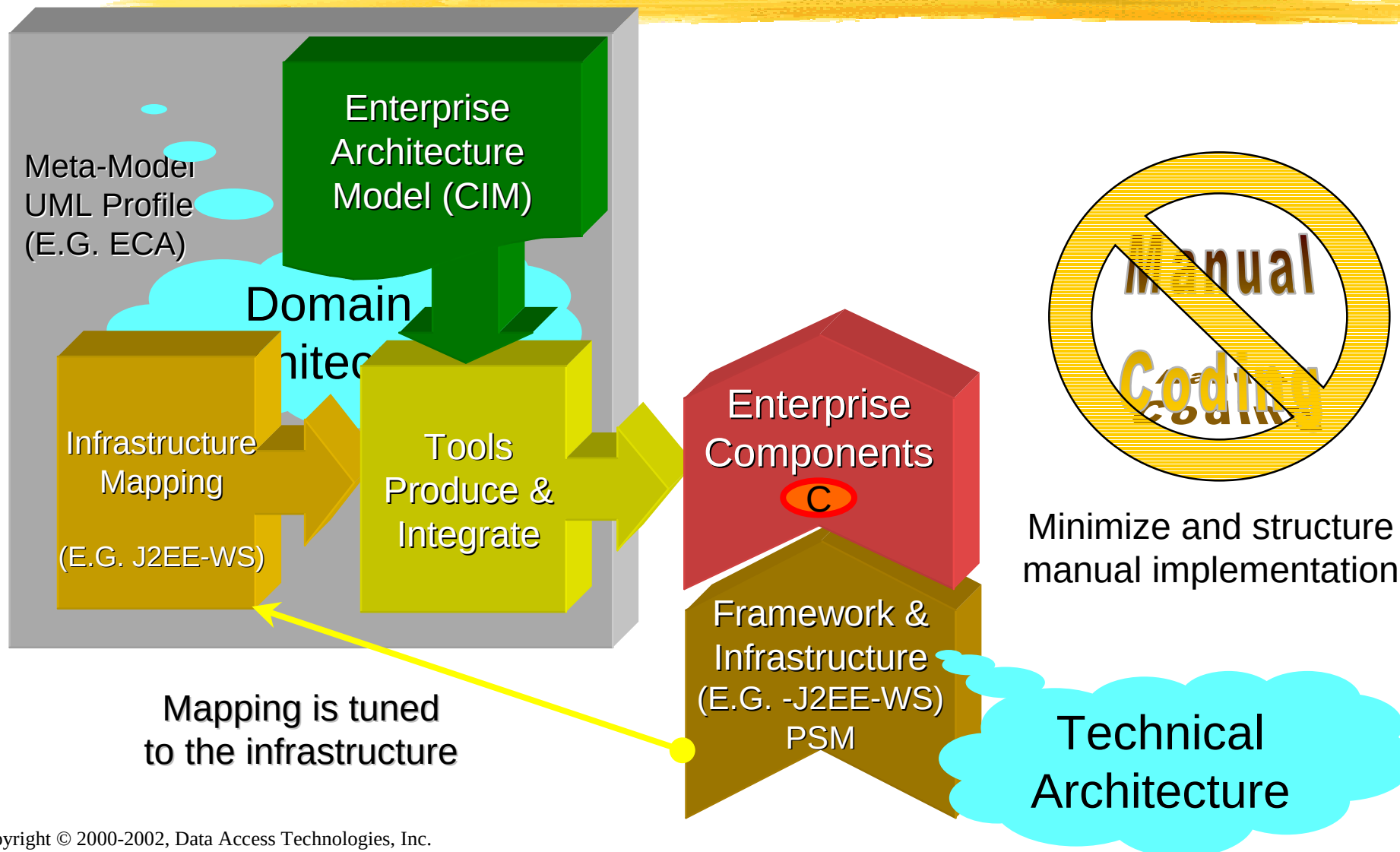
Copyright © 2000-2002, Data Access Technologies, Inc.

Simulated Model Driven Architecture



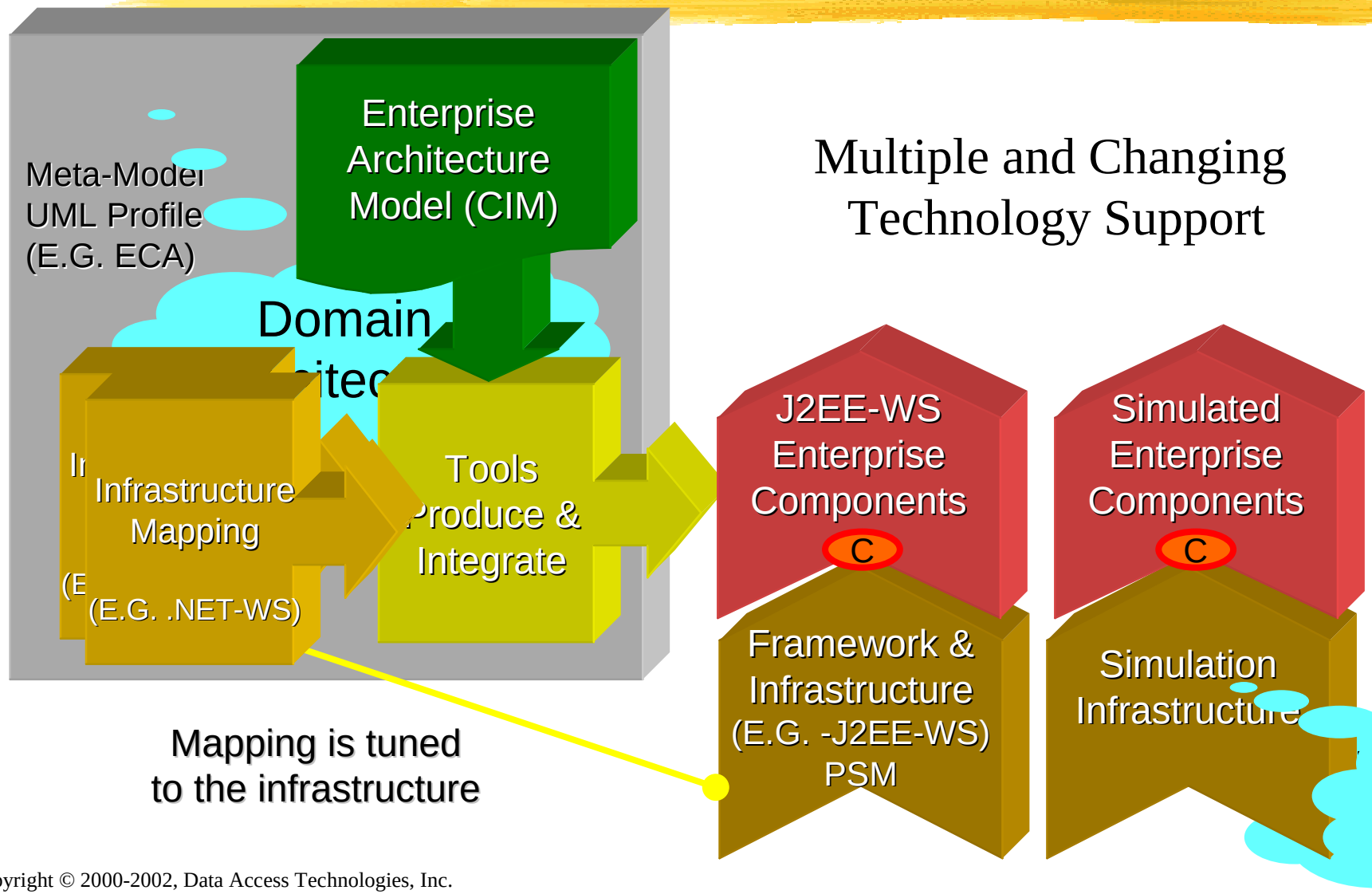
Copyright © 2000-2002, Data Access Technologies, Inc.

Automated Model Driven Architecture



Copyright © 2000-2002, Data Access Technologies, Inc.

Automated Model Driven Architecture



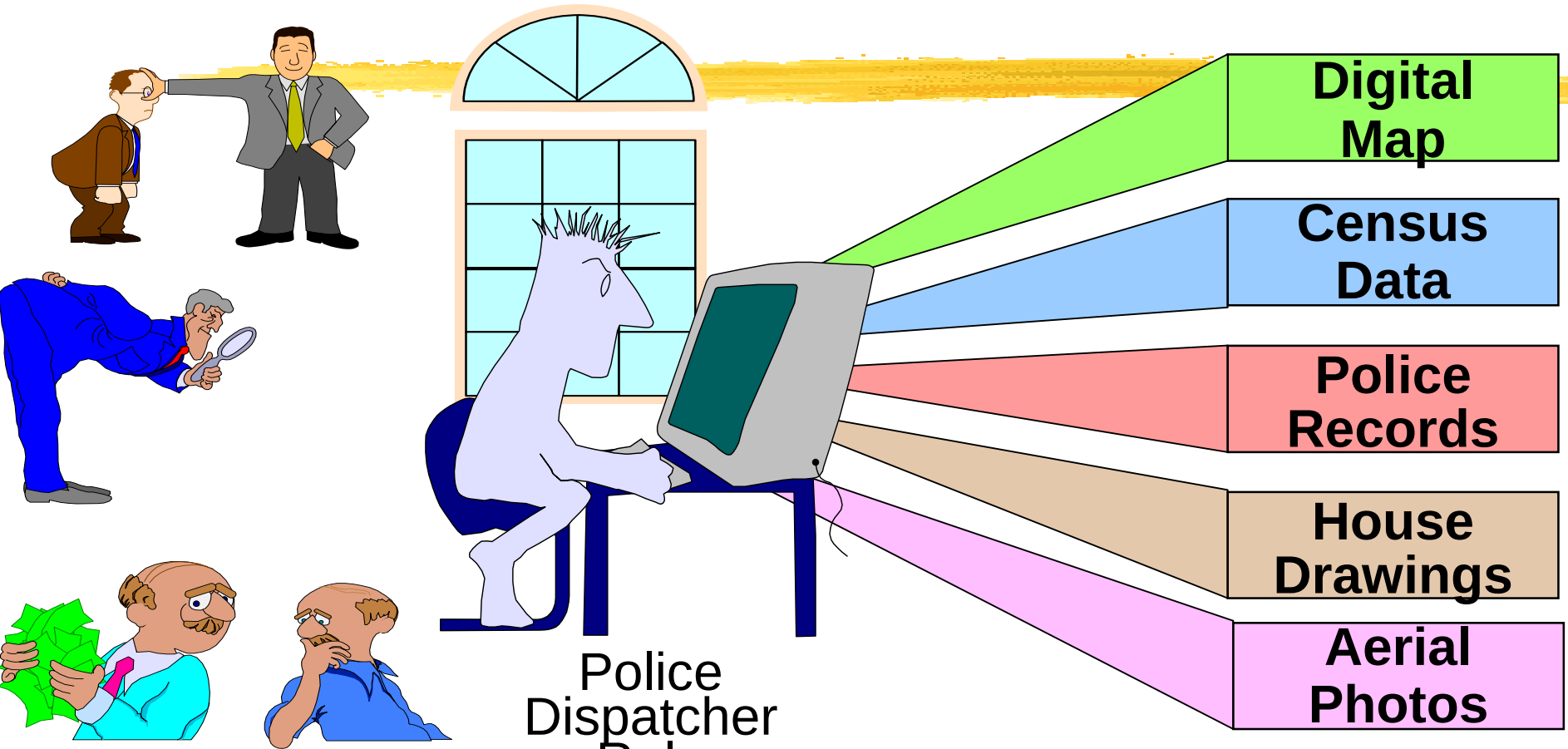
Copyright © 2000-2002, Data Access Technologies, Inc.

The new center

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

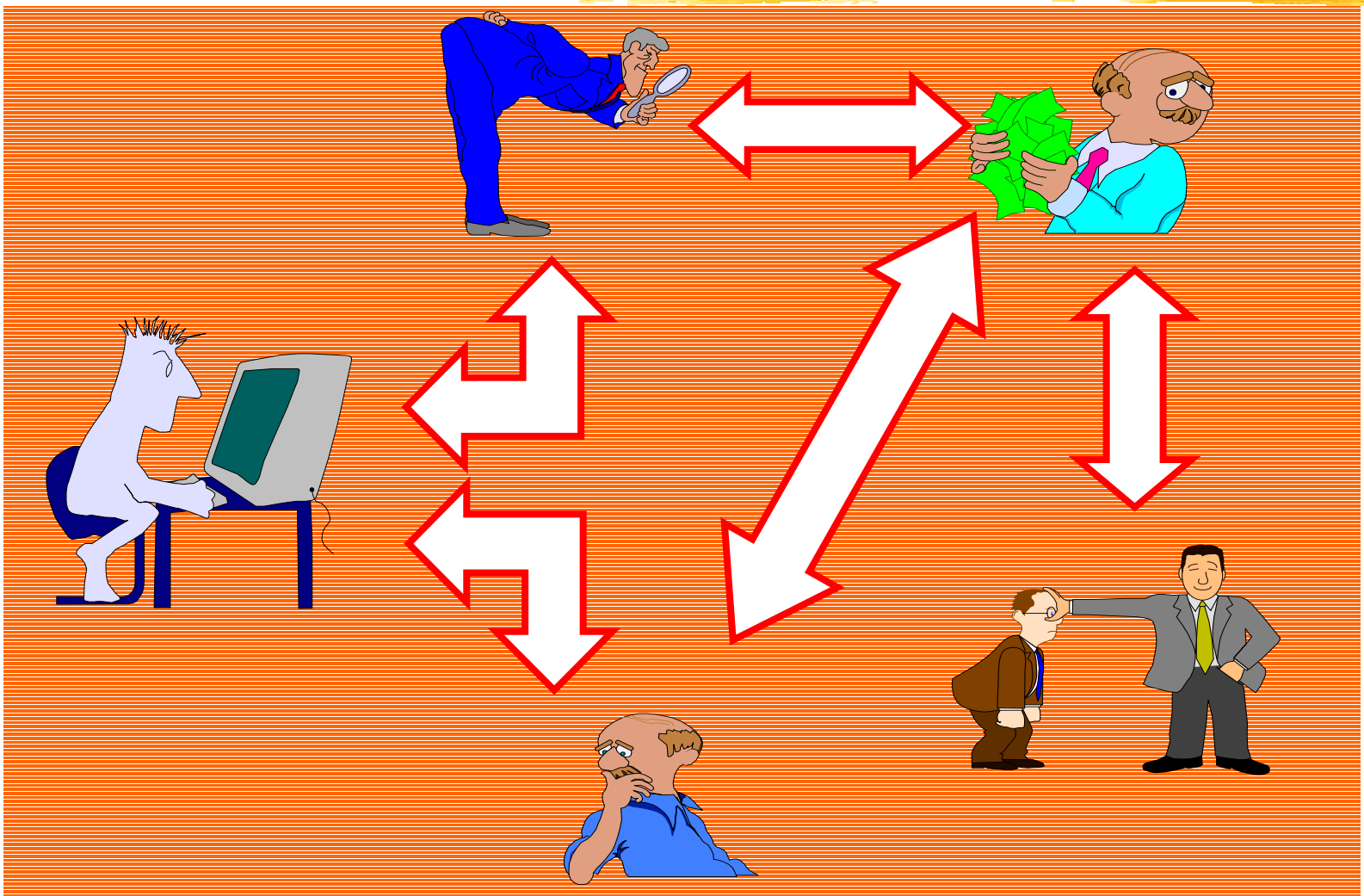
Copyright © 2000-2002, Data Access Technologies, Inc.

The Connected Enterprise
Content and Communication



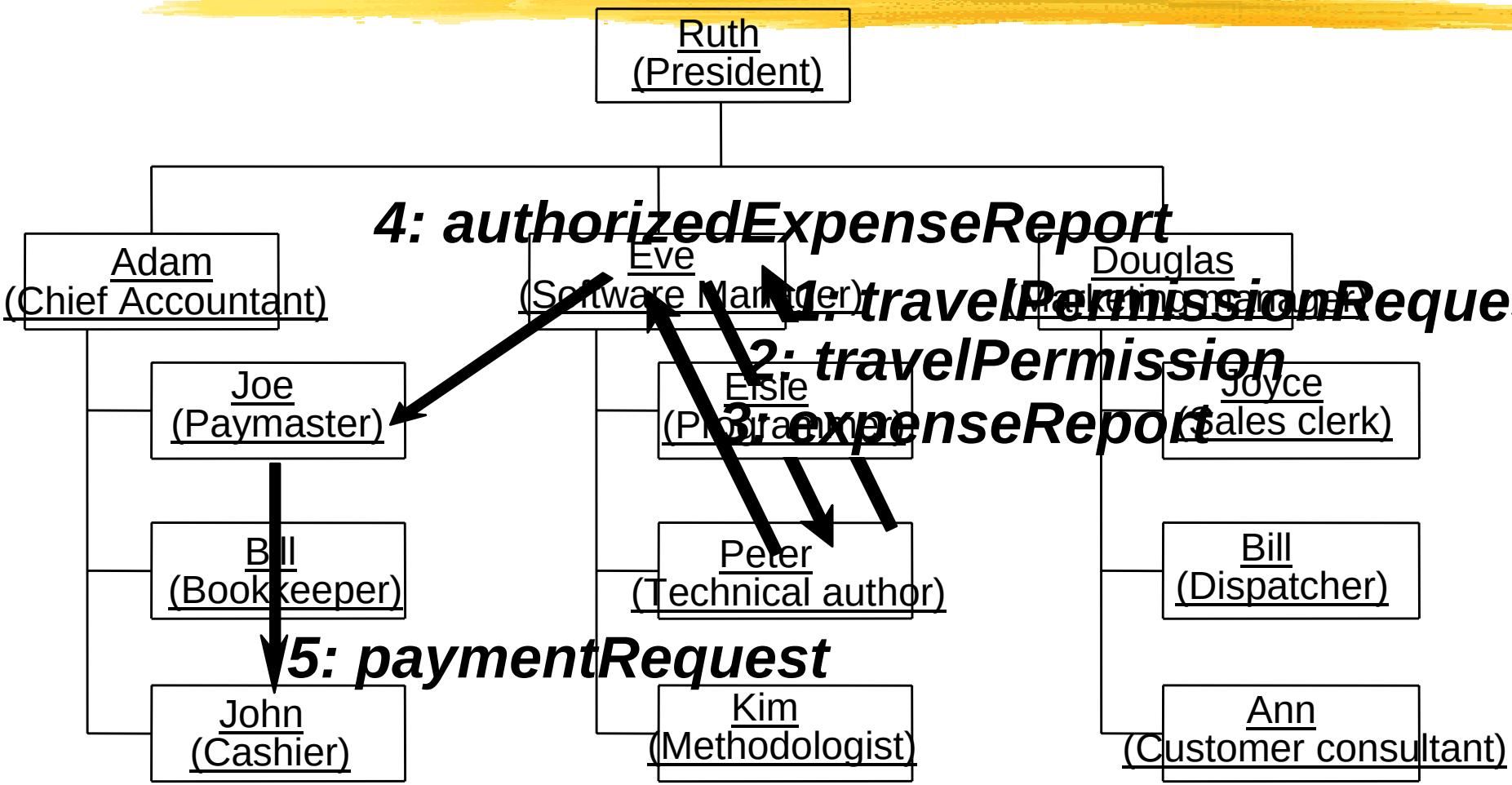
Copyright © 2000-2002, Data Access Technologies, Inc.

Multiple roles in a collaboration



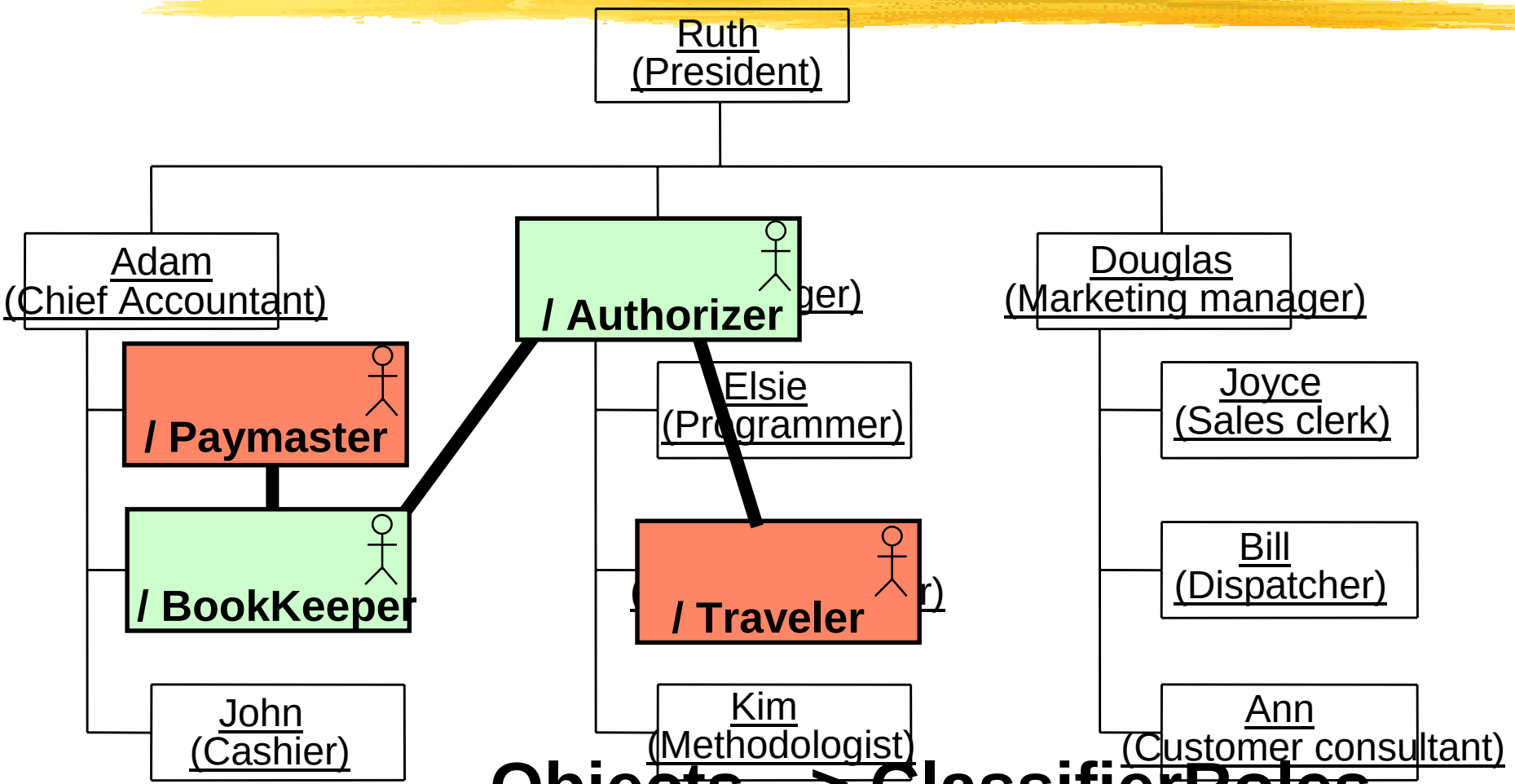
Copyright © 2000-2002, Data Access Technologies, Inc.

Travel Expense Example



Copyright © 2000-2002, Data Access Technologies, Inc.

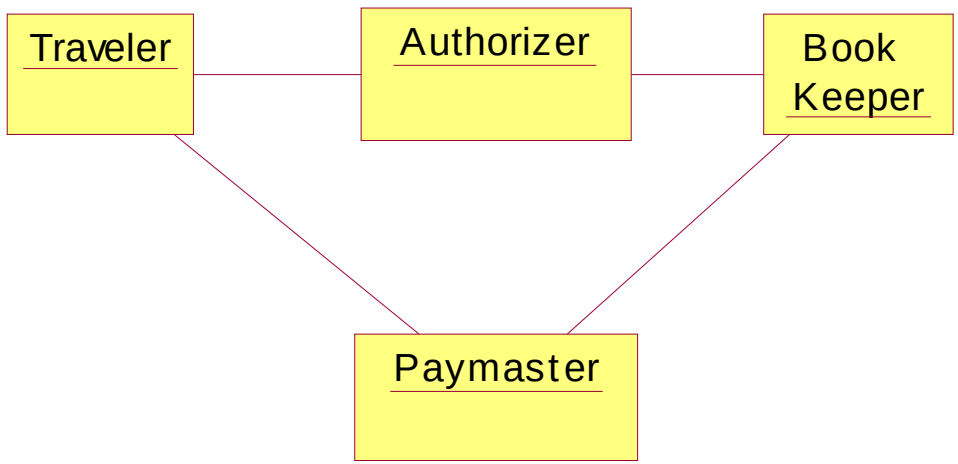
Diagram
Travel Expense Model



Objects --> ClassifierRoles

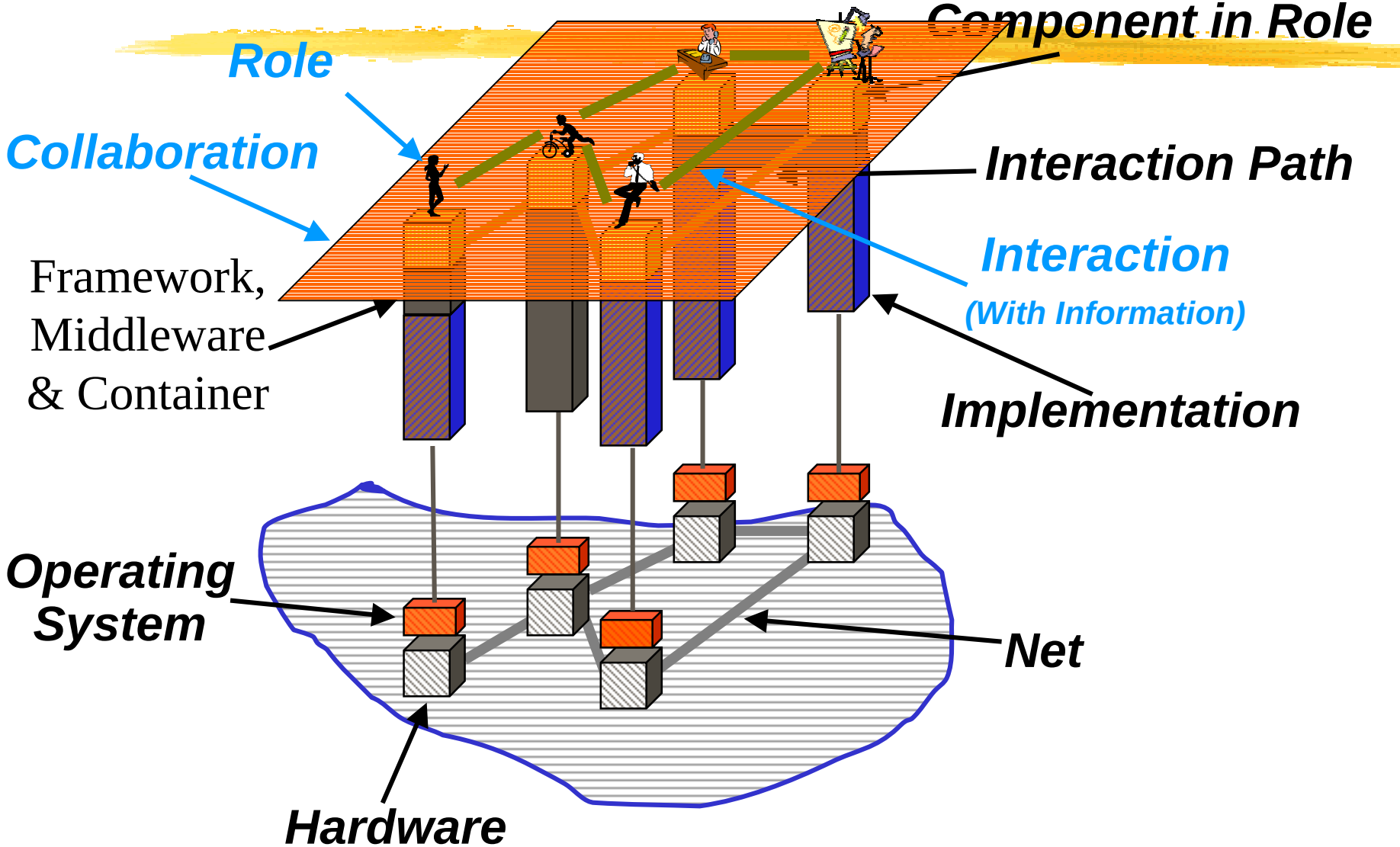
Copyright © 2000-2002, Data Access Technologies, Inc.

Collaboration Diagram



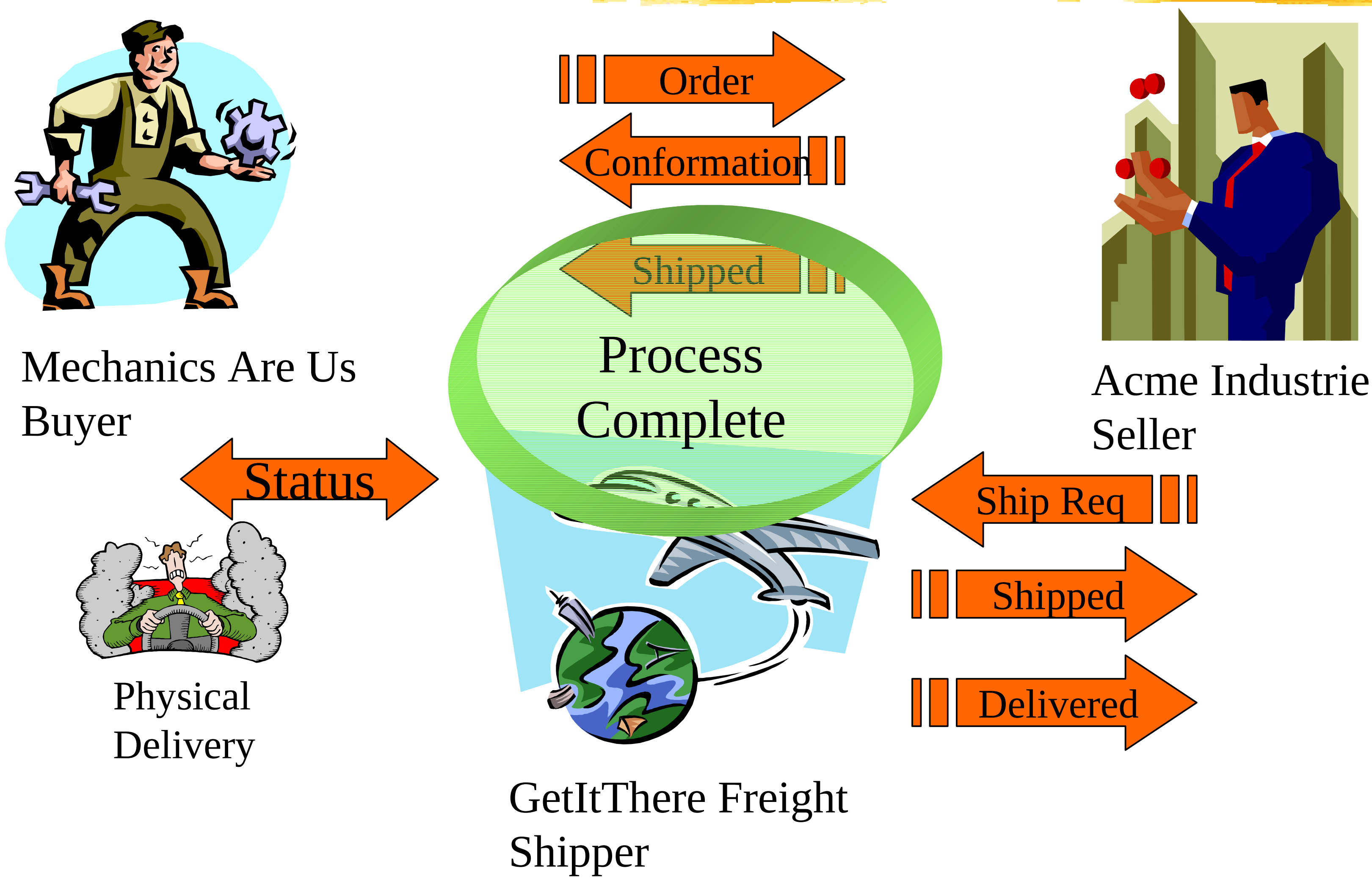
Copyright © 2000-2002, Data Access Technologies, Inc.

Roles to Systems



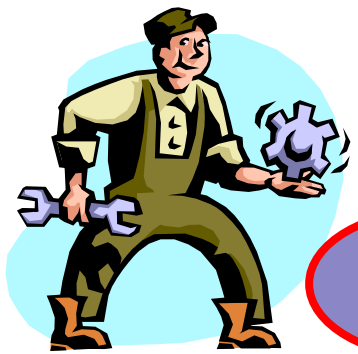
Copyright © 2000-2002, Data Access Technologies, Inc.

The Marketplace Example



Copyright © 2000-2002, Data Access Technologies, Inc.

Where are the services?



Web Service

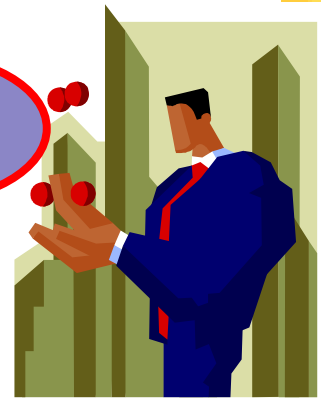
Mechanics Are Us
Buyer

Order

Conformation

Shipped

Web Service



Acme Industries
Seller

Web Service

Status

Physical
Delivery

Web Service

Ship Req

Shipped

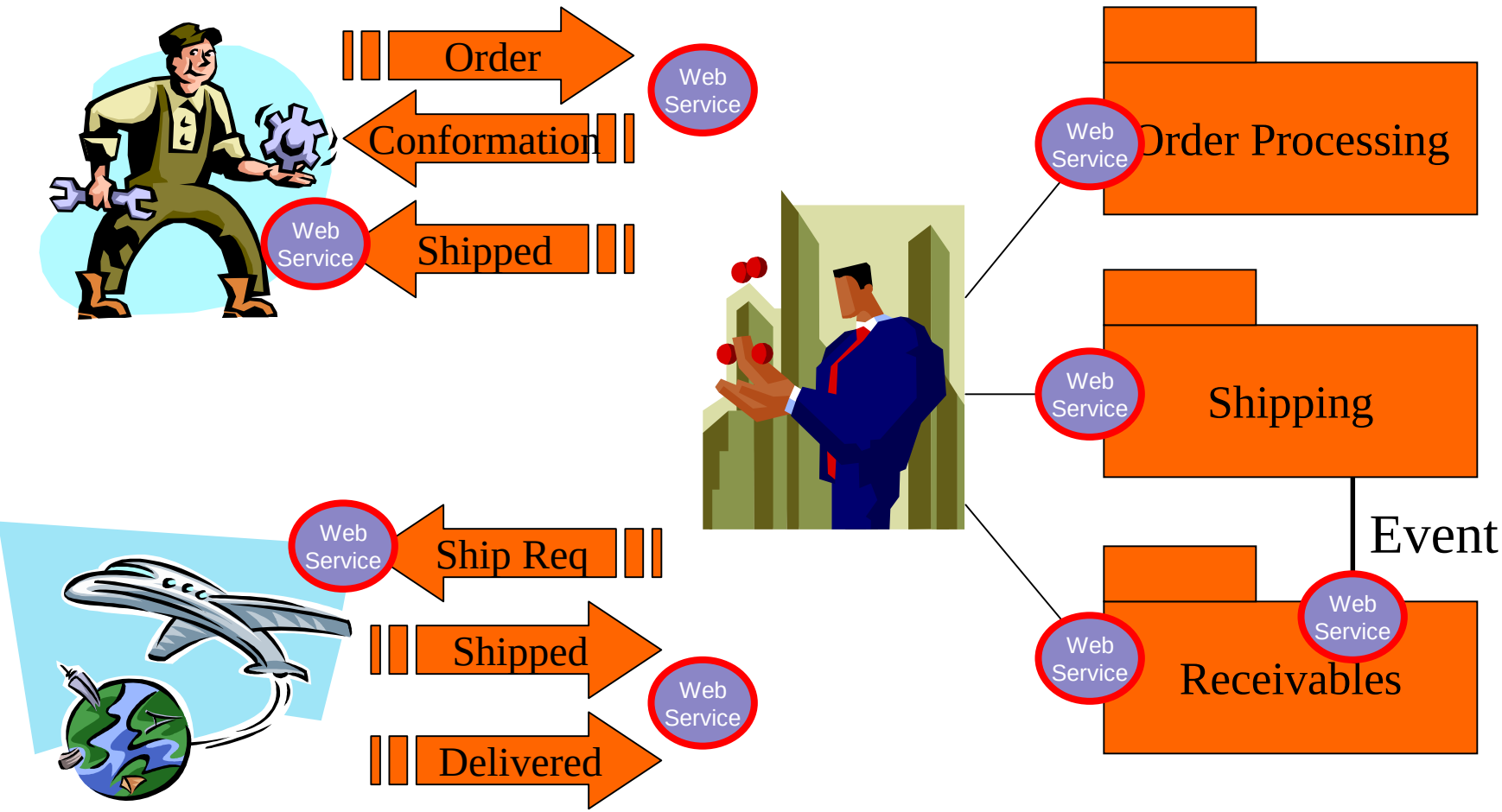
Delivered

Web Service

GetItThere Freight
Shipper

Copyright © 2000-2002, Data Access Technologies, Inc.

Inside the Seller



Copyright © 2000-2002, Data Access Technologies, Inc.

Technical Standards for SOA

EDOC-ECA

XML

J2EE

CORBA

WSDL

SOAP

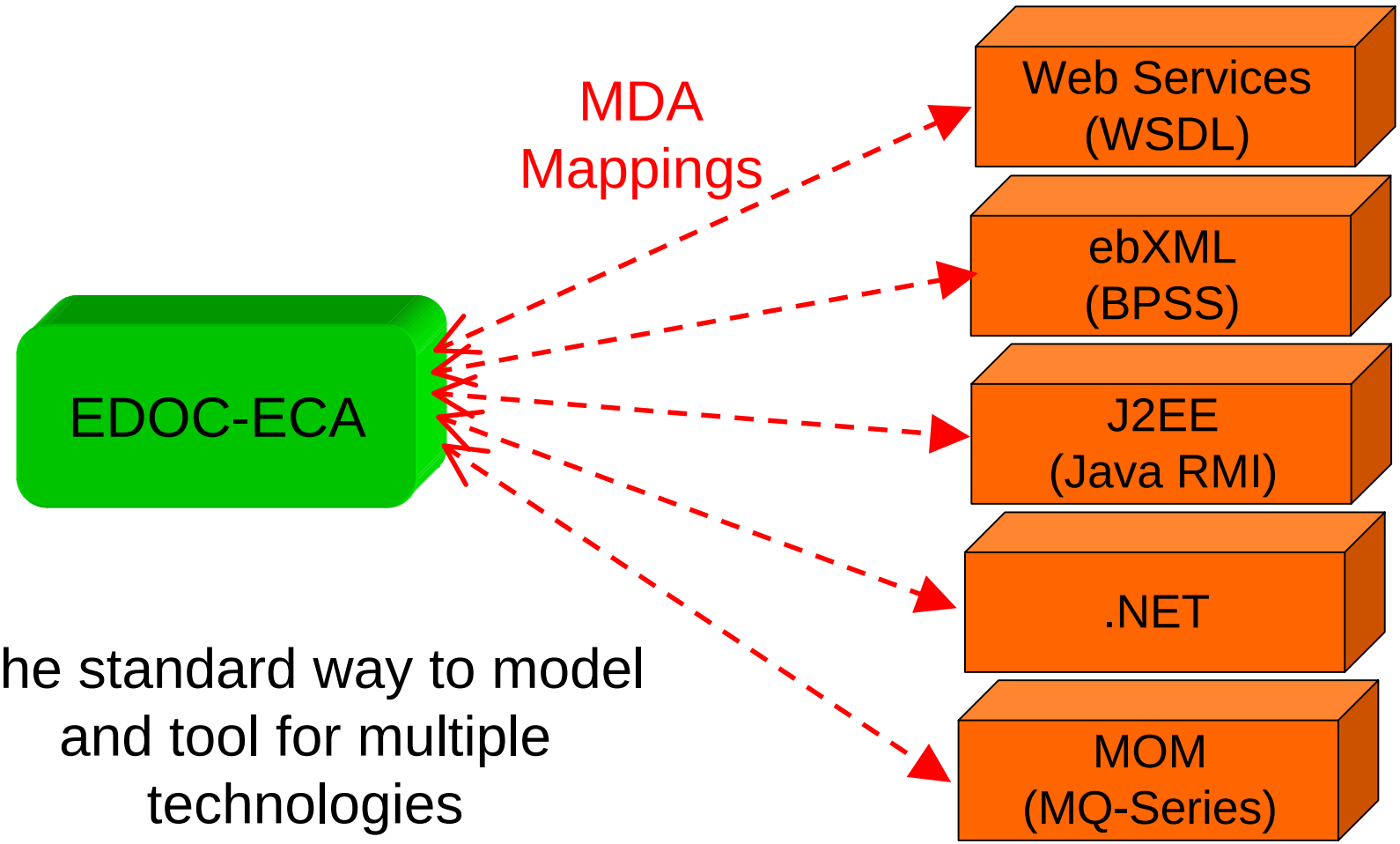
.NET

BPML

XML-Schema

XLANG

ECA as the normal form



The standard way to model and tool for multiple technologies

Copyright © 2000-2002, Data Access Technologies, Inc.

An ECA Methodology

A simple methodology for creating collaborative bueiness processes

Basic Steps

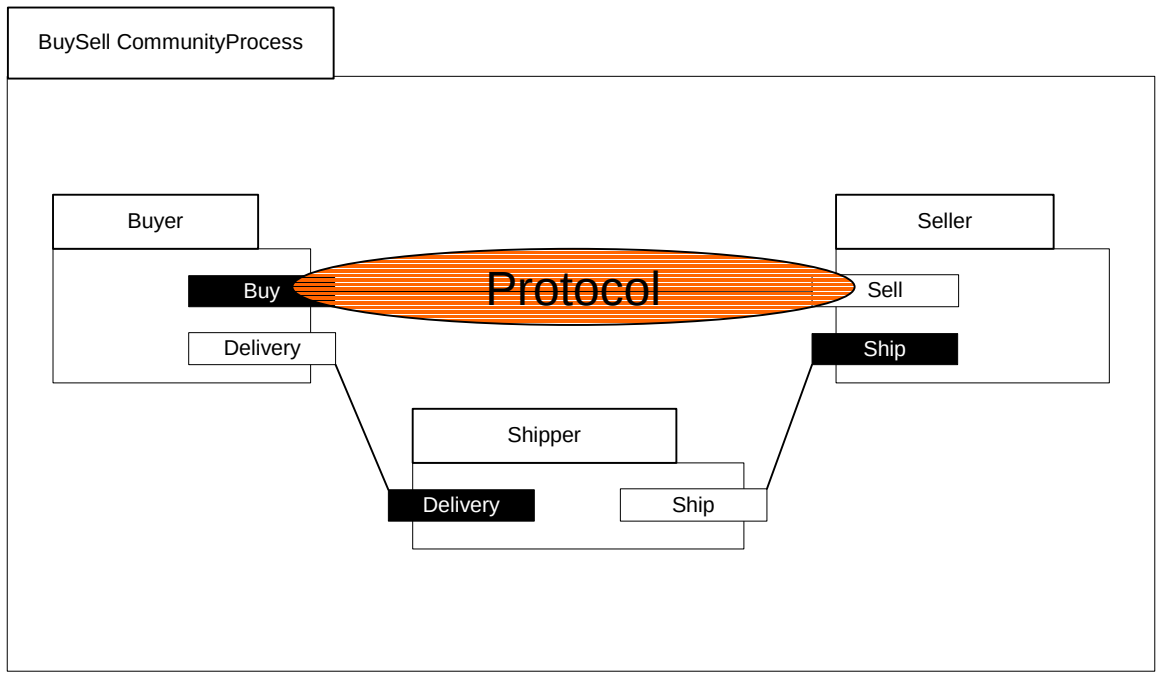
- Identify roles and organize roles into collaborations
- Define collaboration documents
- Create basic business transactions
- Organize into protocols and events
- Use protocols to define ports on roles
- Drill-down into role detail
- Implement roles
- Configure implementations for deployment with technology specifics
- Deploy

Copyright © 2000-2002, Data Access Technologies, Inc.

Components collaborate in processes

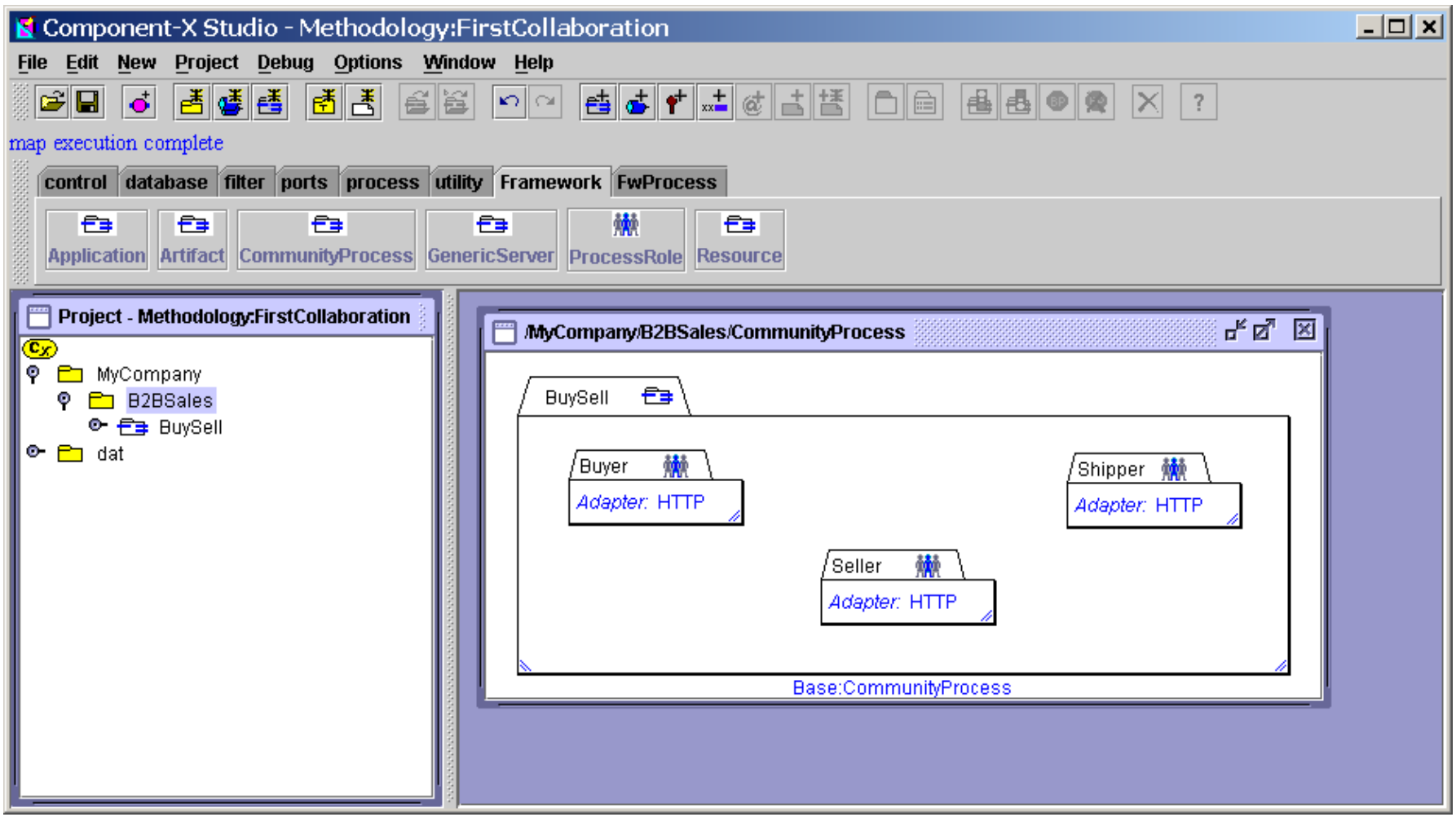
- Identify a “community process”, the roles and interactions in a collaboration

Models helps organize and define the set of services required for enterprise collaboration and simulation



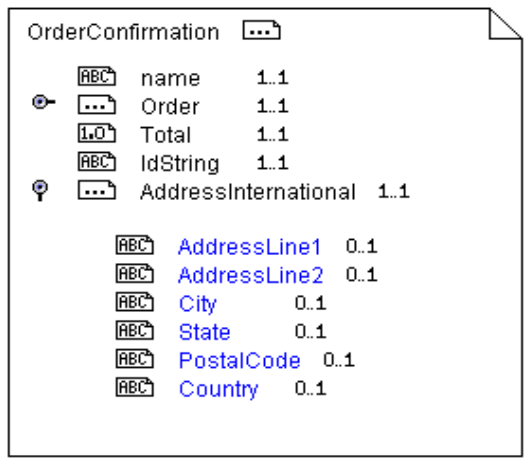
Copyright © 2000-2002, Data Access Technologies, Inc.

Identifying roles and collaborations



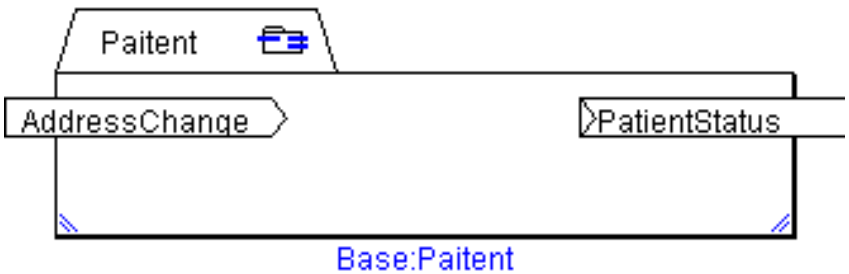
Copyright © 2000-2002, Data Access Technologies, Inc.

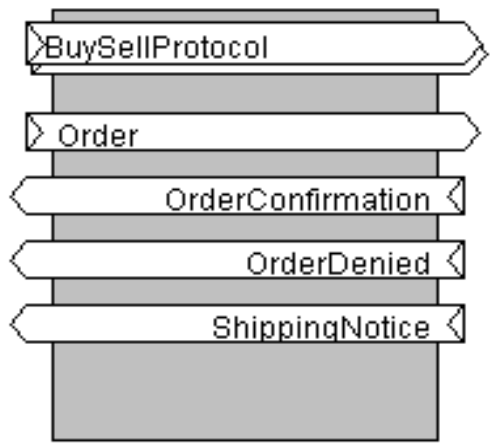
Identify Documents



Copyright © 2000-2002, Data Access Technologies, Inc.

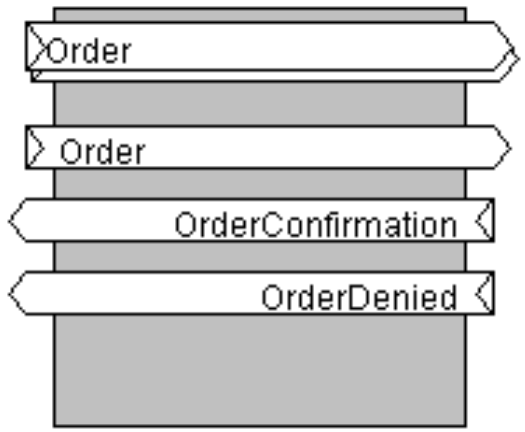
Distinguish protocols and events





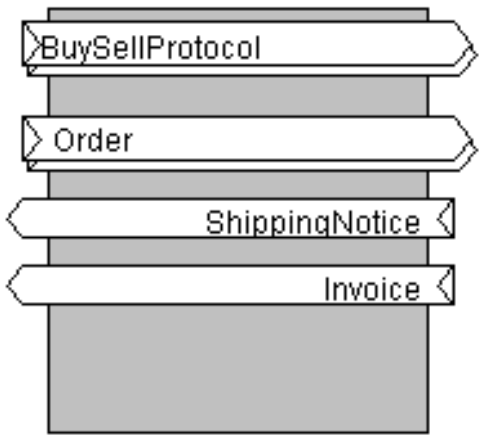
Copyright © 2000-2002, Data Access Technologies, Inc.

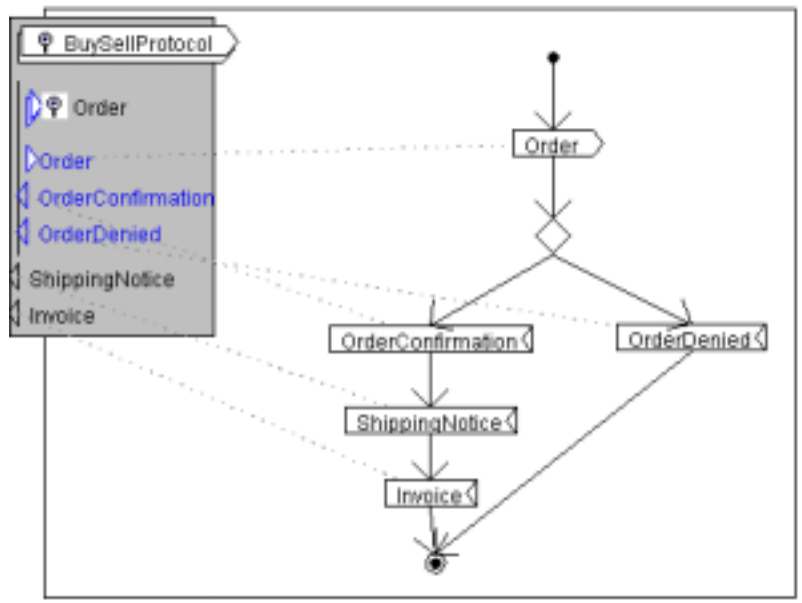
Create Business Transactions



Copyright © 2000-2002, Data Access Technologies, Inc.

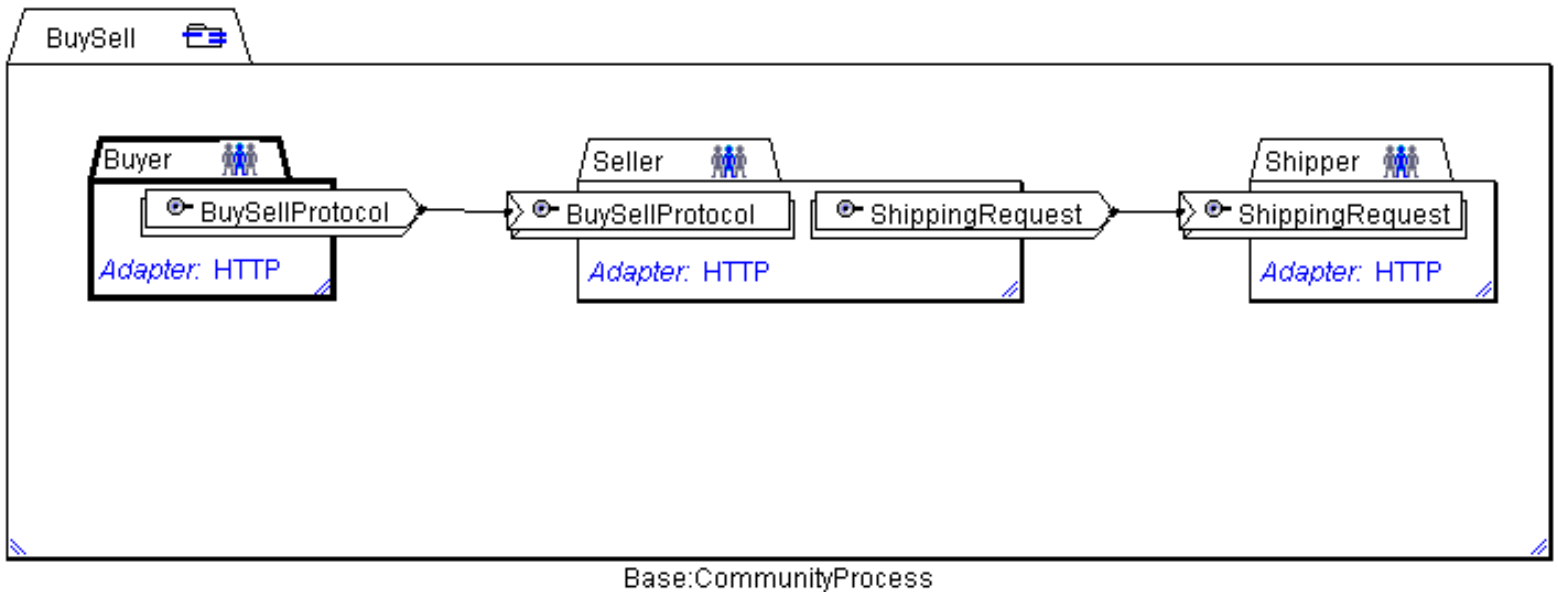
Organize into protocols





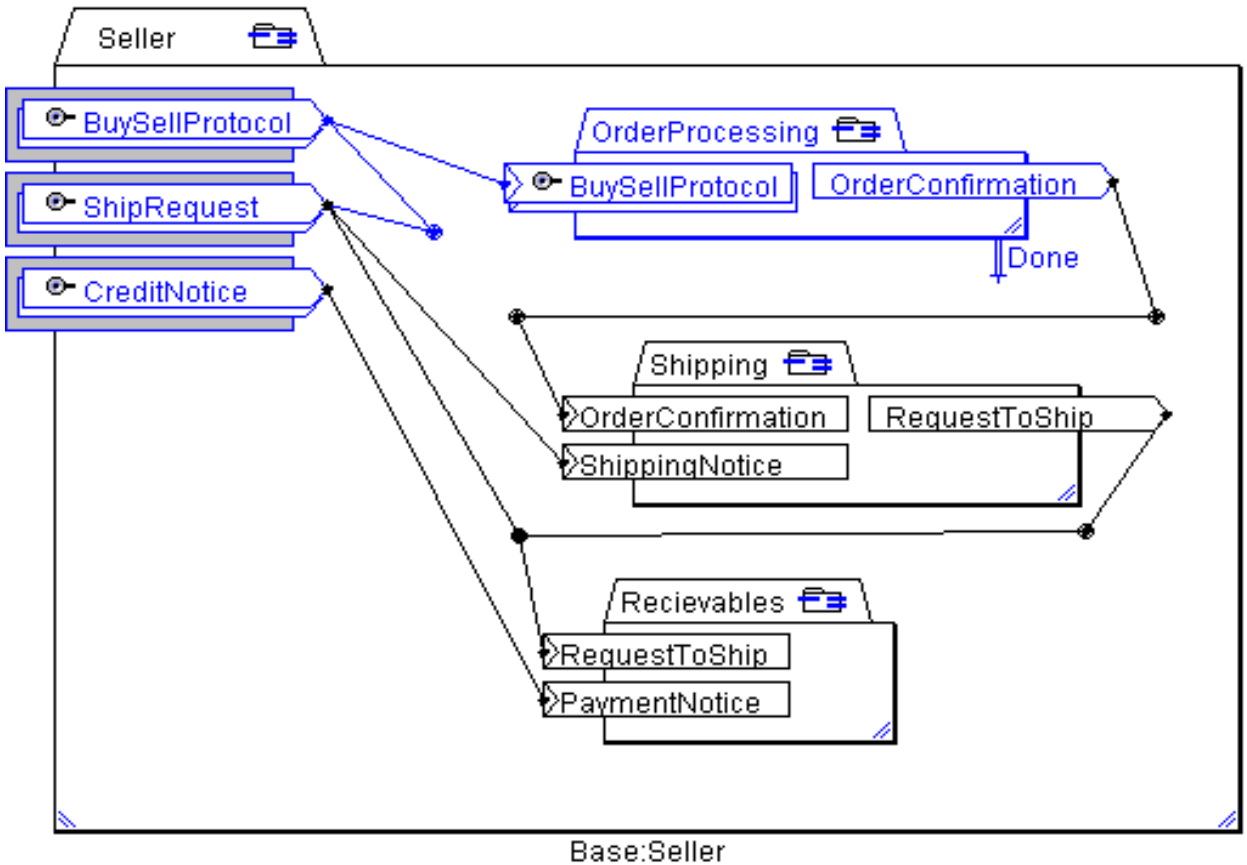
Copyright © 2000-2002, Data Access Technologies, Inc.

Add ports to complete community process



Copyright © 2000-2002, Data Access Technologies, Inc.

Drill-down



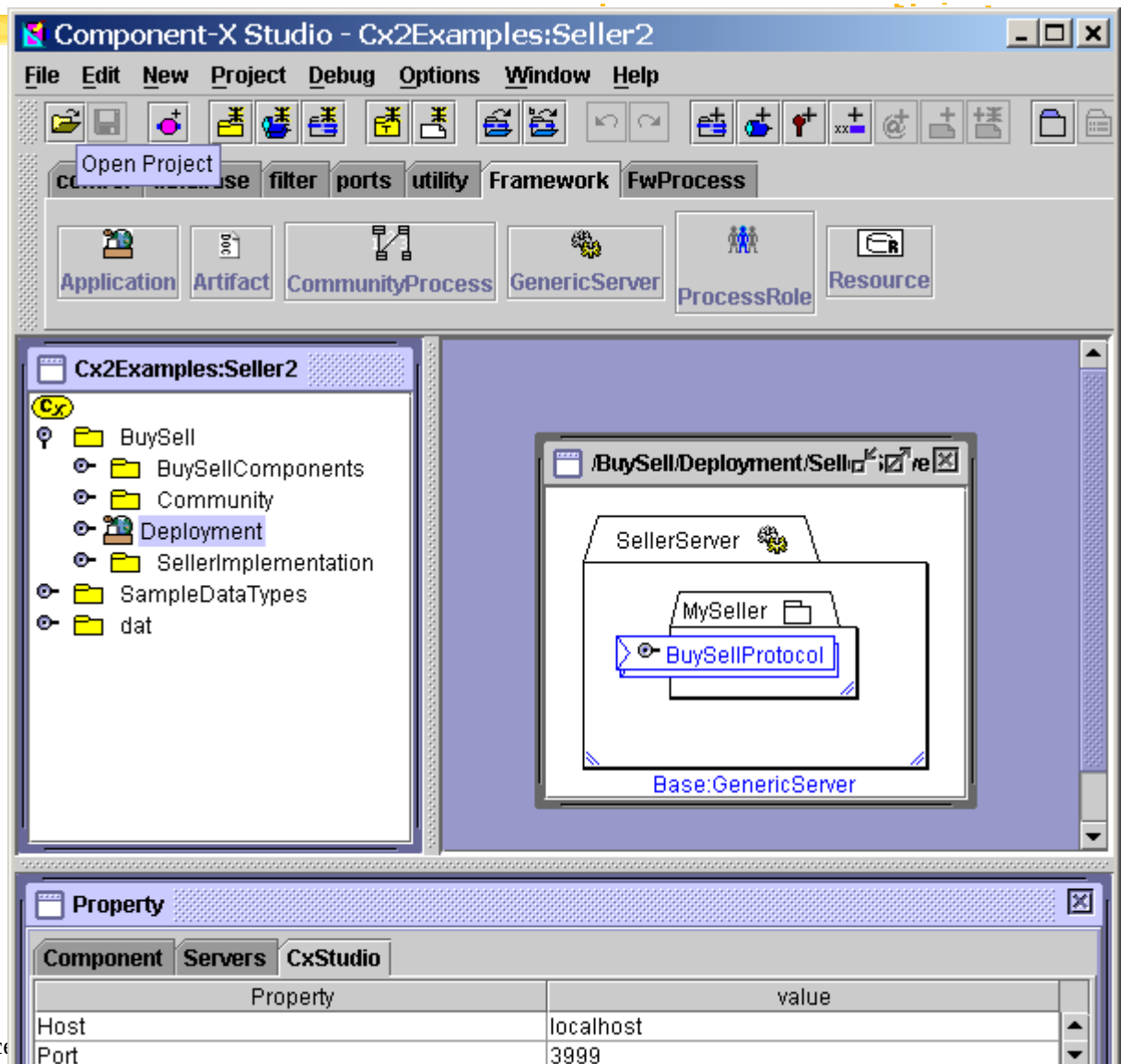
Copyright © 2000-2002, Data Access Technologies, Inc.

Add implementation

- As component compositions
- In a programming language
- By using an external service
- By Wrapping legacy systems

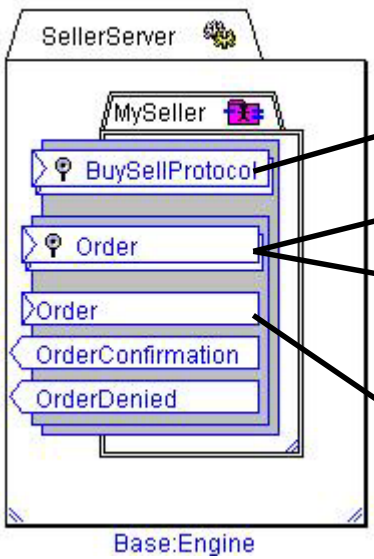
Copyright © 2000-2002, Data Access Technologies, Inc.

Add technology specifics for deployment



Copyright © 2000-2002, Data Acc

WSDL Mapping

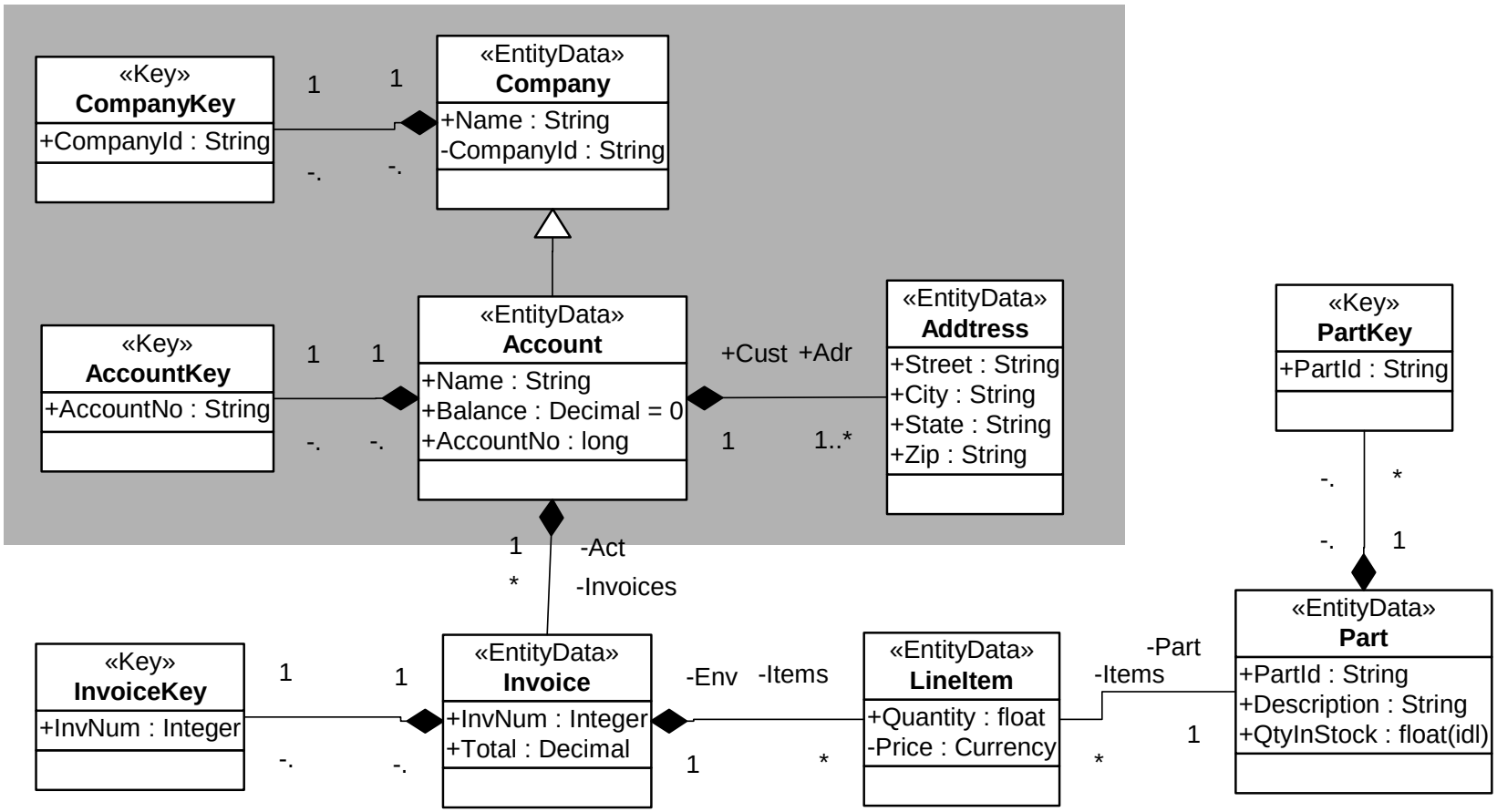


Aspects
WSDL
WSDL-SOAP

```
<binding name="BuySellProtocol"
 type="tns:BuySellProtocol">
<soap:binding
      transport="http://schemas.xmlsoap.org/soap/h
      style="rpc" />
<operation name="Order">
<soap:operation
      soapAction="urn:/BuySell/Community/BuySellP
      col/Order" style="rpc" />
<input name="Order">
<soap:body use="encoded" namespace="urn:SellerServ
      encodingStyle="http://schemas.xmlsoap.org/so
      encoding/" />
```

Copyright © 2000-2002, Data Access Technologies, Inc.

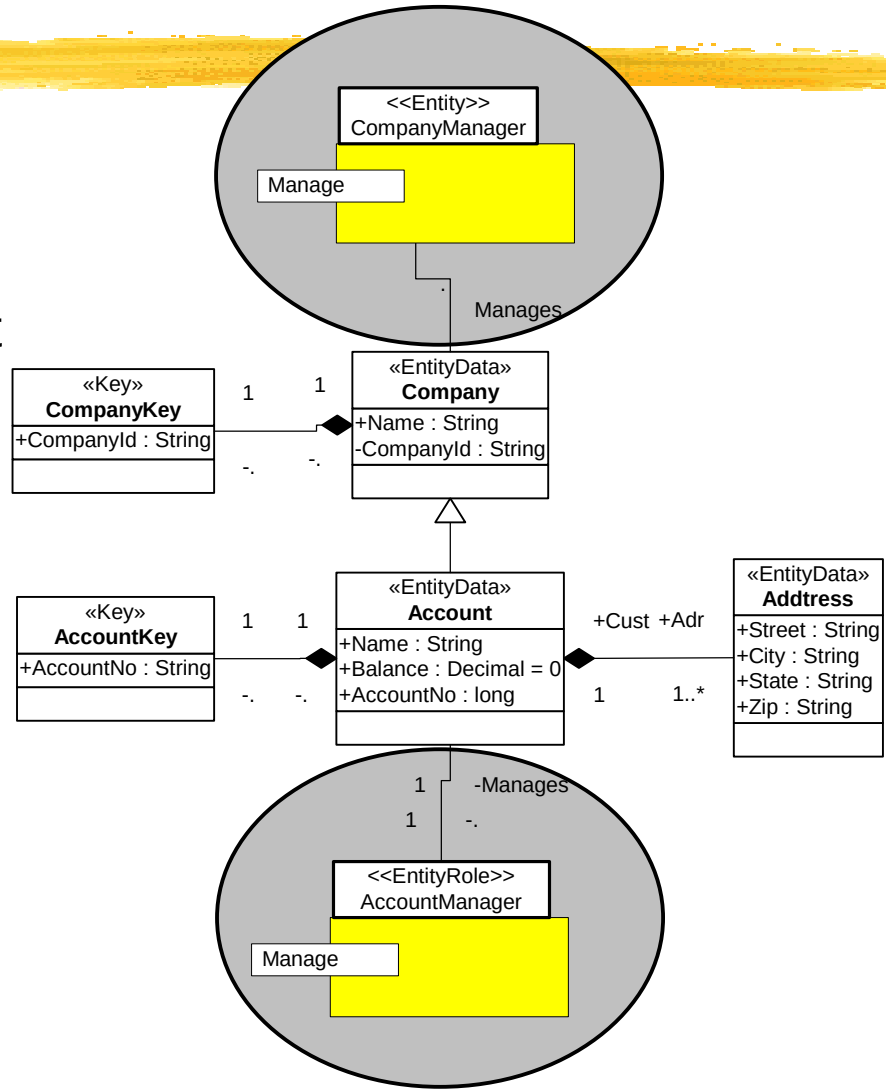
Sample Information Model



Copyright © 2000-2002, Data Access Technologies, Inc.

Adding Entities

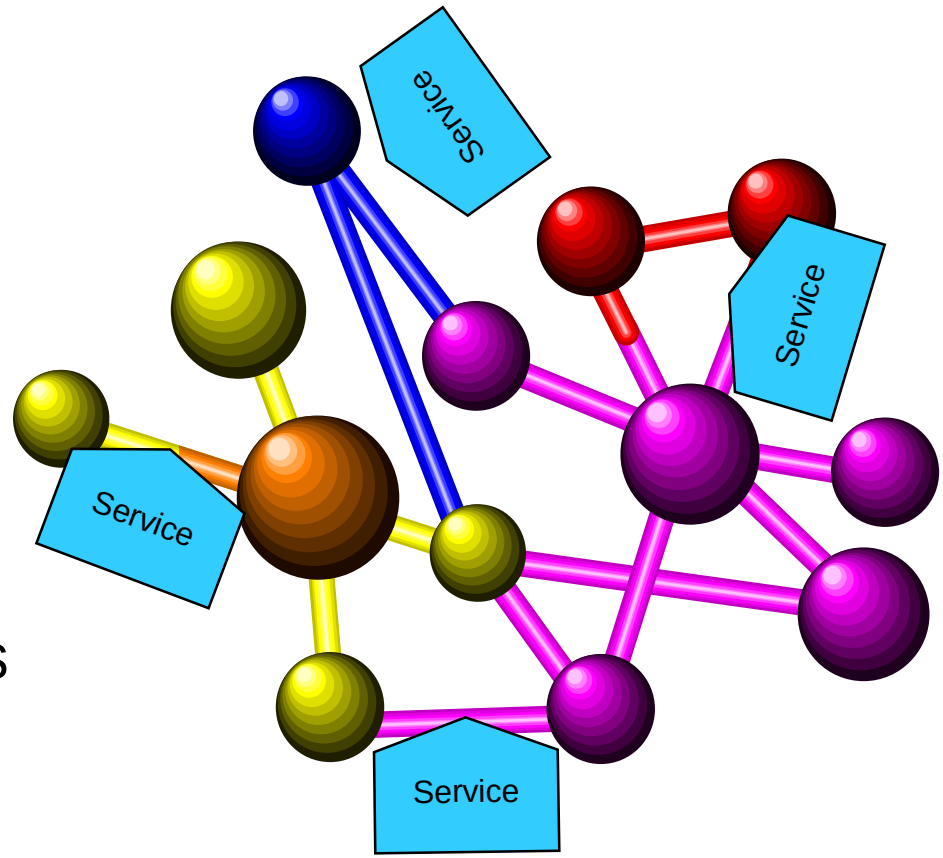
- Entities are added to manage entity data
- Entity Roles are managers that provides a view of the same identity in another context
- The Entities have ports for managing and accessing the entities
- Non-entities which are owned by (aggregate into) an entity are managed by the entity



Copyright © 2000-2002, Data Access Technologies, Inc.

Enterprise Components in SOA

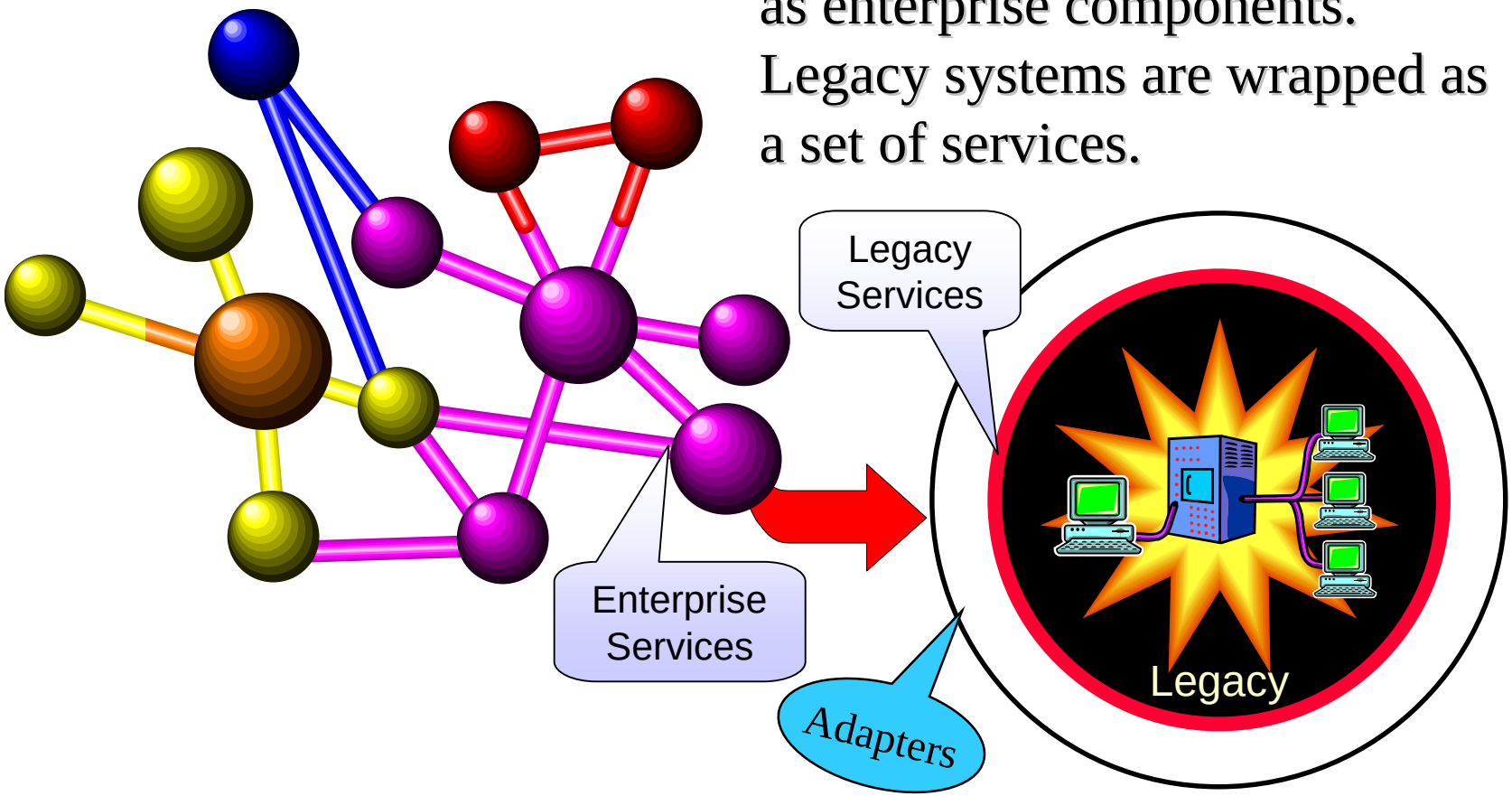
- Enterprise Components must be independent & loosely coupled
- While being able to interoperate with each other using services
- Making the information system a lattice of cooperating components
- Simulated or real



Copyright © 2000-2002, Data Access Technologies, Inc.

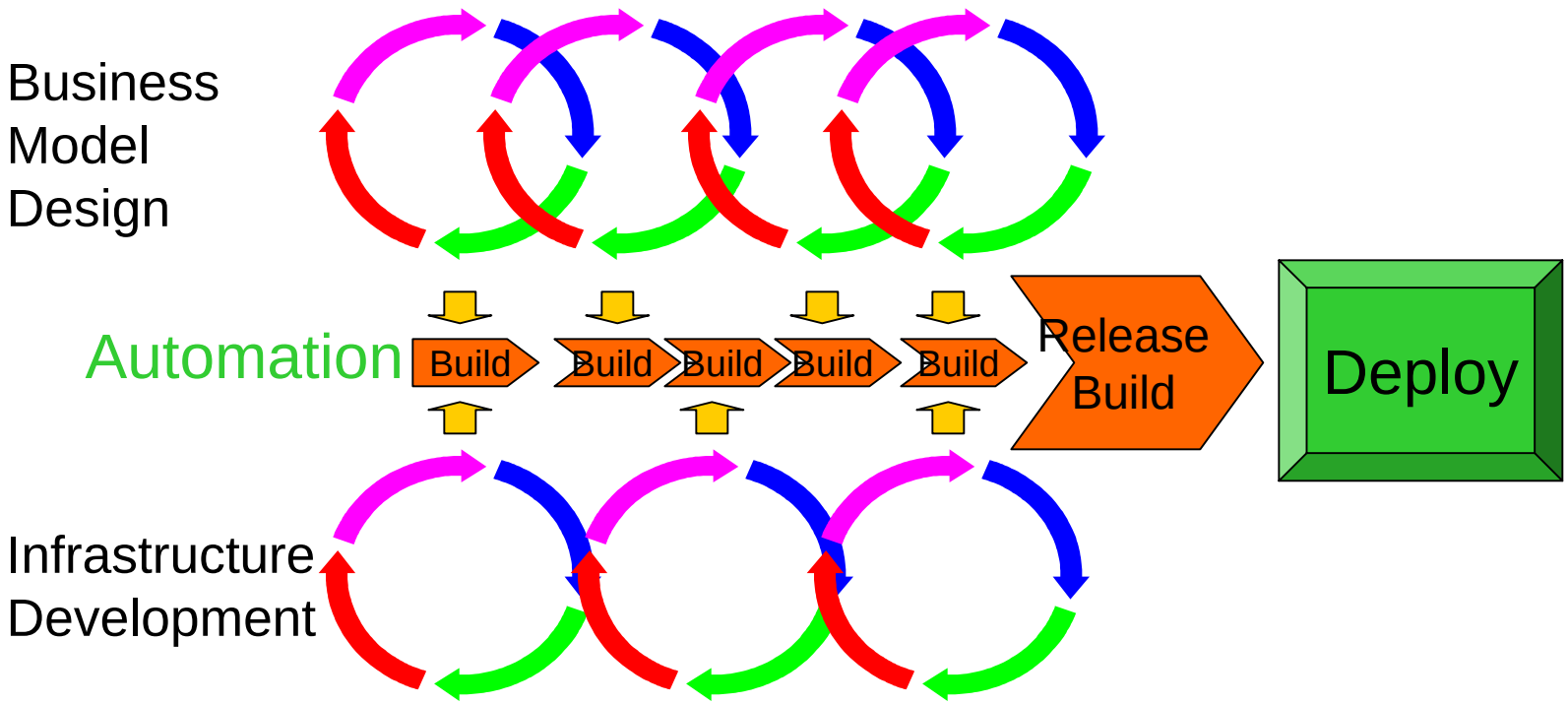
Legacy “Wrapping”

Wrapping allows existing programs and data to work with and work as enterprise components. Legacy systems are wrapped as a set of services.



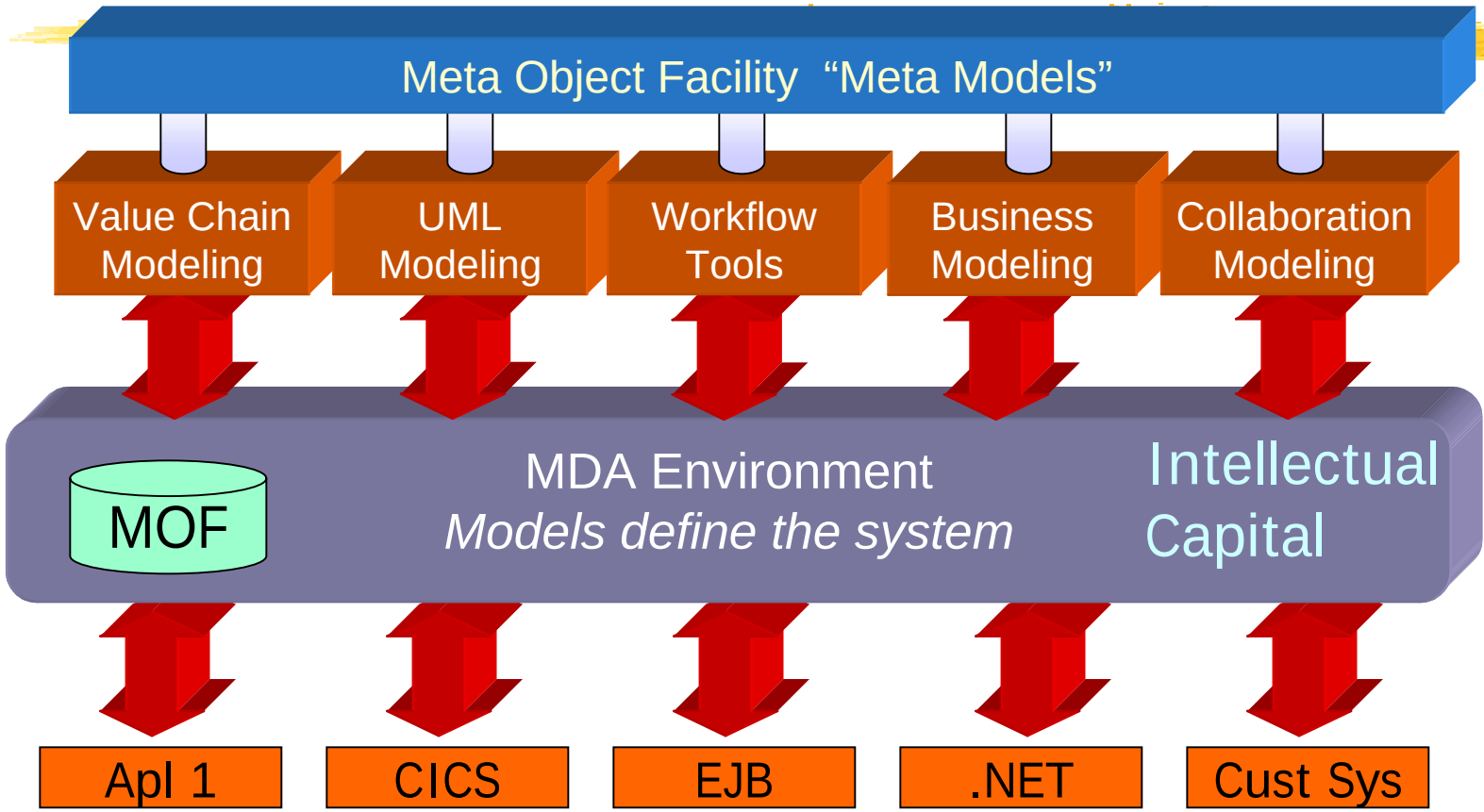
Copyright © 2000-2002, Data Access Technologies, Inc.

Iterative Development



Copyright © 2000-2002, Data Access Technologies, Inc.

Common Environment for Intellectual Capital



Integration of infrastructure

Copyright © 2000-2002, Data Access Technologies, Inc.

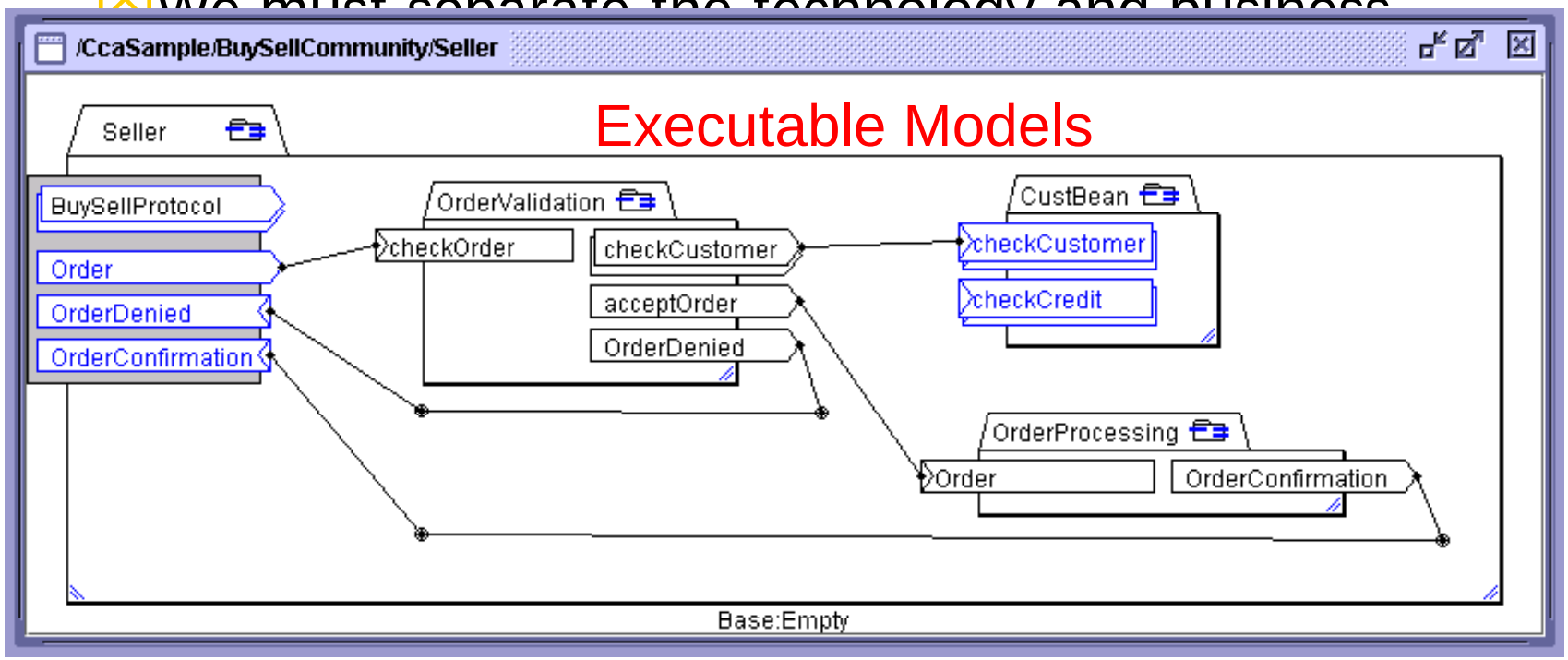
High level tooling & infrastructure

- MUST BE SIMPLE!
  - We must be able to create better applications faster
  - We must separate the technology and business concerns, enable the user
- Tooling + Infrastructure
  - Executable models are source code
  - Tooling must be technology aware
  - Infrastructure must support tooling, not manual techniques
- Model based component architectures

Copyright © 2000-2002, Data Access Technologies, Inc.

High level tooling & infrastructure

- MUST BE SIMPLE!
  - We must be able to create better applications faster
  - We must separate the technology and business



Copyright © 2000-2002, Data Access Technologies, Inc.

Net effect

- Using these open standards and automated techniques we can;
  - 80% Reduction in complexity (Conservative)
  - Achieve the strategic advantage of an open and flexible enterprise
  - Produce and/or integrate these systems FASTER and CHEAPER than could be done with legacy techniques
  - Provide a lasting software asset that will outlive the technology of the day

Copyright © 2000-2002, Data Access Technologies, Inc.

Sample Applications

- Executable Enterprise Architecture for the General Services Administration – Federal Supply Service
- Enterprise Component Architecture for U.S. Army PEO-STRI
- Intelligence application for Raytheon & DARPA
- Collaboration Architecture for Kaiser Permanente

Copyright © 2000-2002, Data Access Technologies, Inc.

Contact

Cory Casanave

Data Access Technologies

www.enterprise-component.com

cory-c@EnterpriseComponent.com

(305) 234-7077

Copyright © 2000-2002, Data Access Technologies, Inc.