



# Business Objects & Business Engineering

Synchronizing Business & Systems



Open Engineering Inc.

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## About This Session

- Produced & Delivered by...

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- Presented by...

***Robert E. Shelton***, President & CEO

- Presented to...

***DB Expo SF 1997***

# Road Map



- Business engineering
- Objects -- *How my usage differs...*
- Business objects -- *Business components*
- Business engineering -- *Framework & approach*
- Business patterns -- *Foundation for engineering*
- Organization issues -- *Taking the next step*



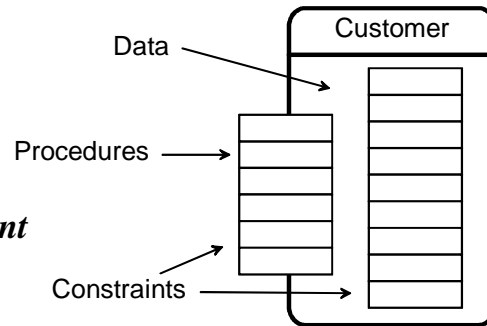
## BUSINESS OBJECTS

### *Componentization of Business*



# What is an Object?

- **Package** of data, procedures and constraints about one concept in
  - business world
  - computer environment
- A **module defined around a domain concept** instead of coding structures
  - We use objects in modeling, analysis, design and software
- An object is a **well-defined component**

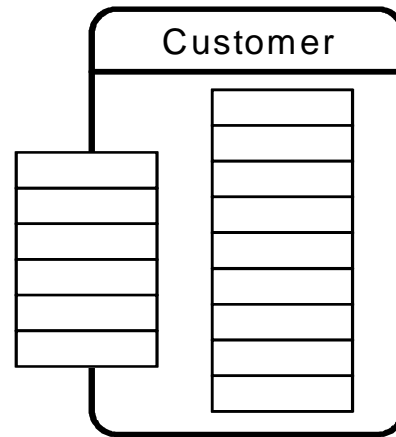


# Types of Objects

- All objects are not created equal
  - Different object types address different issues
  - Process and management issues differ
  - Buy vs. build decision driven by different motivations
- There are **3 types of objects**:
  - **Business** - business concepts / components, sharable across company or industries, independent of applications
  - **Application** - adapted presentation layer components, user interfaces to business objects
  - **Technology** - software and infrastructure building blocks, frameworks for software development

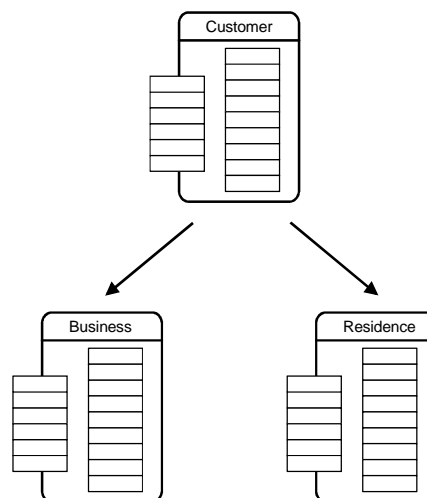
# What is a Business Object

- A business modeling or software ***component of business procedure, policy & rules wrapped around data***
  - Each business object represents a single narrowly-defined business concept -- customer, order
- A way to organize the ***right data and right procedure in the right place***
- ***Independent of applications***
- ***Sharable*** (i.e. business-reusable)



# Why Business Objects?

- ***Systems mirror the business***
  - Seamless integration of existing applications, wrapping
- ***Internal & external sharing***
  - Business data & procedures
  - Business rules & integrity constraints
- ***Managing differences and change in business rules***
  - Put divisional/local business rules in the specializations
  - Maintain corporate definitions, rules and data in the generalization



# Types of Business Objects

- There are **3 types** of business objects...

- **Entity Business Object**

- Person, place, thing or concept
- Business noun



- **Process Business Object**

- Business process, workflow, activities
- Business verb that require multiple nouns
- Structured collection of entities, interactions, events



- **Event Business Object**

- An event that causes or results from processes or actions
- Occurrences, interruptions, passage of time

# Common Entity Objects

- Customer
- Order
- Product
- Contract
- Equipment
- Capacity
- Address
- Vehicle
- Facility
- Resource



# Common Process Objects

## Major Processes

- Order Fulfillment
- Procurement
- Production
- Billing



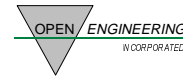
## Common Sub-Processes

- Quotation, Contracting, Ordering, Delivery
- Vendor Certification, Ordering, Receiving
- Invoicing, Collections

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# Common Event Objects

- Inventory Low
- Tank Overpressure
- Employee Absent
- Approval Granted
- Interest Rate Change
- Payment Cleared
- Fiscal-year End
- Loan Due
- Bill Payable
- Gate Closed
- Order Placed



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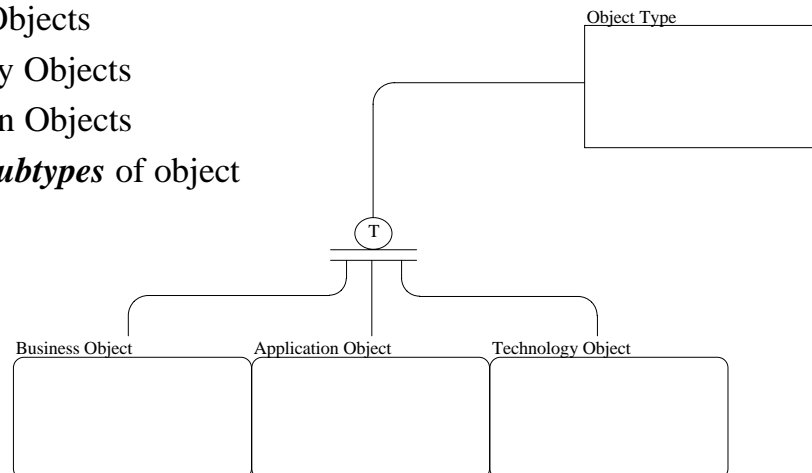


# Summary of Taxonomy

- This discussion has established a 2-level taxonomy for organizing our thinking about objects:
  - 3 Meta-Subtypes of Objects
  - 3 Meta-Subtypes of Bus Object

## 3 Meta-Subtypes of Objects

- Expressed as an type diagram...
  - Business Objects
  - Technology Objects
  - Application Objects
- Are *abstract subtypes* of object



## 3 Meta-Subtypes of Bus Object

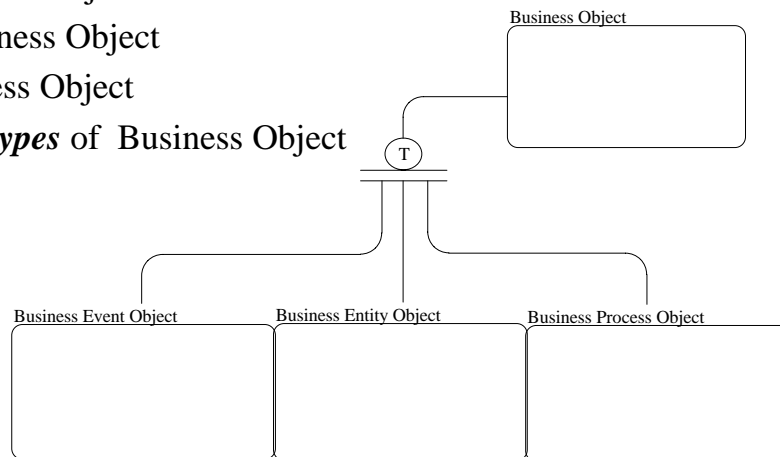
- Expressed as an type diagram...

Entity Business Object

Process Business Object

Event Business Object


are ***abstract subtypes*** of Business Object



## Importance of Taxonomy


- With this taxonomy we can ***separate***
    - Business from technology
    - Business from applications
    - Applications from technology
  - And we can ***translate*** a business person's view of
    - Processes
    - People, places, things, resources, concepts
    - Events
- ...into objects and software components





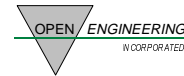
# BUSINESS ENGINEERING

## *Framework & Approach*



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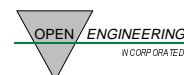
## What is Business Engineering?



- Business engineering combines:
  - ***Business Process Re-engineering*** (BPR)
  - ***Continuous Improvement*** (TQM)
  - ***Business objects***
- Business engineering integrates:
  - Business definition and change management
  - Information systems delivery
- Business engineering is about ***synchronizing information systems with the business***
  - And maintaining synchronization when both business and technology change constantly

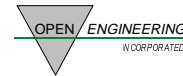
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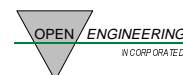
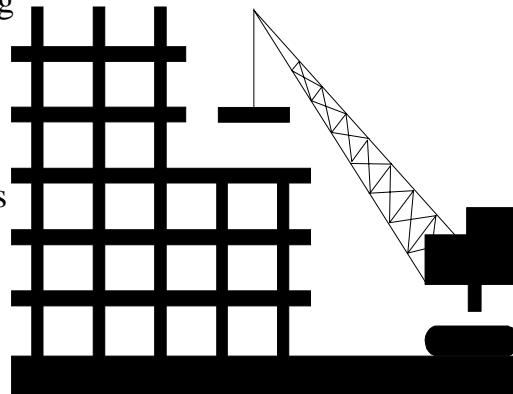
# OOBE is Business Engineering

- OOBE is a reference model and discipline for...
  - Business engineering -- component definition
  - Flexible software manufacturing -- component delivery
- OOBE is unique because it...
  - Focuses on business first
  - Synchronizes business and information systems change
  - Bases business engineering on business patterns
  - Causes business object re-use by focusing on commonality
  - Aligns IS processes with business processes
  - Is based on business objects

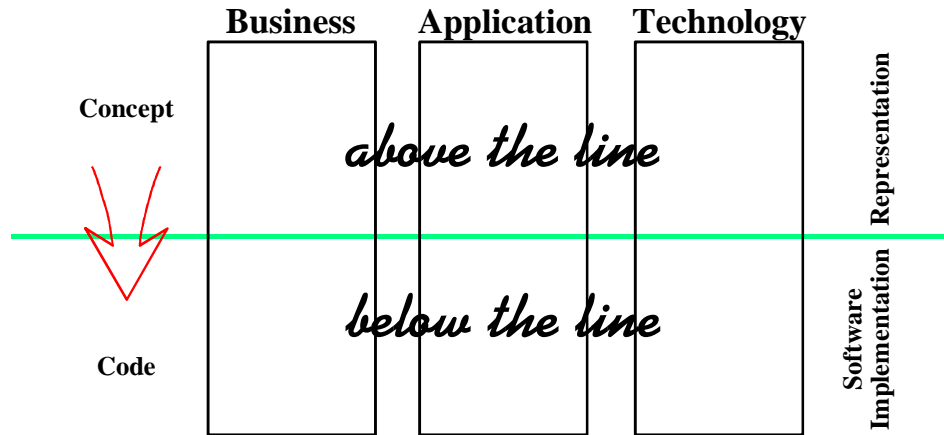


## Why a Reference Framework?

- **Structure** for...
  - Managing business engineering
  - Restructuring IS around core business processes
- **Basis** for...
  - Selecting models and diagrams
  - Designing a repository
  - Selecting modeling tools
- The reference framework tells us:
  - What we should do and why
  - How one task drives the next

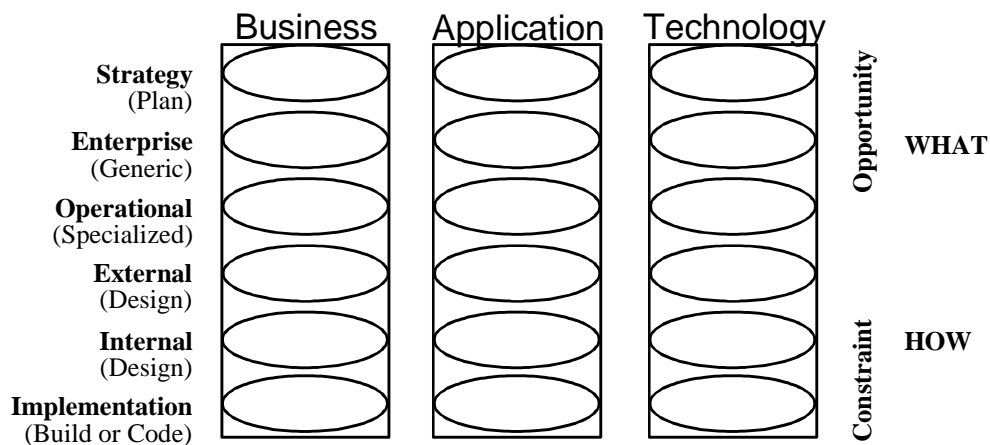


# Start with 3 Types of Objects...



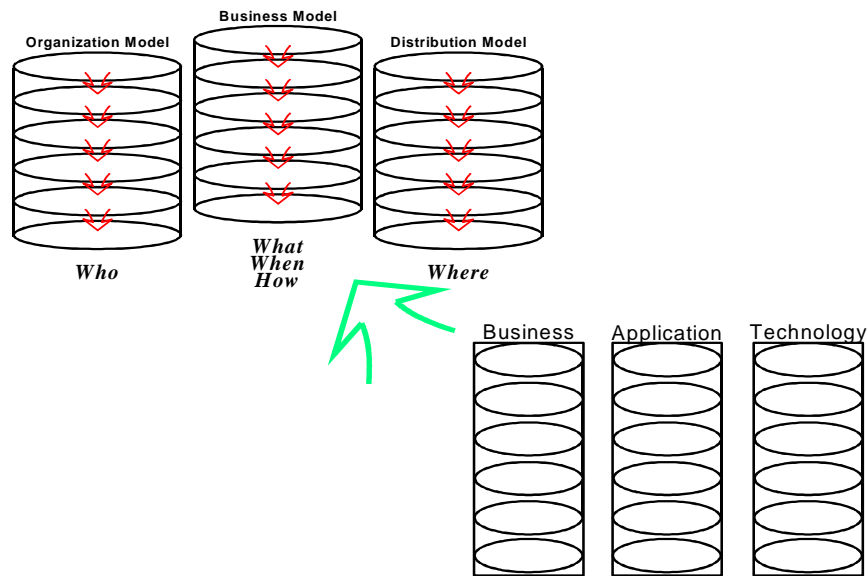
Goal: Establish a *unifying framework* for Information Systems

# Partition the Dimensions...



(Reference model: Sowa & Zachman's Information Systems Architecture)

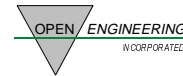
# Expand the Business Column



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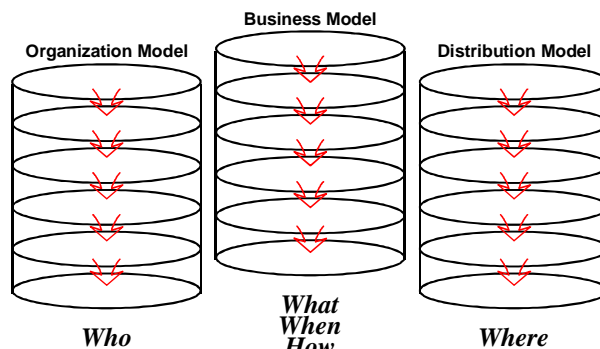
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# To Engineer Process & Workflow

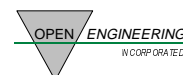
- Distribution Core Model
  - Where - locations, routes
- Business Core Model
  - What - central concepts, relationships, types
  - When - events, timing
  - How - processes, interactions
- Organization Core Model
  - Who - people, roles, organization structure



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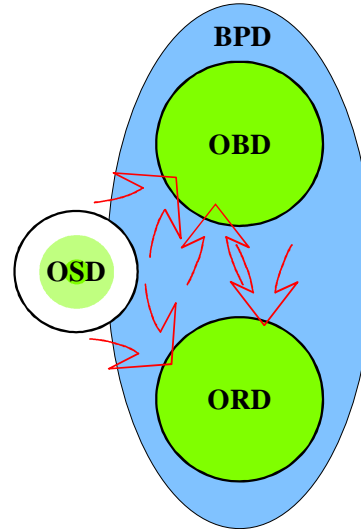
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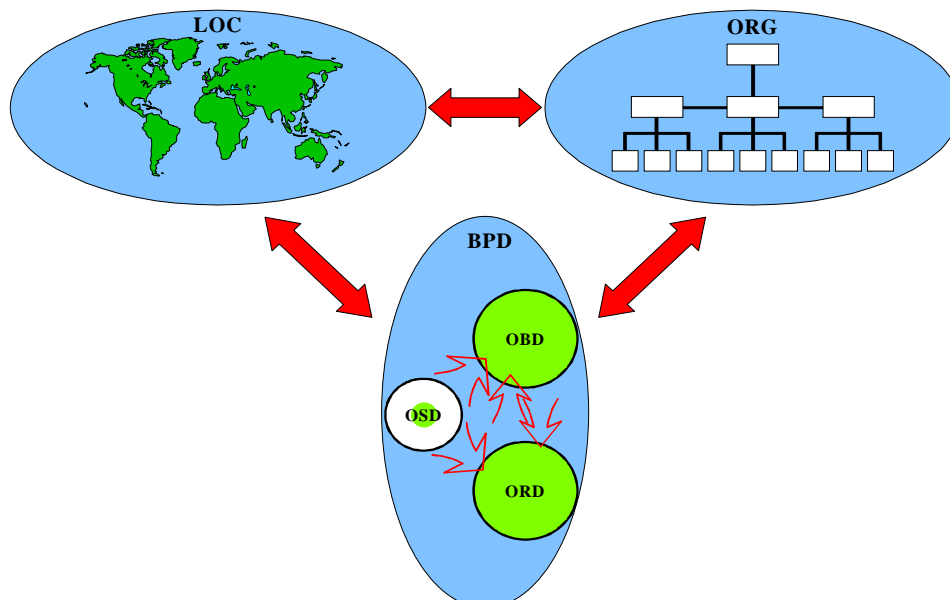


# From an Integrated Perspective

- **Business Process Diagram (BPD)**
  - High-level processes, sub-processes
- **Object Behavior Diagram (OBD)**
  - Process & Interaction
  - Business Events
- **Object Relationship Diagram (ORD)**
  - Structure
  - Types and Roles
  - Binary Relationships
- **Object State Diagram (OSD)**
  - Lifecycle



# Working with the Big Picture

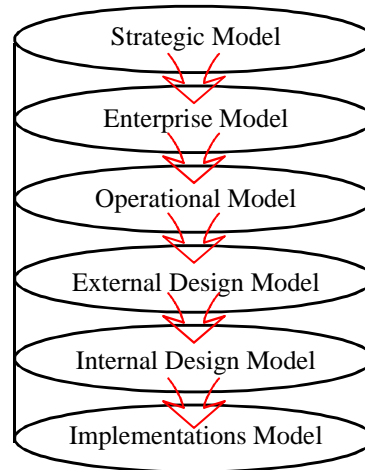


# Transform BPR into Objects

## Business Logical/Analysis Models

- Strategic Model
  - Vision, goals, objectives
- Enterprise Model
  - Industry generic
  - Best-of-Class
  - Non-unique business processes
- Operational Model
  - Company specific
  - Competitive advantage

## Business Core Model

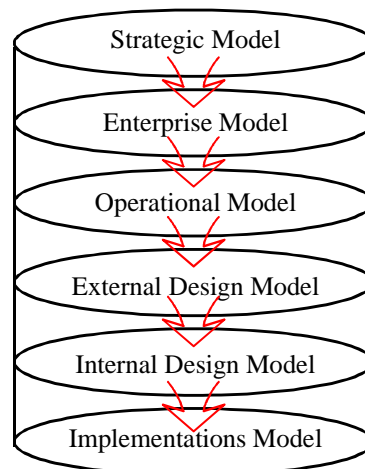


# Transform Business into Software

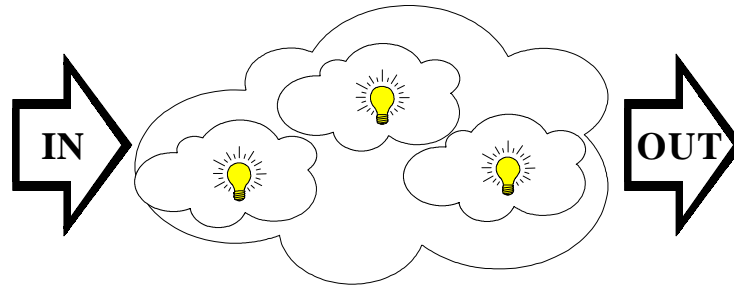
## Business Physical/Design Models

- External Model
  - External interface (API)
  - Environment specific
- Internal Model
  - Insides of object classes
  - Legacy integration, mapping
  - Methods, data structures
- Implementation
  - Server program code

## Business Core Model



# OOBE: Just-in-time Engineering

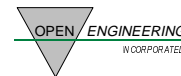


- Capture the business using "business object models"
- Re-design the business for optimal business performance
- Translate business objects into software implementations
- Deliver software business objects as internet servers

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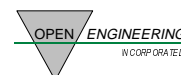
## BUSINESS PATTERNS

### *Engineering Foundation*

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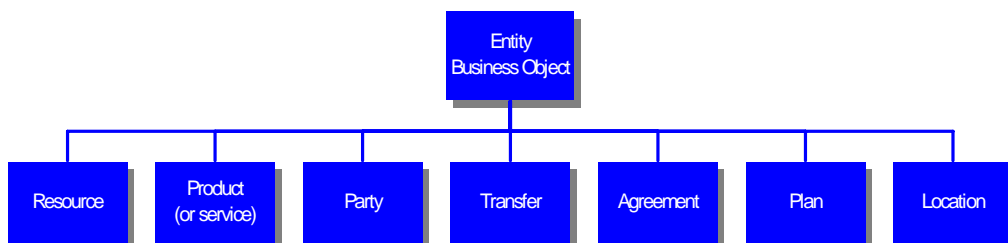
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# Business Patterns

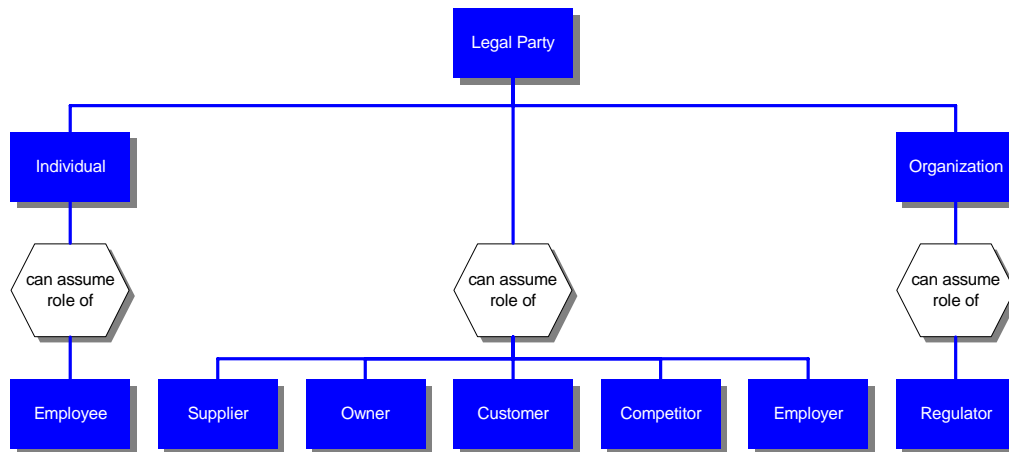
- ***Collections of business objects and associations***
  - ***Prefabricated business sub-assembly***
    - Captures a common/generic business construct
- Different types of business patterns capture...
  - ***Enumeration*** - lists
  - ***Behavioral*** - interaction (workflow) or business processes
  - ***Structural*** - type, role and composition structures
  - ***Semantic*** - binary relationship structures
- ***Patterns are the basis for value chain integration***

## 7 Foundation Entity Objects





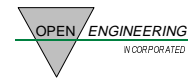
# Legal Party



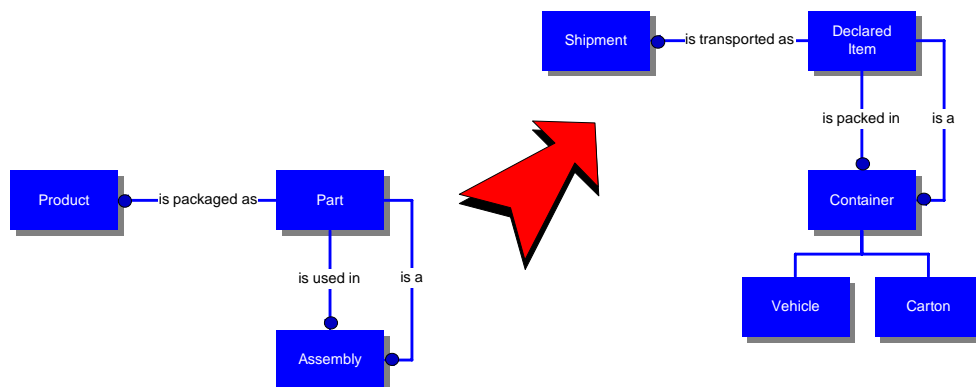
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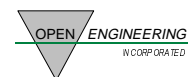
# Bill-of-Materials



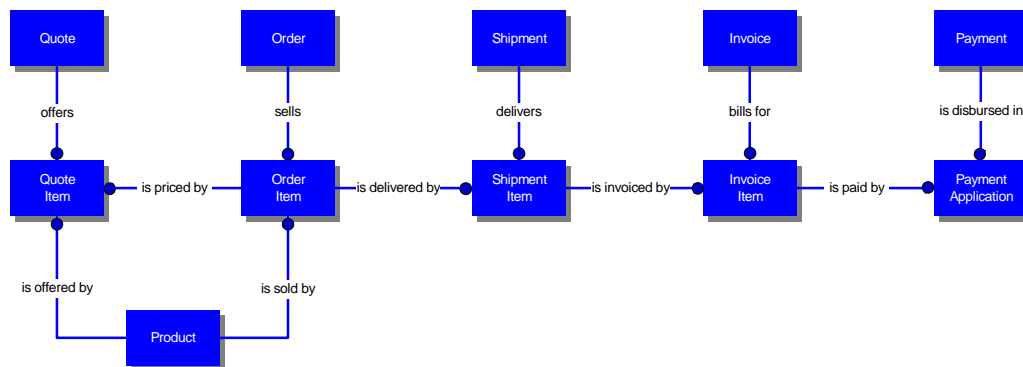
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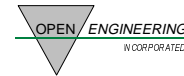
# Double-W (Quote-to-Collect)



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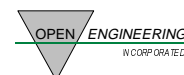
## Why Use Patterns?

- Patterns can be *specialized* to the needs of different businesses
  - Specialization is the basis of business object re-use
  - *Specialization encourages re-use in different areas of the business itself*
- Patterns *eliminate the need for re-invention*
  - Plug-and-play component architectures require patterns to work well for business models and applications
- Patterns *focus BPR on best practices and commonalities* rather than details and differences

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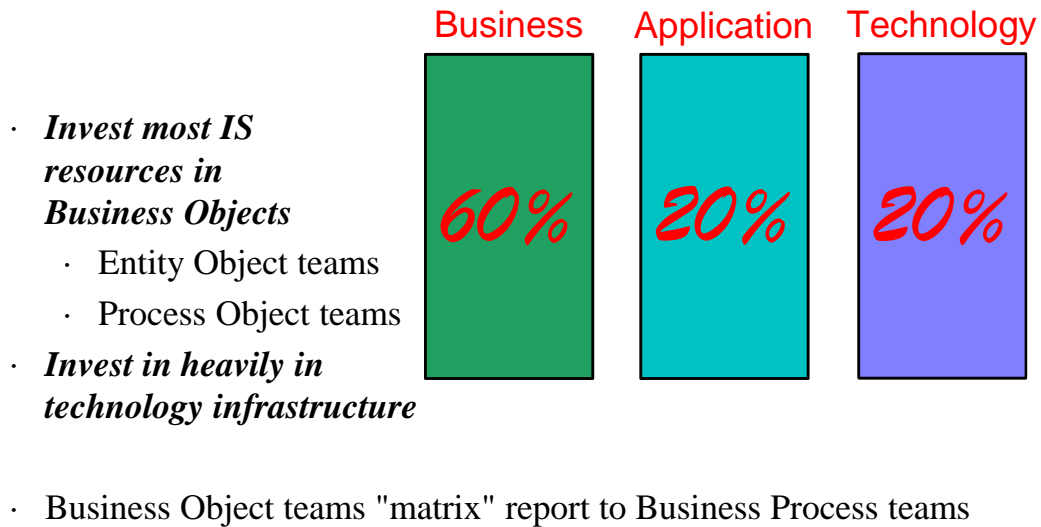


# How to Use Business Patterns

- Business patterns are used as...
  - Base elements of type hierarchy - foundation on which to define specialized types
  - Source of shared definition, behavior, relationships
  - Integration point for different business units views
  - Bootstrap for business modeling, analysis, engineering
  - Benchmark for evaluating "as is" business models

## ORGANIZING *for* *Component Engineering*

# Process-Tuned I.S. Organization



# Scope of the Change



# Parting Thought...

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- Today's manufacturing giants profit from ideas once considered impossible...
  - Interchangeable parts
  - Standard interfaces
  - Flexible manufacturing
  - Mass customization
  - Just-in-time delivery



- ***Business engineering applies these ideas to business through objects and patterns***