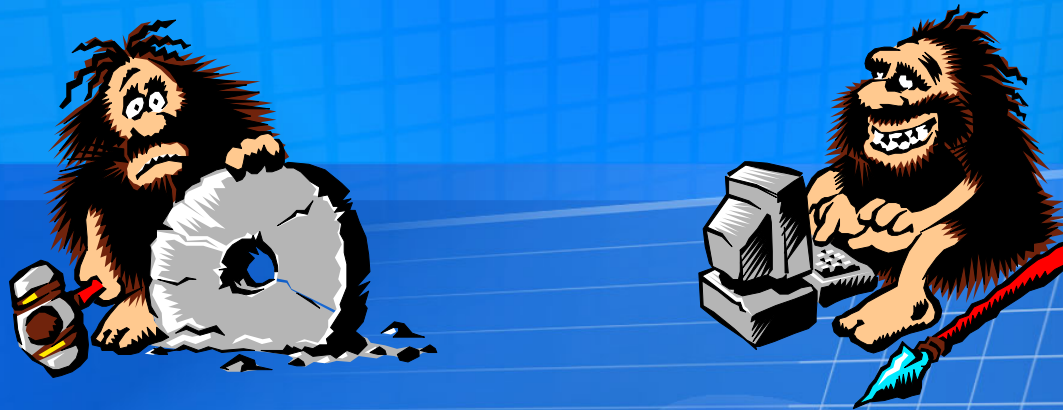


# *Universal Models and Principles in Data Modeling*



*By Len Silverston,  
Universal Data Models, LLC*

# ***Purpose – Facilitate integration***

***Share/practice re-usable data model patterns  
(Roles, Statuses)***

***Share/practice integration principles***

# *Universal Patterns and Universal Data Models*

## *Universal Patterns:*

*Templates and alternatives for common themes  
in data modeling*

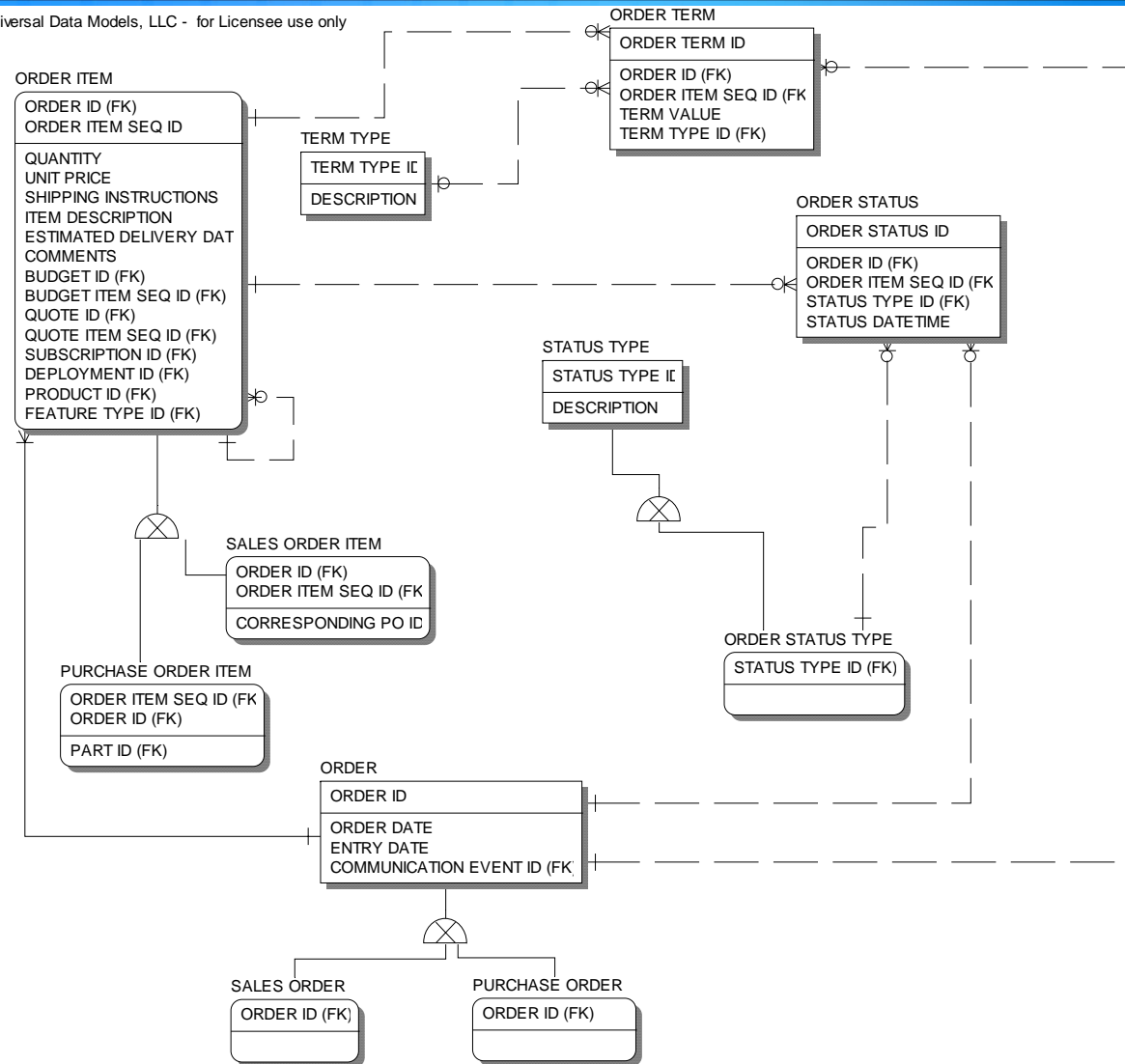
## *Universal Data Models:*

*Common, re-usable, holistic, data model  
constructs for generic and industry information*

# Universal Data Models Versus Patterns

- Re-usable models
- Use patterns
- Over 200 UDMs
- Common models
- Industry models

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# *Patterns in data modeling*

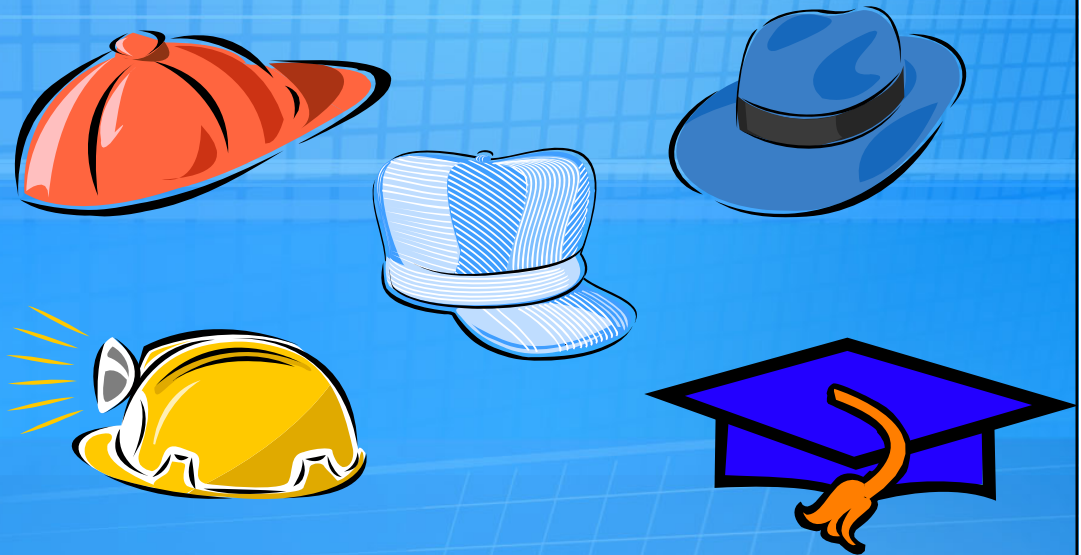
For re-use, consistency, and integration

**Roles**

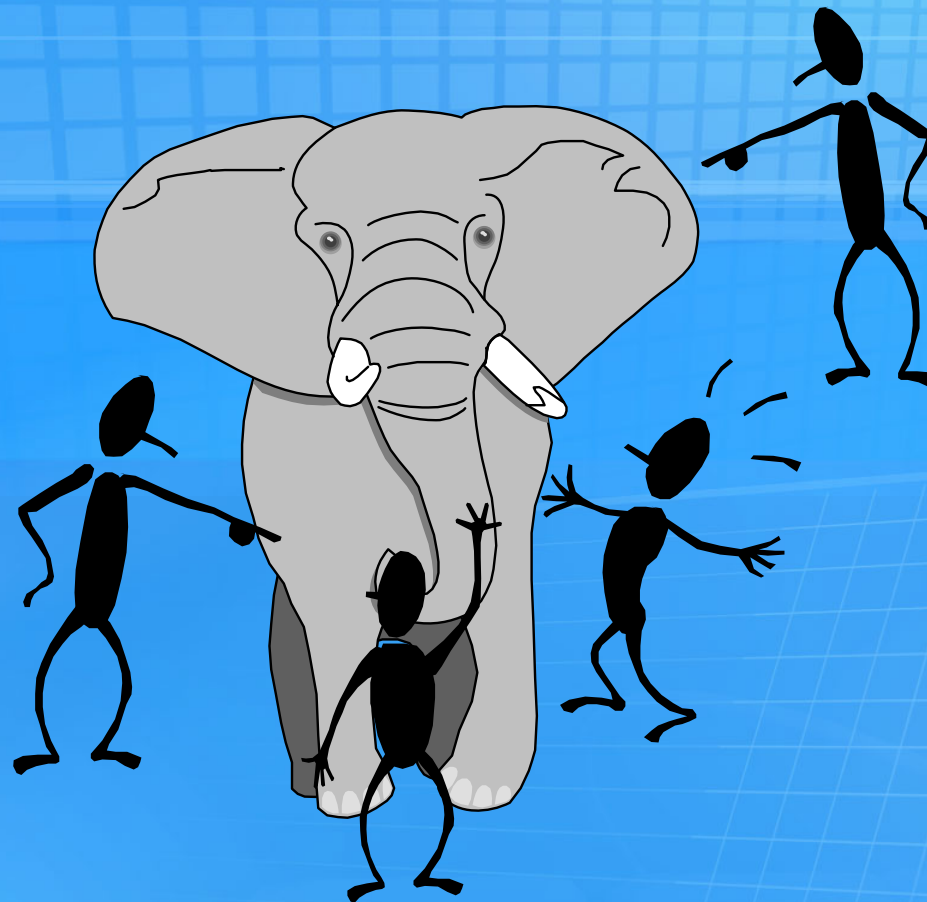
**Declarative**

**Contextual**

**Statuses**



# *INTEGRATION Question - What is an elephant to a blind person?*



*PROBLEM: Not seeing the whole picture*

# Who is this person?

## Are we operating partially blind?



*PROBLEM: Not seeing the whole picture*

# Declarative Role Pattern - Specific

## ENTITY1

ENTITY1 ID

ORGANIZATION NAME  
LAST NAME  
FIRST NAME  
MIDDLE NAME  
NAME SUFFIX  
NAME PREFIX  
ADDRESS ORGANIZATION NAM  
ADDRESS DEPARTMENT  
ADDRESS CONTACT NAME  
ADDRESS PO BOX  
ADDRESS BUILDING  
ADDRESS STREET  
ADDRESS HOUSE NUMBER  
ADDRESS LOCALITY  
ADDRESS POSTAL CODE  
ADDRESS PROVINCE  
ADDRESS COUNTRY  
ADDRESS FORMATTED  
PHONE NUMBER  
FAX NUMBER  
MOBILE NUMBER  
EMAIL ADDRESS  
PARTY ID (FK)

## ENTITY2

ENTITY2 ID

ORGANIZATION NAME  
LAST NAME  
FIRST NAME  
MIDDLE NAME  
NAME SUFFIX  
NAME PREFIX  
ADDRESS ORGANIZATION NAM  
ADDRESS DEPARTMENT  
ADDRESS CONTACT NAME  
ADDRESS PO BOX  
ADDRESS BUILDING  
ADDRESS STREET  
ADDRESS HOUSE NUMBER  
ADDRESS LOCALITY  
ADDRESS POSTAL CODE  
ADDRESS PROVINCE  
ADDRESS COUNTRY  
ADDRESS FORMATTED  
PHONE NUMBER  
FAX NUMBER  
MOBILE NUMBER  
EMAIL ADDRESS  
PARTY ID (FK)

## ENTITYN

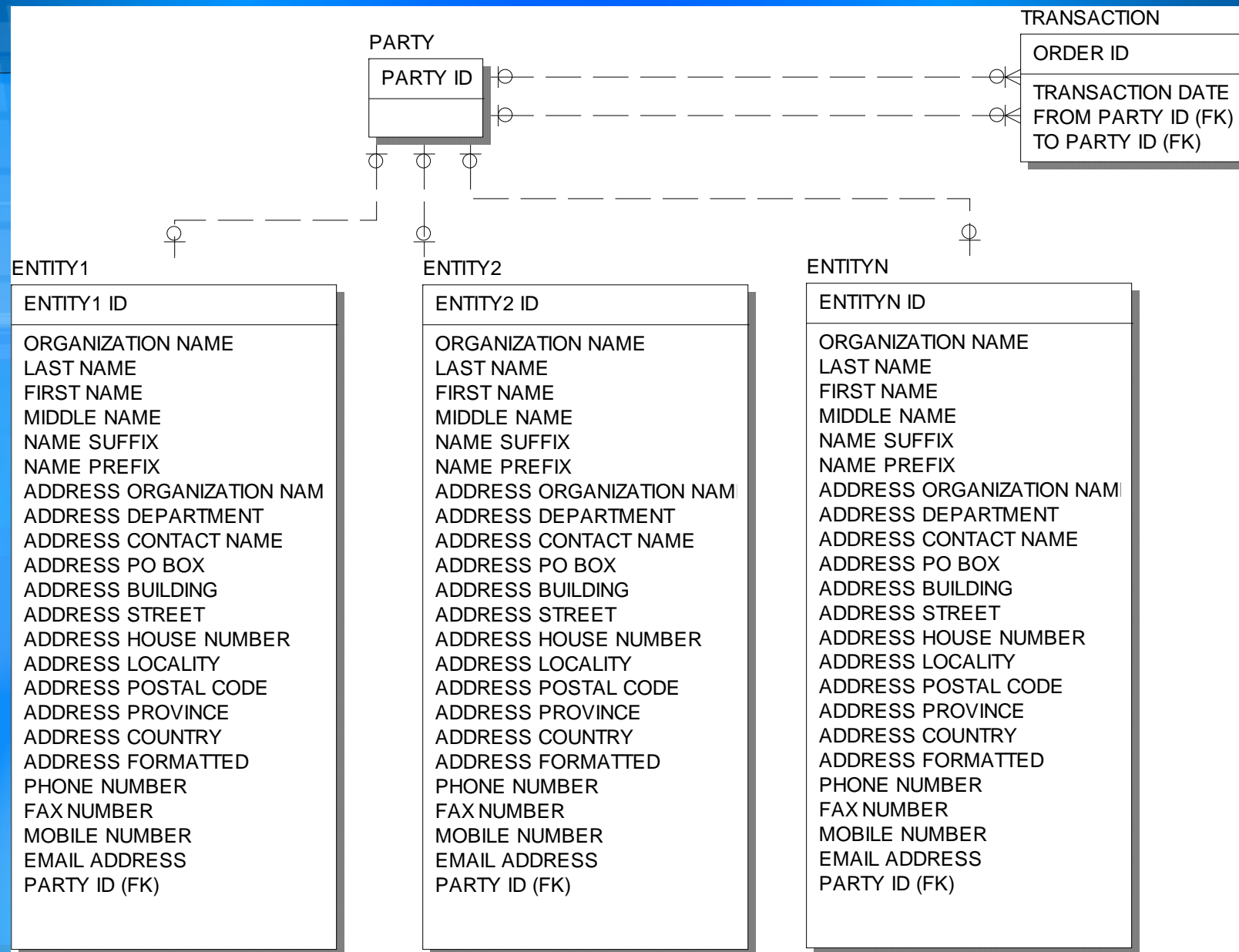
ENTITYn ID

ORGANIZATION NAME  
LAST NAME  
FIRST NAME  
MIDDLE NAME  
NAME SUFFIX  
NAME PREFIX  
ADDRESS ORGANIZATION NAM  
ADDRESS DEPARTMENT  
ADDRESS CONTACT NAME  
ADDRESS PO BOX  
ADDRESS BUILDING  
ADDRESS STREET  
ADDRESS HOUSE NUMBER  
ADDRESS LOCALITY  
ADDRESS POSTAL CODE  
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PHONE NUMBER  
FAX NUMBER  
MOBILE NUMBER  
EMAIL ADDRESS  
PARTY ID (FK)

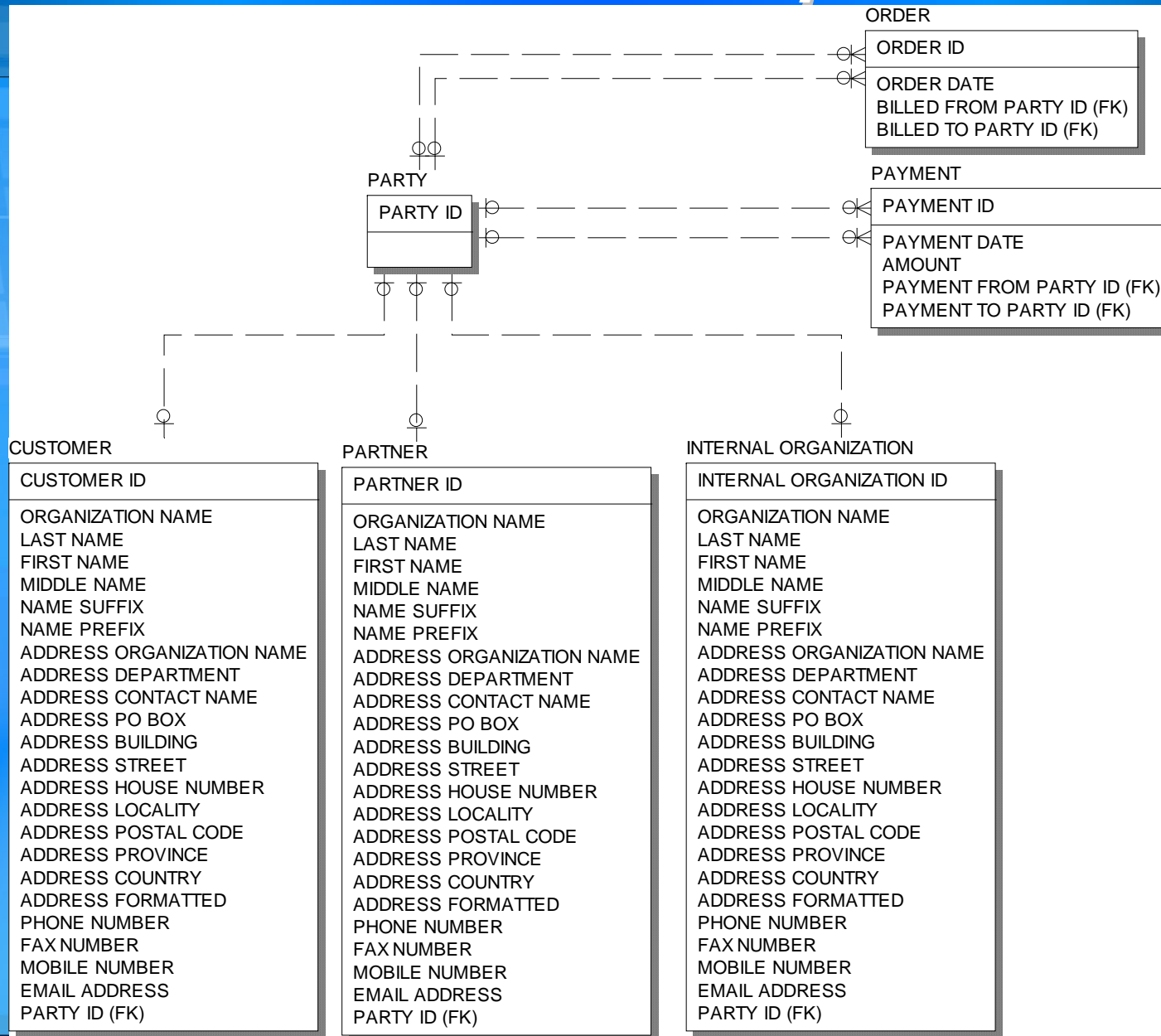
# Declarative Role Example - Specific

CUSTOMER	PROSPECT	CONTACT	PARTNER	SUPPLIER
CUSTOMER ID	PROSPECT ID	CONTACT ID	PARTNER ID	SUPPLIER ID
ORGANIZATION NAME	ORGANIZATION NAME	LAST NAME	ORGANIZATION NAME	ORGANIZATION NAME
LAST NAME	LAST NAME	FIRST NAME	LAST NAME	LAST NAME
FIRST NAME	FIRST NAME	MIDDLE NAME	FIRST NAME	FIRST NAME
MIDDLE NAME	MIDDLE NAME	NAME SUFFIX	MIDDLE NAME	MIDDLE NAME
NAME SUFFIX	NAME SUFFIX	NAME PREFIX	NAME SUFFIX	NAME SUFFIX
NAME PREFIX	NAME PREFIX	ADDRESS ORGANIZATION NAME	NAME PREFIX	NAME PREFIX
ADDRESS ORGANIZATION NAME	ADDRESS ORGANIZATION NAME	ADDRESS DEPARTMENT	ADDRESS ORGANIZATION NAME	ADDRESS ORGANIZATION NAME
ADDRESS DEPARTMENT	ADDRESS DEPARTMENT	ADDRESS CONTACT NAME	ADDRESS DEPARTMENT	ADDRESS DEPARTMENT
ADDRESS CONTACT NAME	ADDRESS CONTACT NAME	ADDRESS PO BOX	ADDRESS CONTACT NAME	ADDRESS CONTACT NAME
ADDRESS PO BOX	ADDRESS PO BOX	ADDRESS BUILDING	ADDRESS PO BOX	ADDRESS PO BOX
ADDRESS BUILDING	ADDRESS BUILDING	ADDRESS STREET	ADDRESS BUILDING	ADDRESS BUILDING
ADDRESS STREET	ADDRESS STREET	ADDRESS HOUSE NUMBER	ADDRESS STREET	ADDRESS STREET
ADDRESS HOUSE NUMBER	ADDRESS HOUSE NUMBER	ADDRESS LOCALITY	ADDRESS HOUSE NUMBER	ADDRESS HOUSE NUMBER
ADDRESS LOCALITY	ADDRESS LOCALITY	ADDRESS POSTAL CODE	ADDRESS LOCALITY	ADDRESS LOCALITY
ADDRESS POSTAL CODE	ADDRESS POSTAL CODE	ADDRESS PROVINCE	ADDRESS POSTAL CODE	ADDRESS POSTAL CODE
ADDRESS PROVINCE	ADDRESS PROVINCE	ADDRESS COUNTRY	ADDRESS PROVINCE	ADDRESS PROVINCE
ADDRESS COUNTRY	ADDRESS COUNTRY	ADDRESS FORMATTED	ADDRESS COUNTRY	ADDRESS COUNTRY
ADDRESS FORMATTED	ADDRESS FORMATTED	PHONE NUMBER	ADDRESS FORMATTED	ADDRESS FORMATTED
PHONE NUMBER	PHONE NUMBER	FAX NUMBER	PHONE NUMBER	PHONE NUMBER
FAX NUMBER	FAX NUMBER	MOBILE NUMBER	FAX NUMBER	FAX NUMBER
MOBILE NUMBER	MOBILE NUMBER	EMAIL ADDRESS	MOBILE NUMBER	MOBILE NUMBER
EMAIL ADDRESS	EMAIL ADDRESS		EMAIL ADDRESS	EMAIL ADDRESS
PARTY ID (FK)			PARTY ID (FK)	

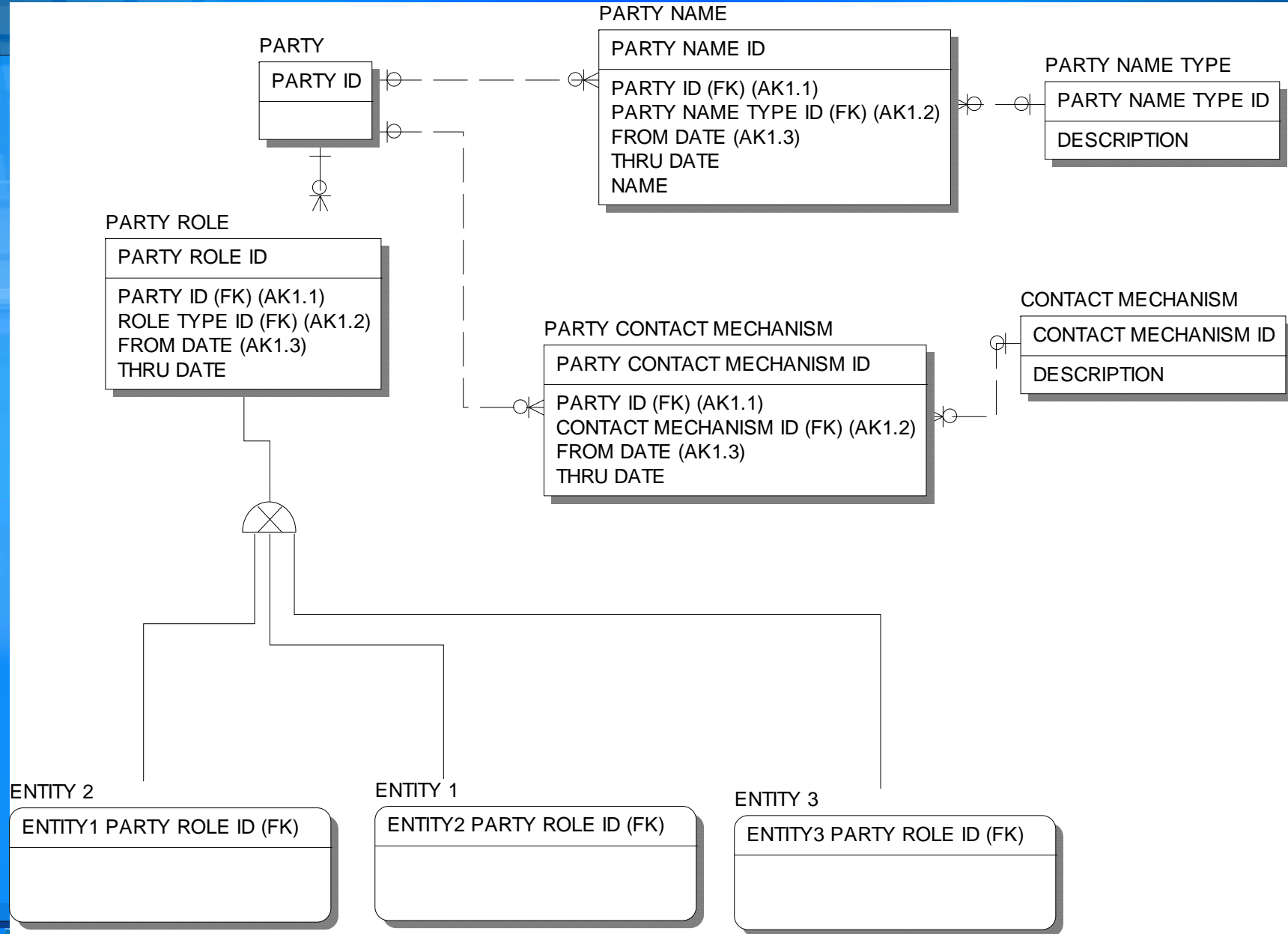
# Declarative Role Pattern - Middle



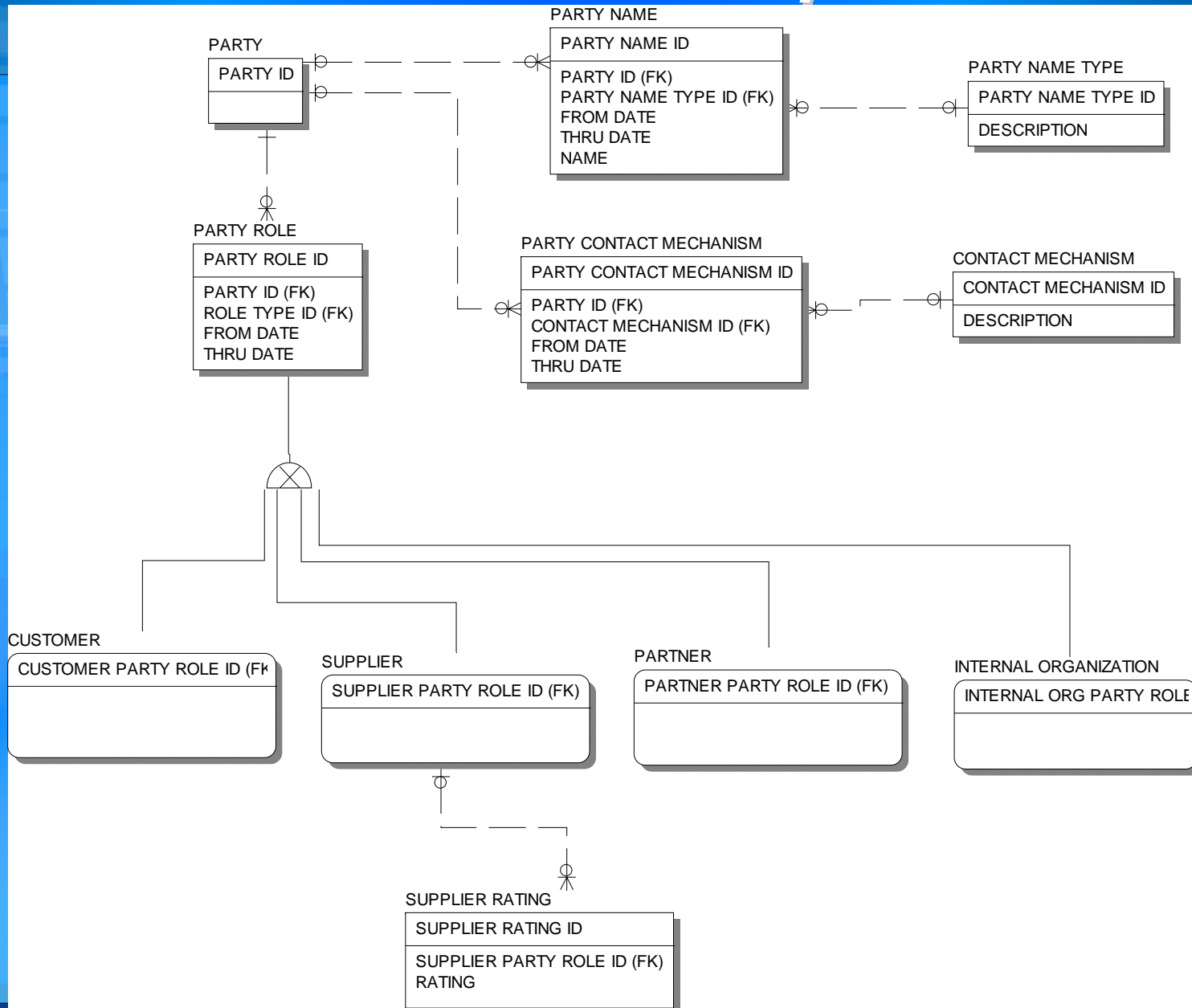
# Declarative Role Example - Middle



# Declarative Role Pattern - Flexible



# Declarative Role Example - Flexible



*What pattern would you choose for  
to declare/set up your parties?*

# *Contextual Roles*

*Occur within the context of another entity*

*E.G., ORDER*

*Bill to customer*

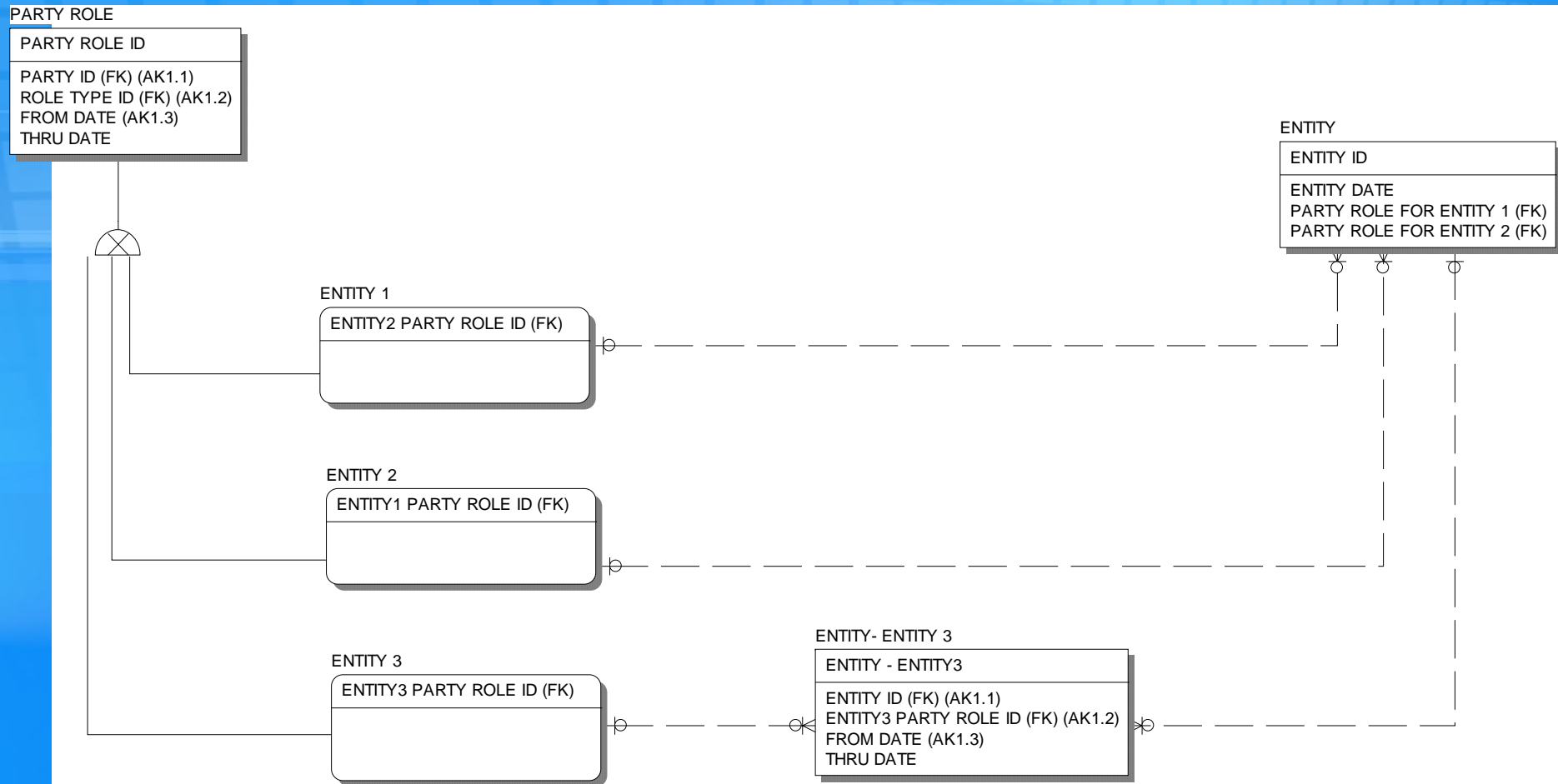
*Ship to customer*

*Internal organization taking order*

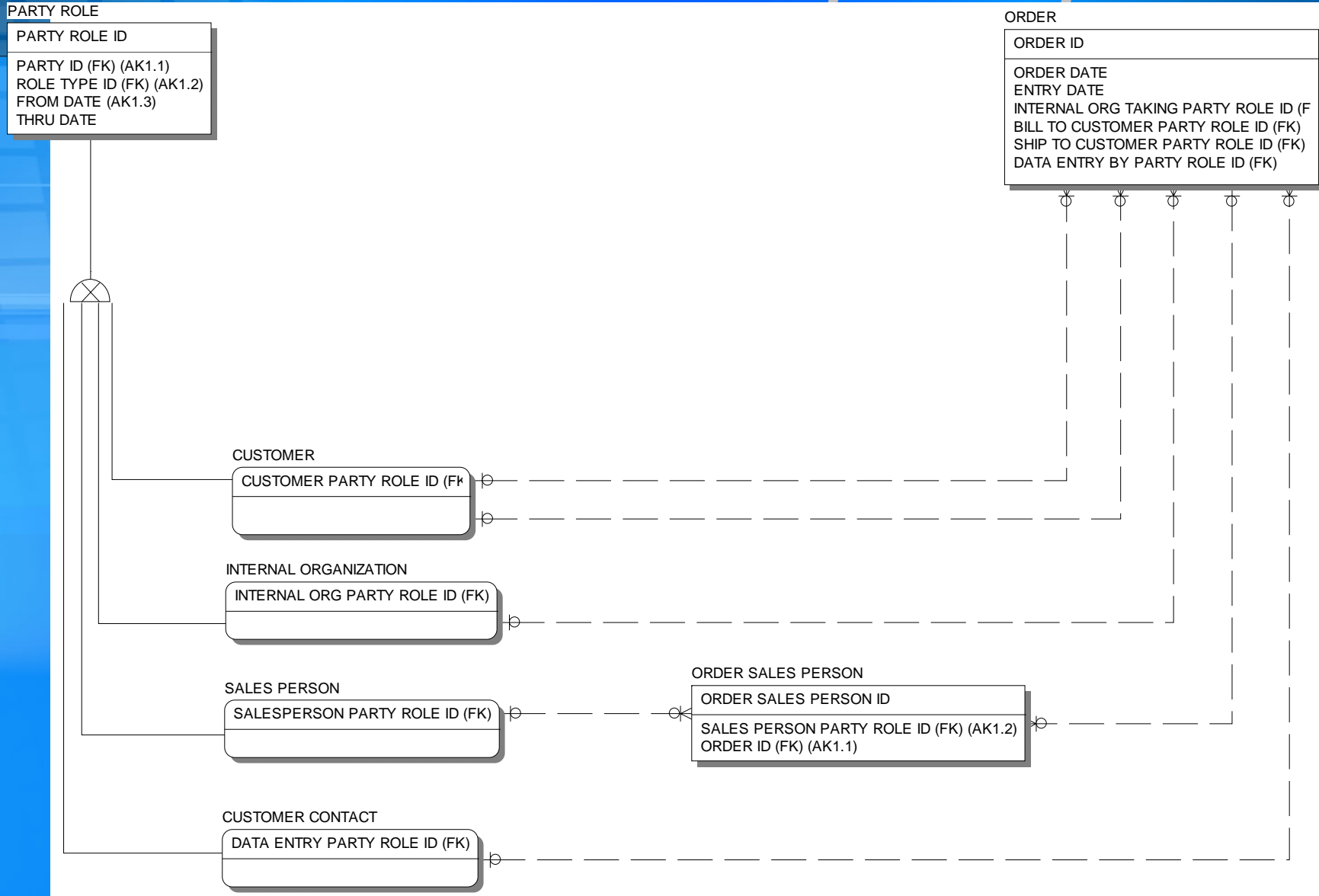
*Salesperson*

*Customer contact*

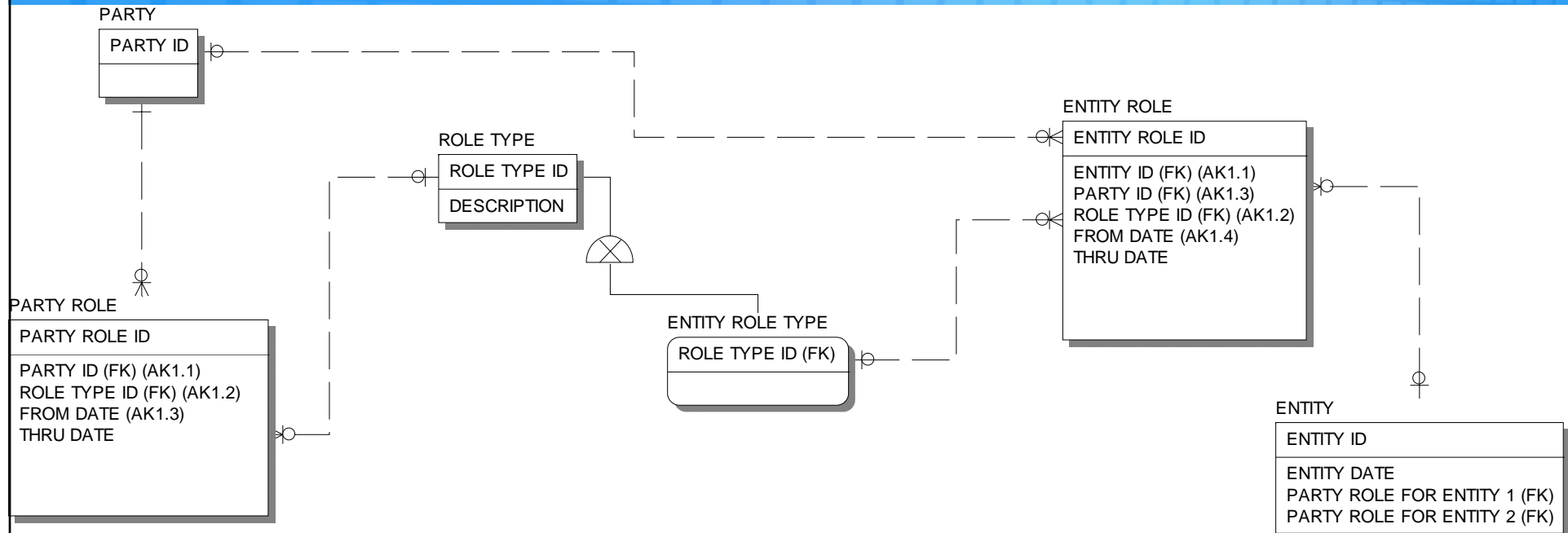
# Contextual Role Pattern - Specific



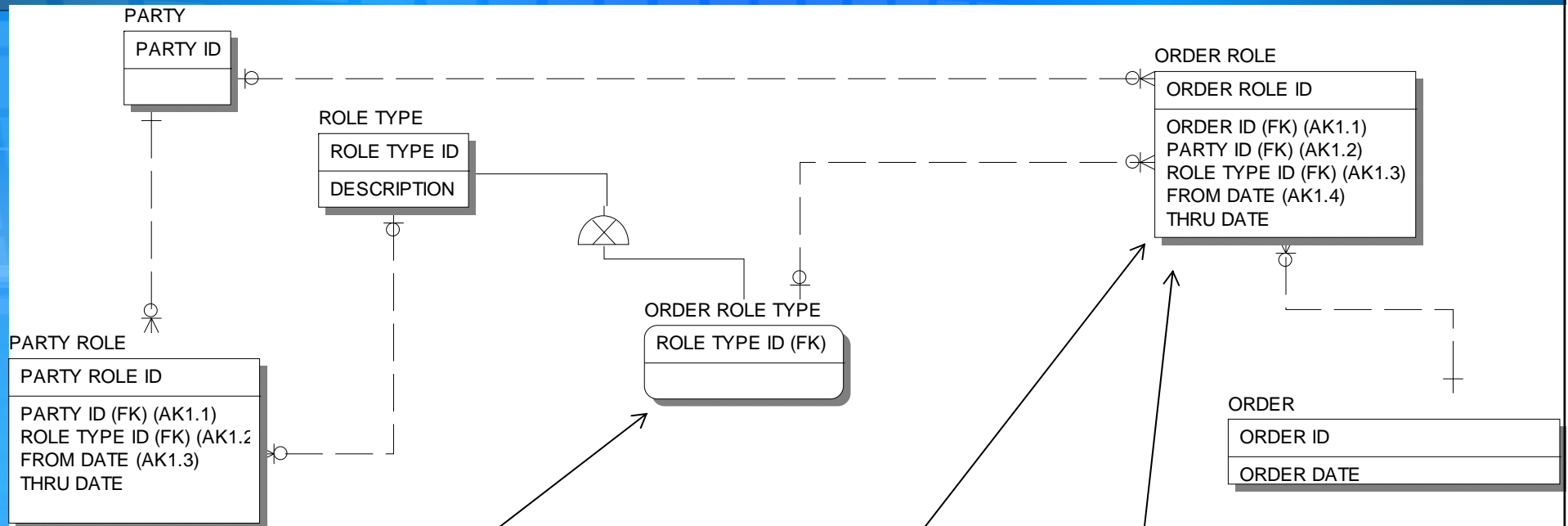
# Contextual Role Example - Specific



# Contextual Role Pattern - Abstract



# Contextual Role Pattern - Abstract

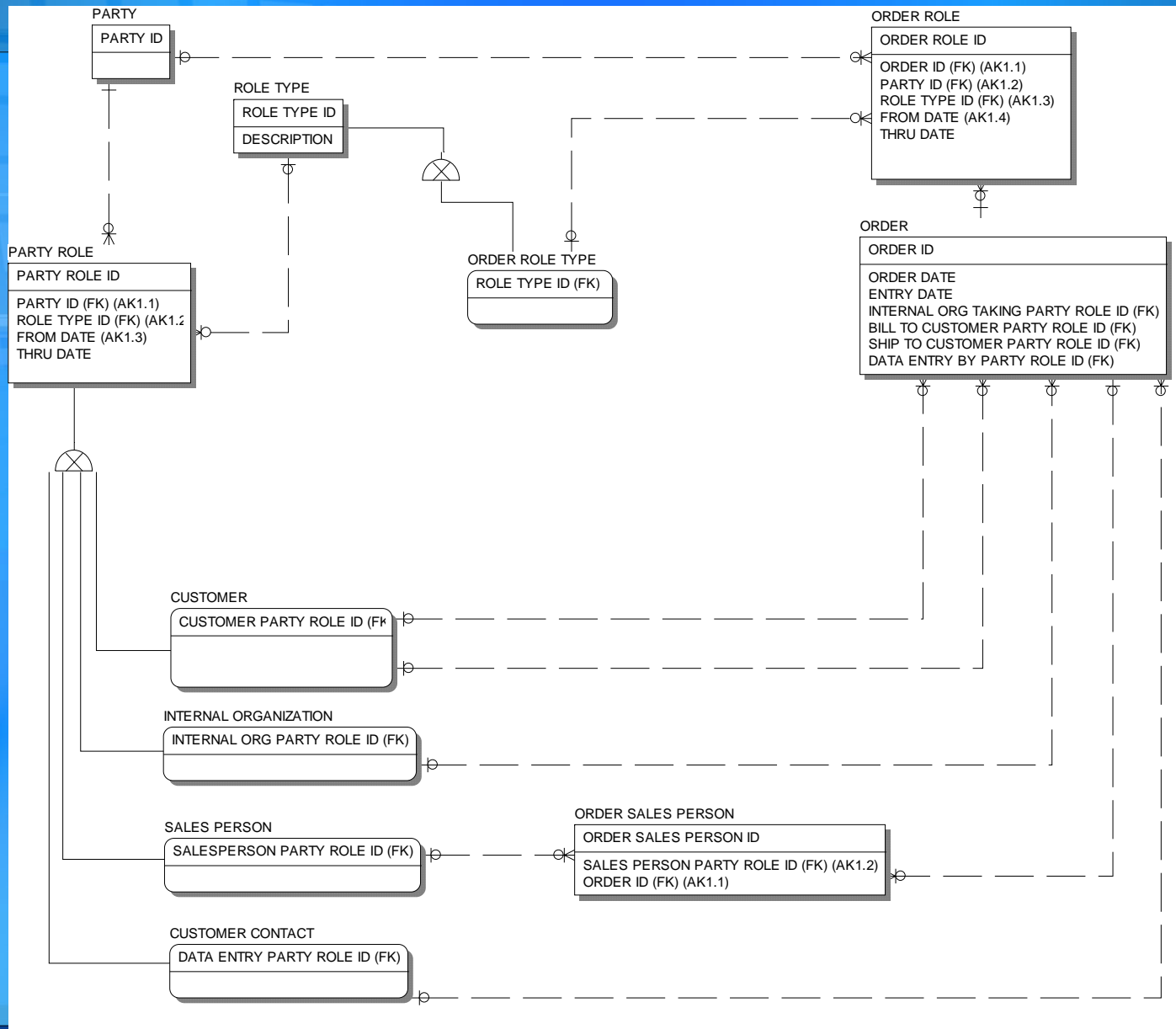


Ship To Customer  
 Bill To Customer  
 Taken By  
 Sales Person  
 Customer Contact

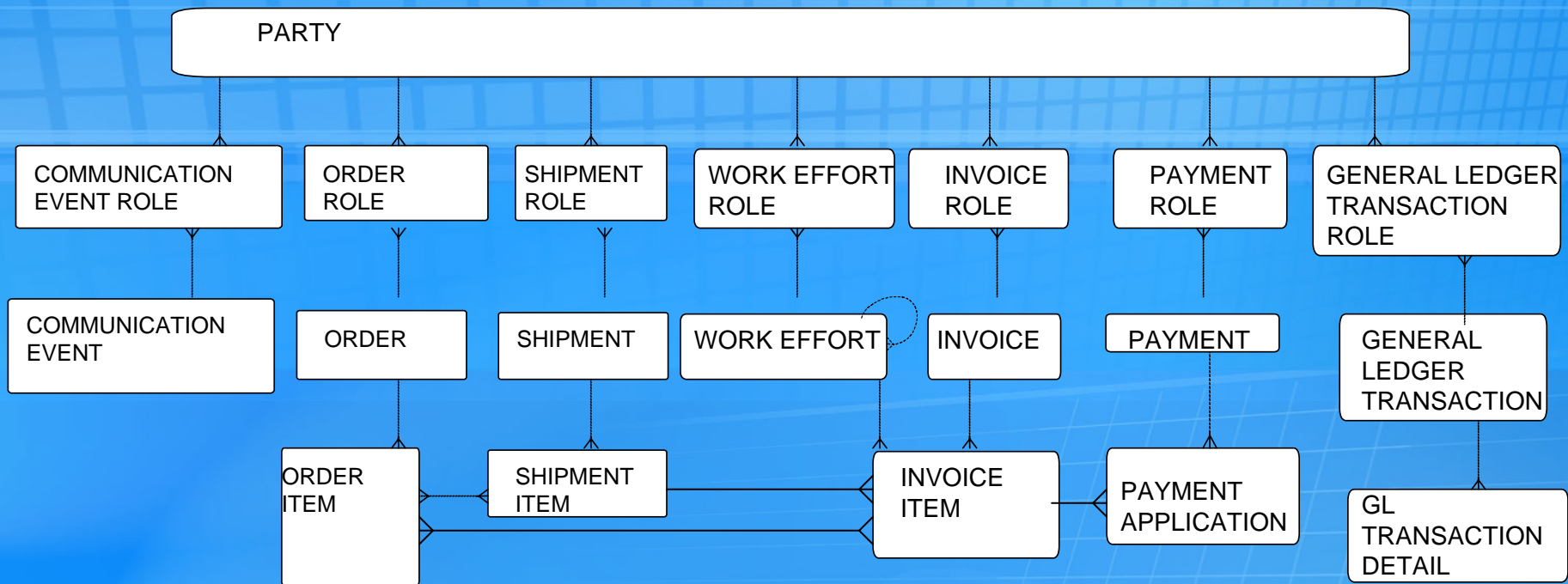
Order 123  
 Party – ABC Co  
 Role Type – Bill To Customer  
 From Date: Jan 23, 2005  
 Thru date

Order 123  
 Party – A Subsidiary, Inc.  
 Role Type – Ship To Customer  
 From Date: Jan 23, 2005  
 Thru date

# Contextual Role - Specific and Abstract



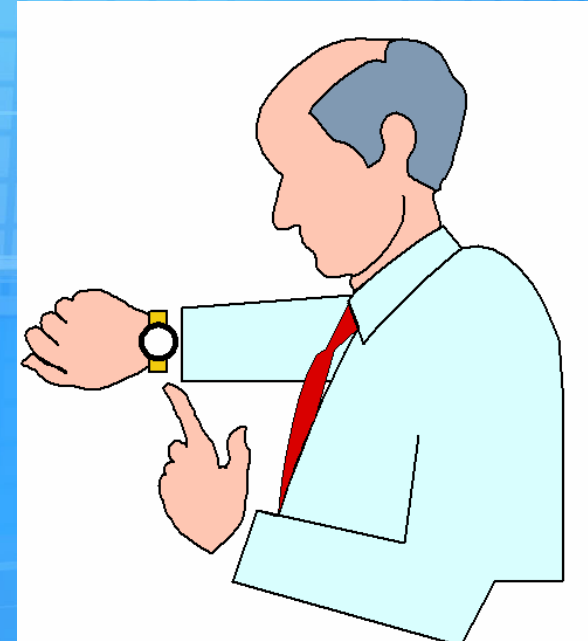
# Roles For Many Types of Transactions



*What pattern would you choose for to use roles (contextual roles)?*

# *Pattern - Statuses*

*Attributes?*  
*Flexible?*



# *Status Pattern - Specific*

ENTITY

ENTITY ID

STATUS1 DATETIME

STATUS2 DATETIME

STATUS3 DATETIME

STATUS4 DATETIME

STATUSN DATETIME

# *Status Example - Specific*

ORDER

ORDER ID

RECEIVED DATETIME

CONFIRMED DATETIME

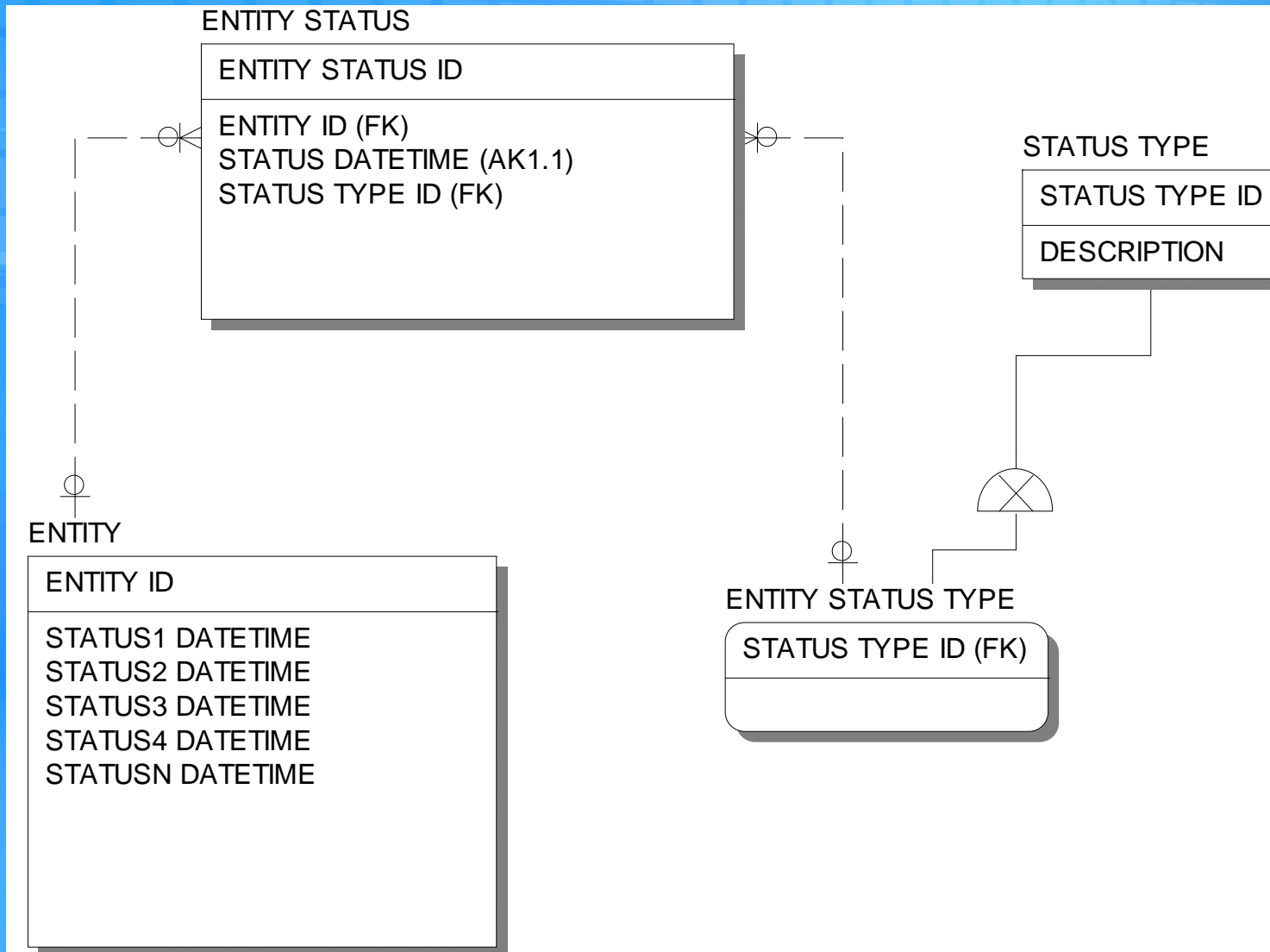
APPROVED DATETIME

EXPECTED DATETIME

INVOICED DATETIME

CANCELLED DATETIME

# Status Pattern - Abstract



# Status Example - Abstract

Order 123  
Received  
Jun 5, 2007

STATUS TYPE

STATUS TYPE ID

DESCRIPTION

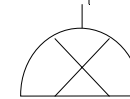
ORDER STATUS

ORDER STATUS ID

ORDER ID (FK) (AK1.3)

STATUS TYPE ID (FK) (AK1.1)

STATUS DATETIME (AK1.2)



Received  
Entered  
Confirmed  
Approved  
Shipped  
Cancelled

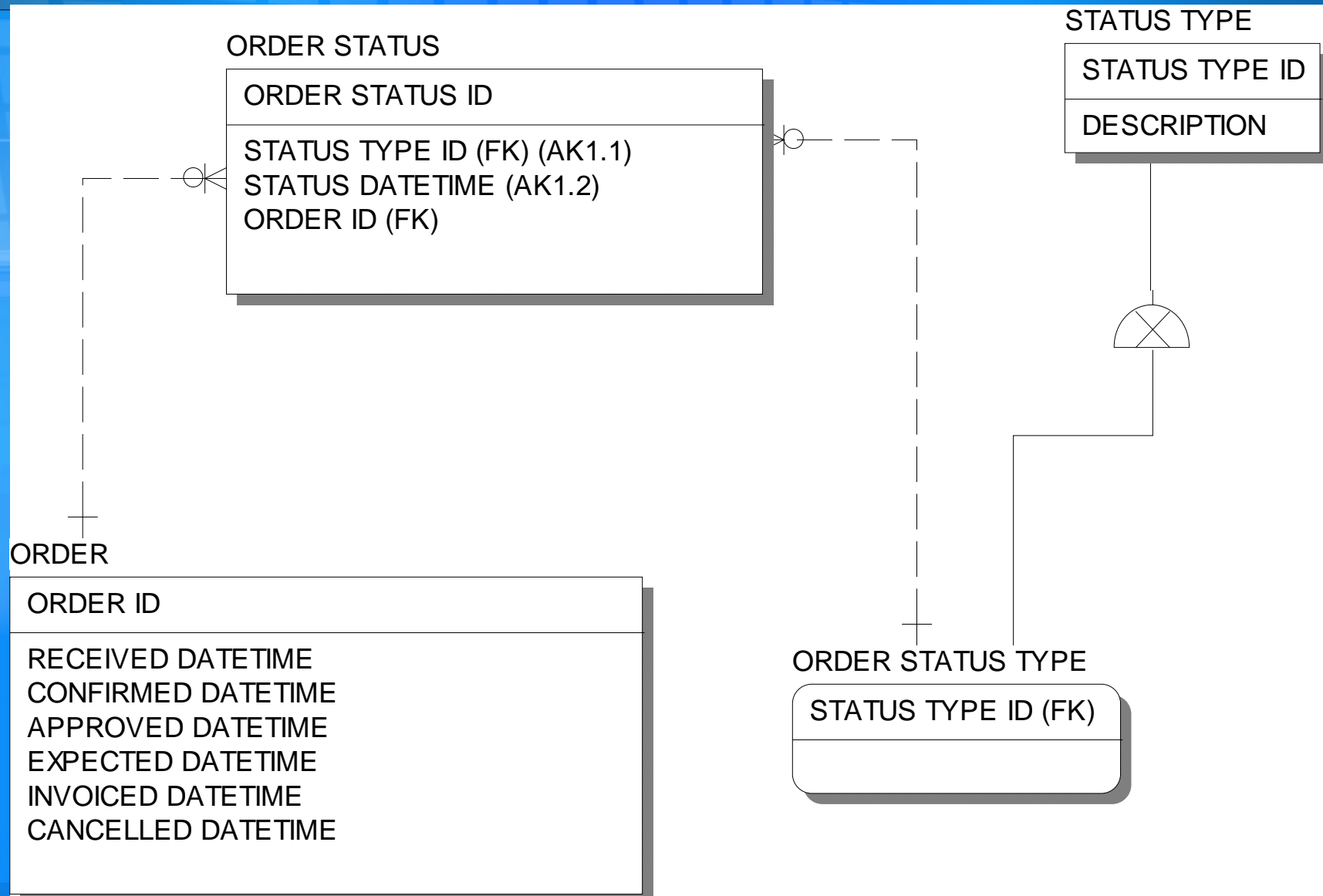
ORDER STATUS TYPE

STATUS TYPE ID (FK)

ORDER

ORDER ID

# Status Example – Specific and Abstract



*Where do you see the status pattern?  
What pattern would you choose?*

# *Specific Versus Abstract*

Specific  
Modeling

Flexible/Abstract  
Modeling

- Understandability
- Rules Enforcement

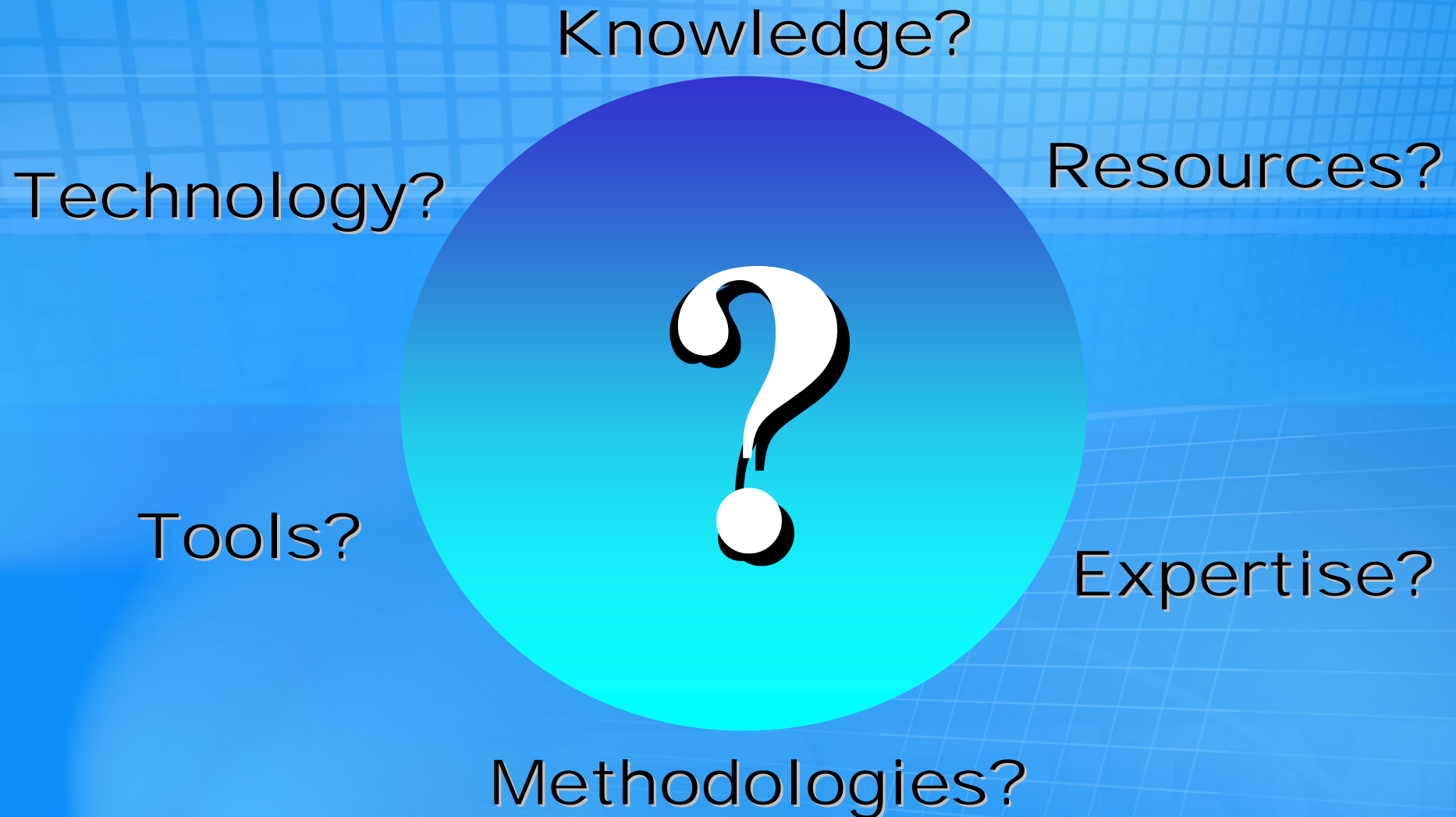
- Adaptability to change
- Maintainability

**BUT – HOW DO YOU SOCIALIZE THESE  
AND GET EVERYONE ON THE SAME PAGE?**

# *Universal Principles of Data Integration: The Human Side of Data Integration*



# *What is Needed to Integrate?*



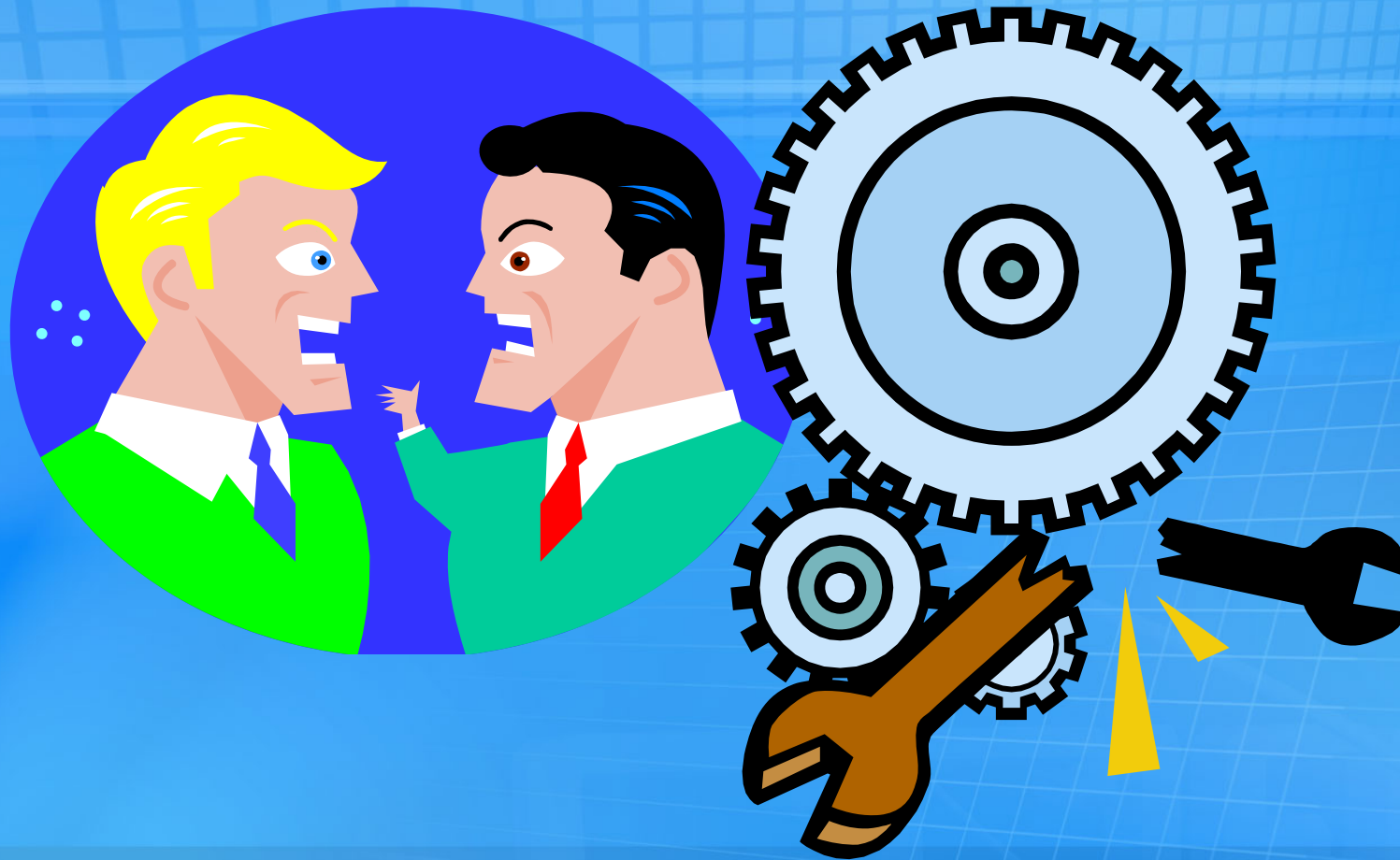
# A Distributor



# *A Financial Institution*



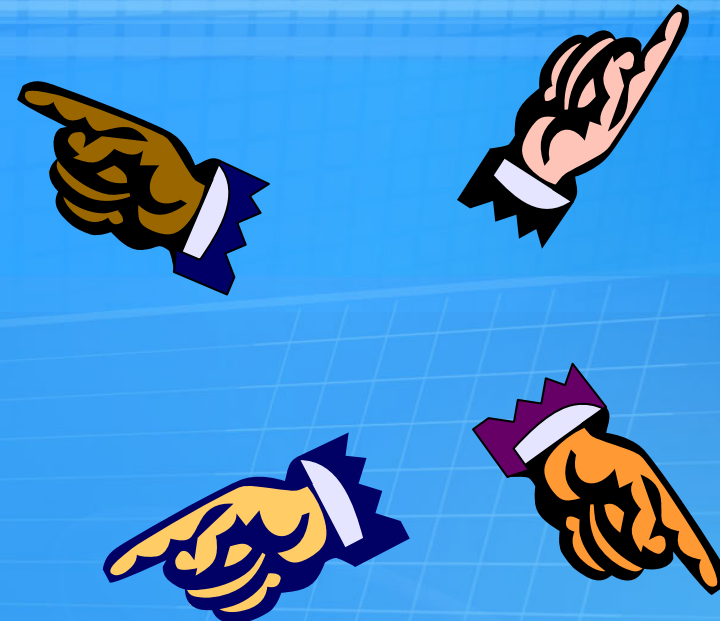
# *An Insurance Organization*



# Integration Versus Disintegration

*"Combining into a whole"*

*"To separate into parts"*



*Data silos come from people silos*

# *Disparate Databases*

- *Databases Equal Budgets*
- *Project Driven*



# *Planting in Fertile Soil*



# Integration Principles



*Have a clear, compelling,  
common vision*



# Clear

*Mission*

*Vision*

*Values*

*Goals*

*Benefits*

*Plan*



# *Compelling*

*Creating a Darwinian message to stand the test of time!*

*Content*

*(Quality systems/information)  
(Common understanding)*

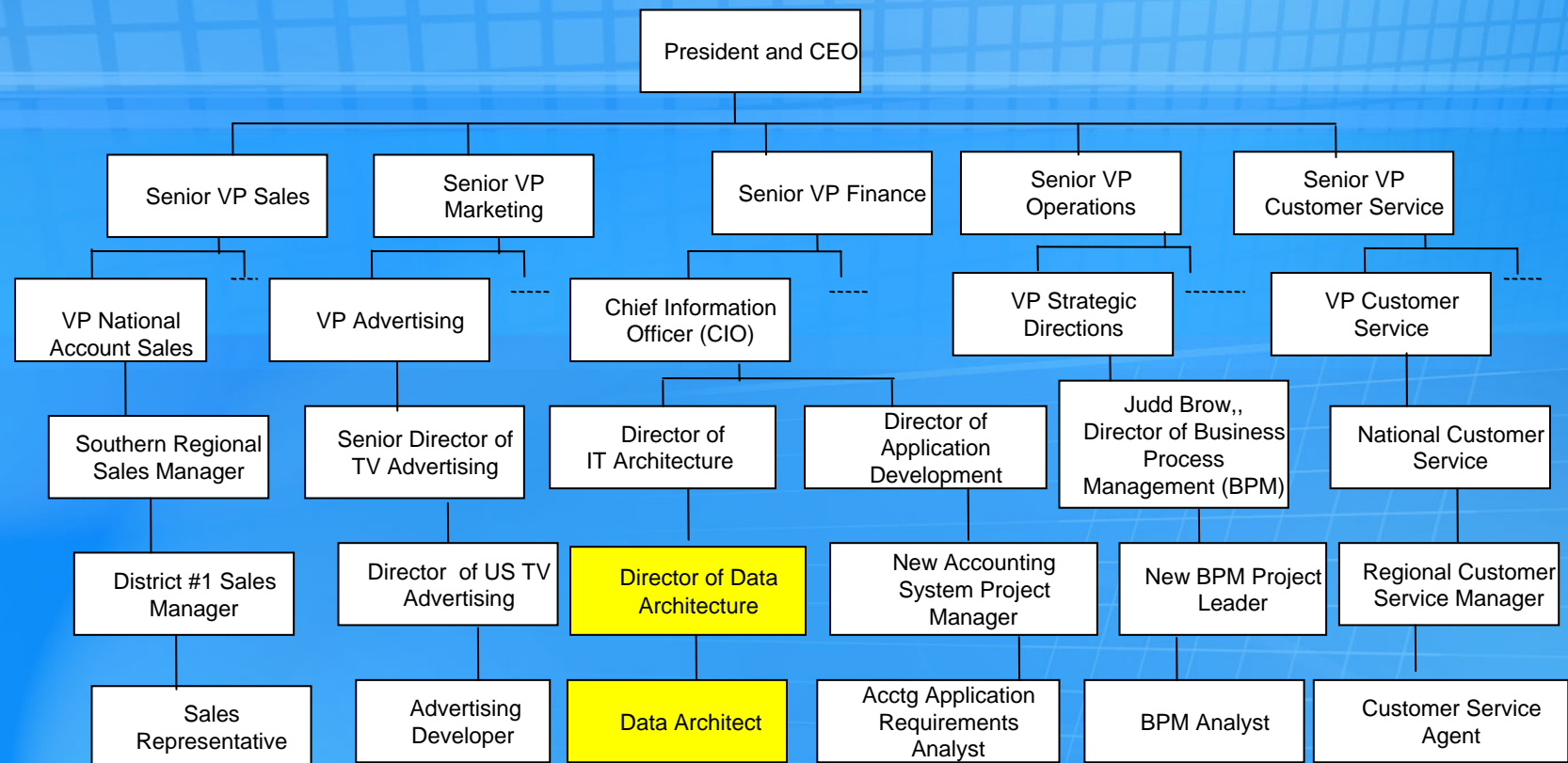
*and*

*Punch*

*(Rock Solid Foundation for  
Business Decisions)*

# Compelling

## How to create a message that gets through?



# Common

*Data Mgmt Mission*

Business Mission

*Common*

Business Mission

*Data Mgmt  
Mission*

## *Common*

*What is the enterprise's mission?*

*What is your personal mission?*

*What is the mission in data management/architecture?*

*How do they relate?*

# *Examples of Missions*

*Disney: "To make people happy"*

*Nike: "To Bring Inspiration and Innovation to Every Athlete\* in the World"*

*\* If you have a body, you are an Athlete.*

*Mary Kay: "To enrich woman's lives"*

## *Possible data integration/data management/data architecture/data warehousing mission statements*

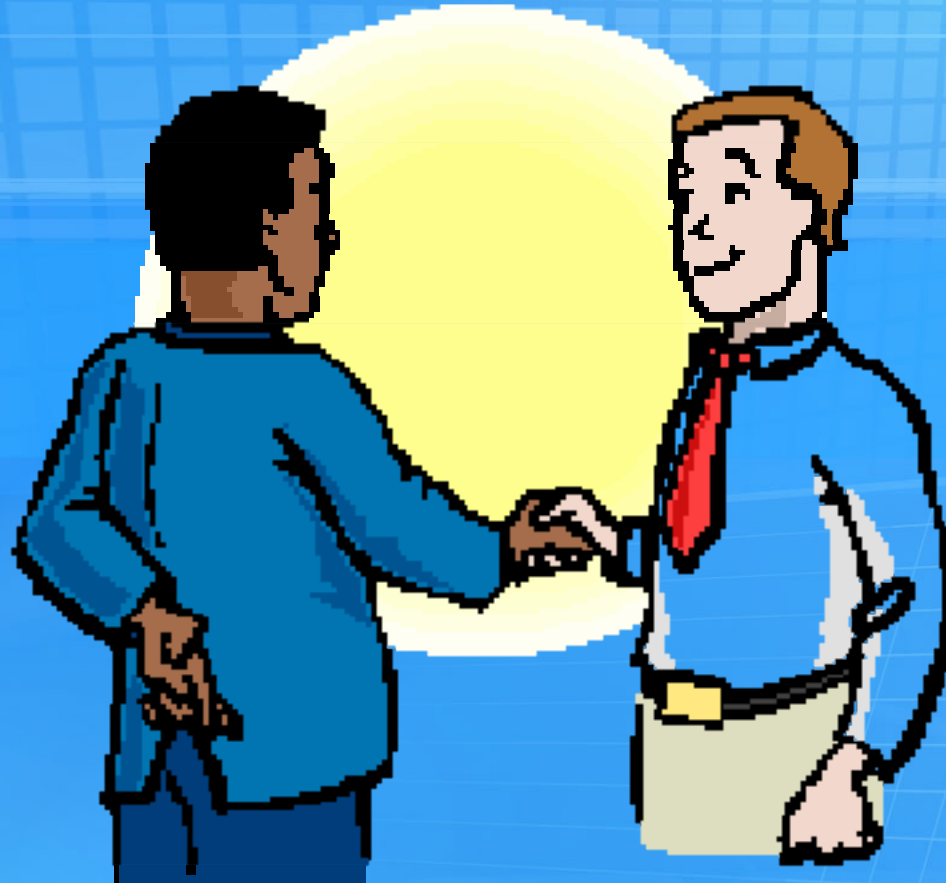
*Provide a foundation to enable the highest quality information*

*Provide the right data, at the right time for the right business decision*

*Enable rock solid information to assure quality business operations and decisions*

# *Integration Requires Trust (IRT)*

*Cordial hypocrisy versus honest assessment*



*"Integrity" derived from "To Integrate"*

# *Keys to Trust*

*Earning it*

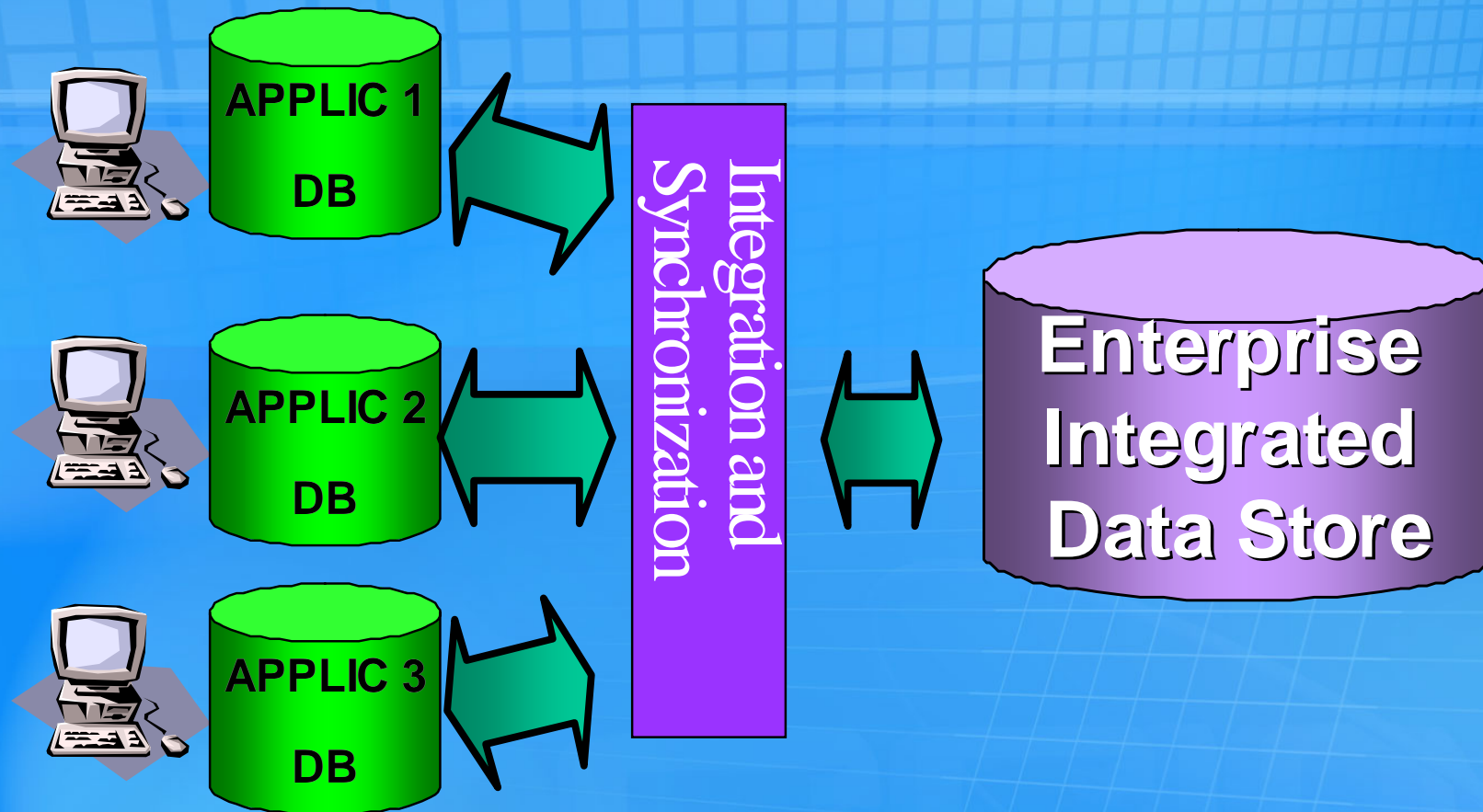
*Caring about others*

*Vulnerability/openness*



# Trust in Integration?

”Just give us your data to merge together with the rest of the enterprise’s data”



# *Developing Trust*

*What is a mistake that you have made?*

*What is something that you can share about yourself that leaves yourself vulnerable?*

# *Trust in Data Integration*

*How much trust has data architecture earned in your organization?*

*Why should management fund data architecture?*

*What would appropriate responses be to objections?*

# *Appreciate Perspectives Versus Being Right*

*What is the right way?*



# A Fictitious Scenario

*Director of data mgmt:*

*"We are excited to work together with you on this project helping you to integrate this data.*

*Sales Analysis Project Manager:*

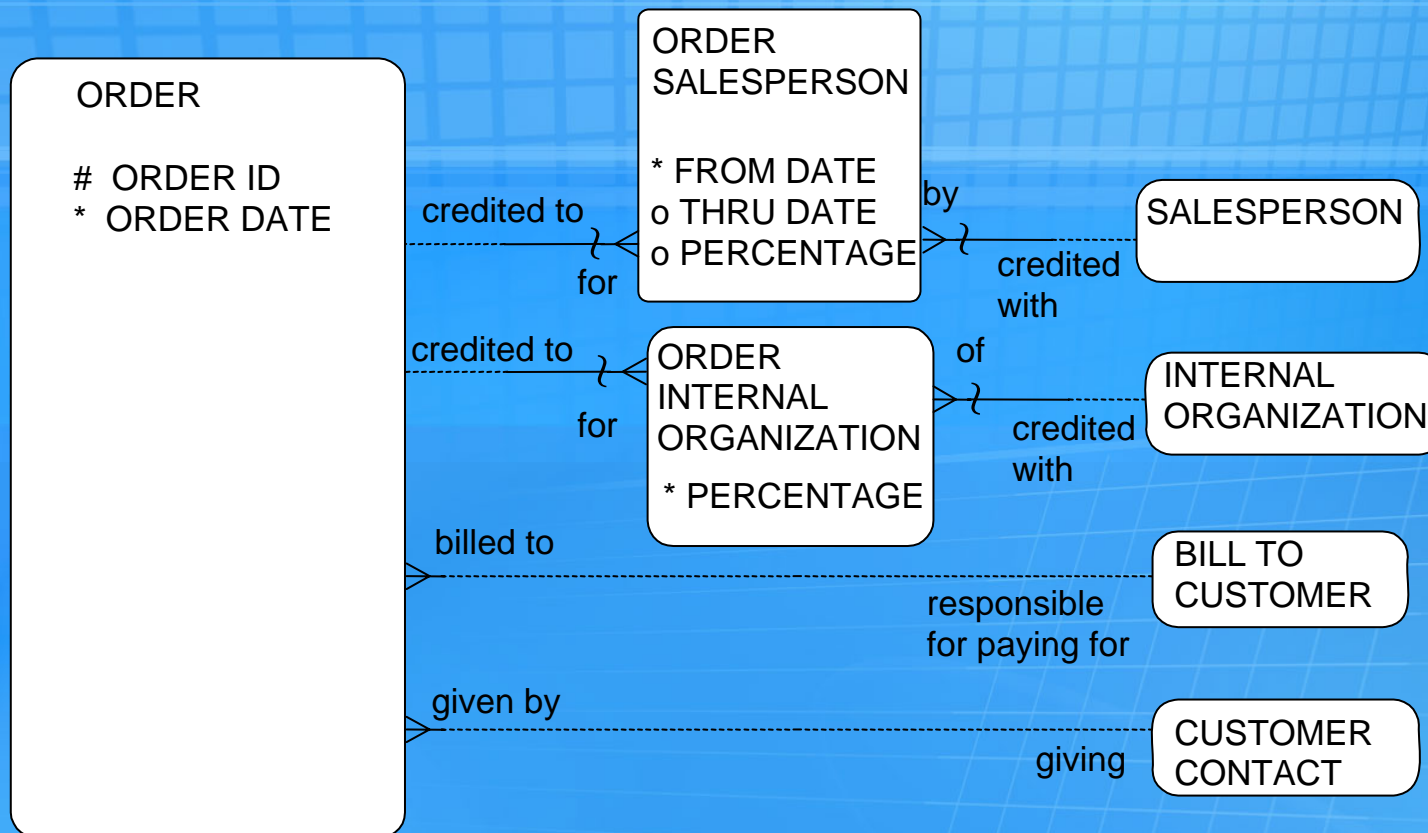
*We completely support enterprise wide architecture. However, we have very tight deadlines and budgets so we will work together as long as you don't impact our deadline dates, tasks, resources, or budgets in any way."*



*WHERE WOULD YOU TAKE THIS CONVERSATION?*

# Whose Model is Right?

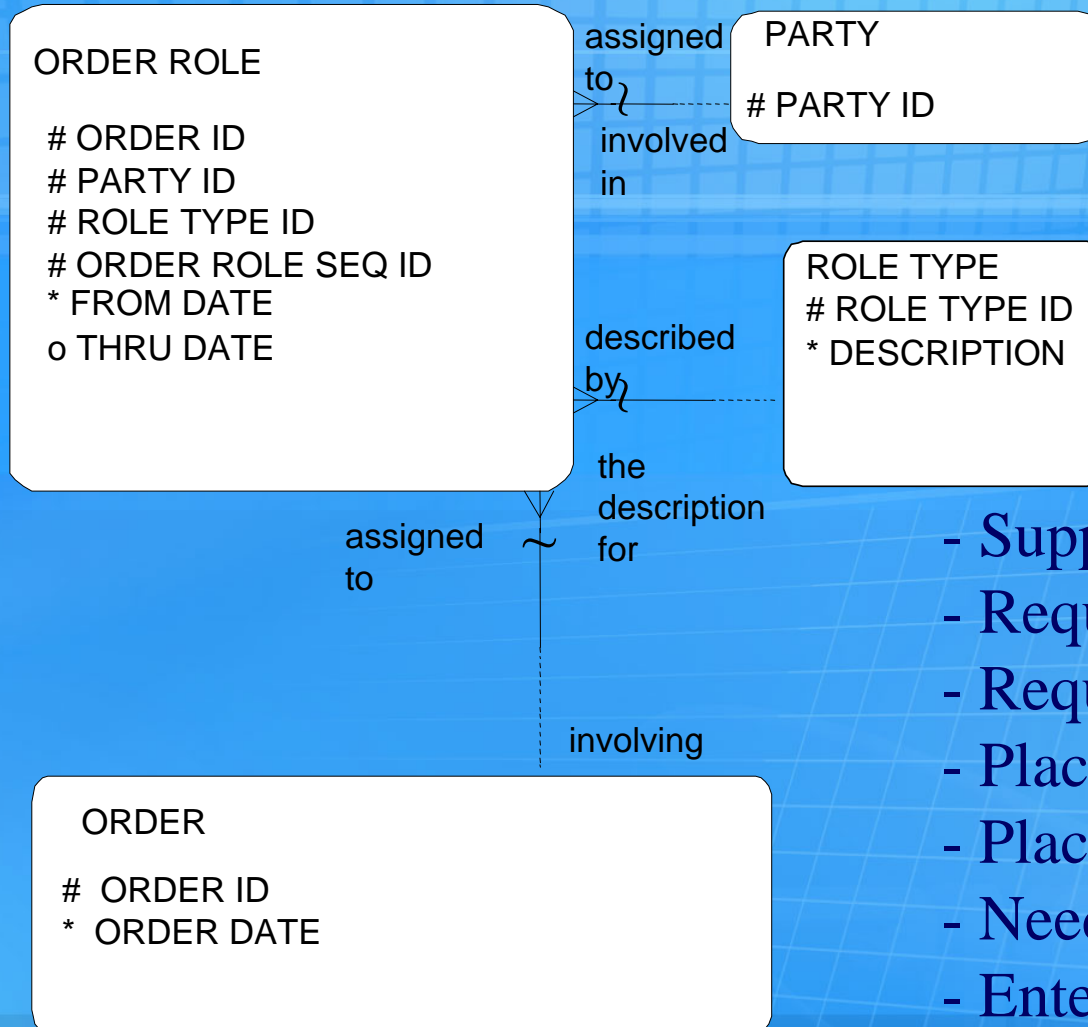
## Order Roles



# Whose Model is Right?

## Order Roles

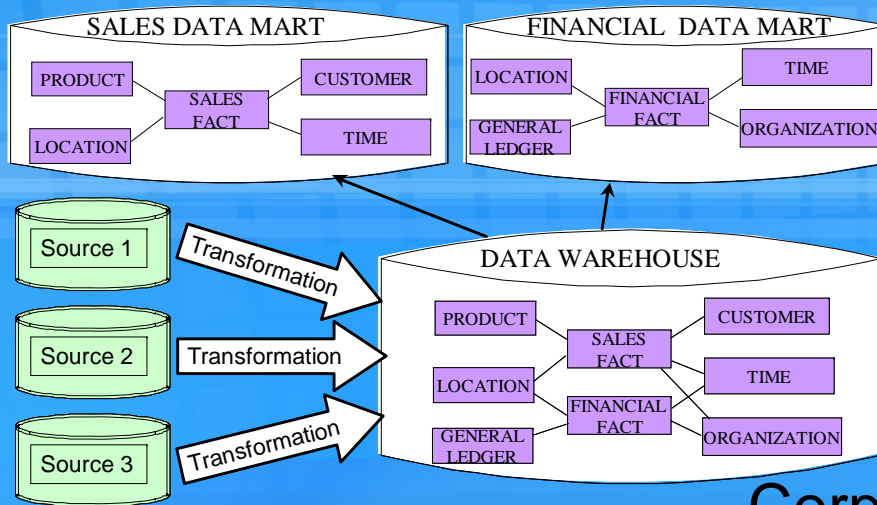
Order 123,  
Placed by,  
John Smith,  
1/6/06



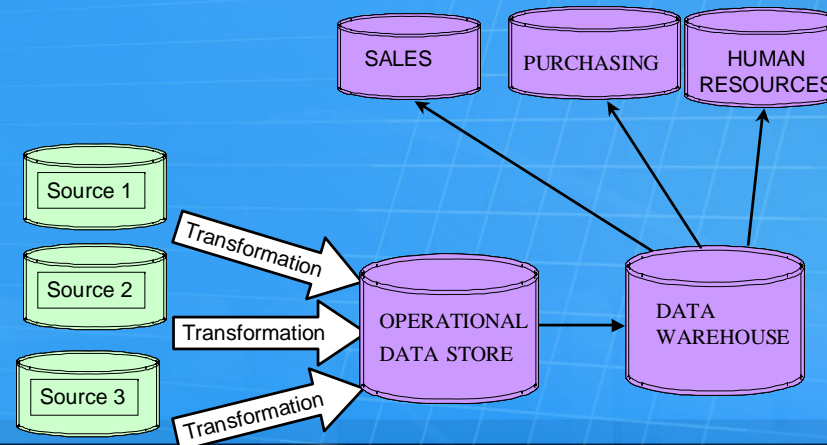
- Supplied by
- Requested bill to
- Requested ship to
- Placed by (person)
- Place by (org)
- Needed by
- Entered by

# Who's Methodology Is "Right"?

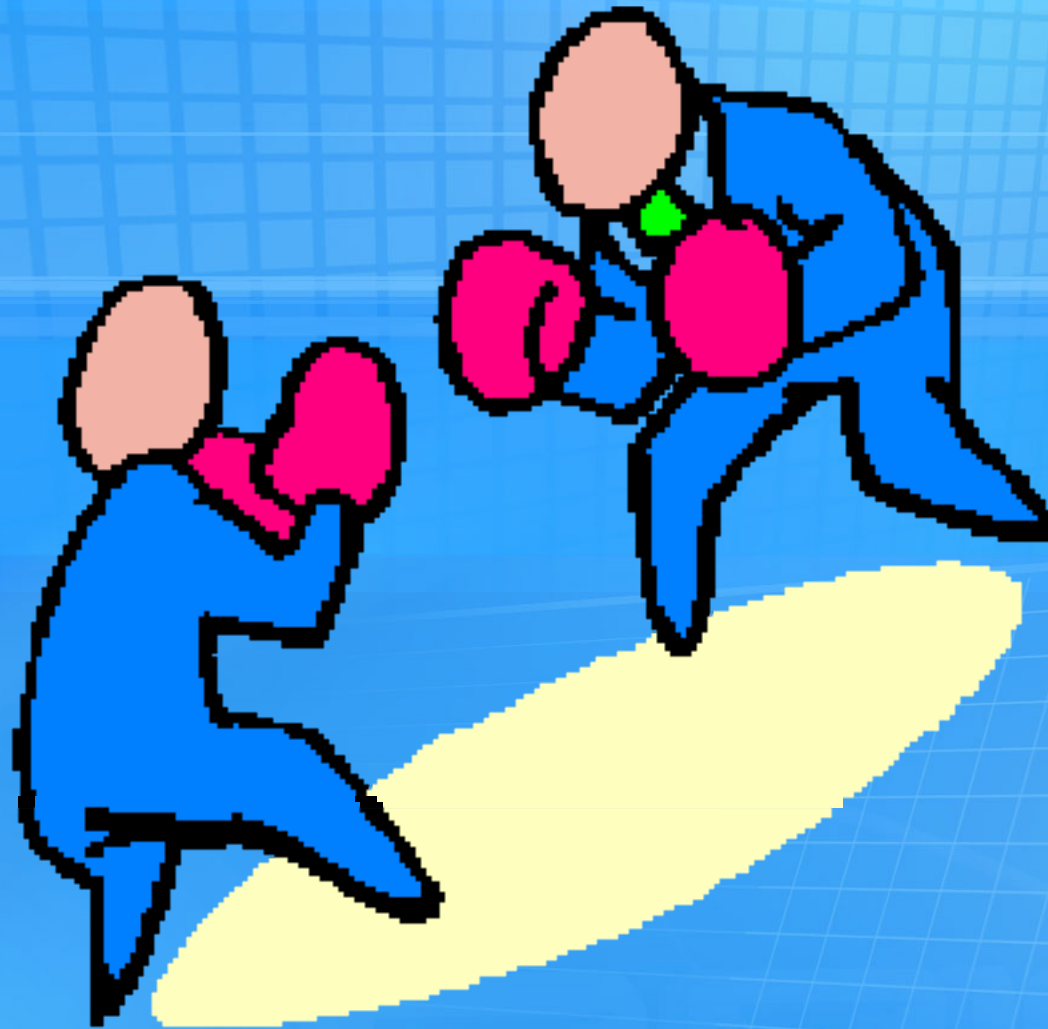
## Integrated Star Schema - Kimball



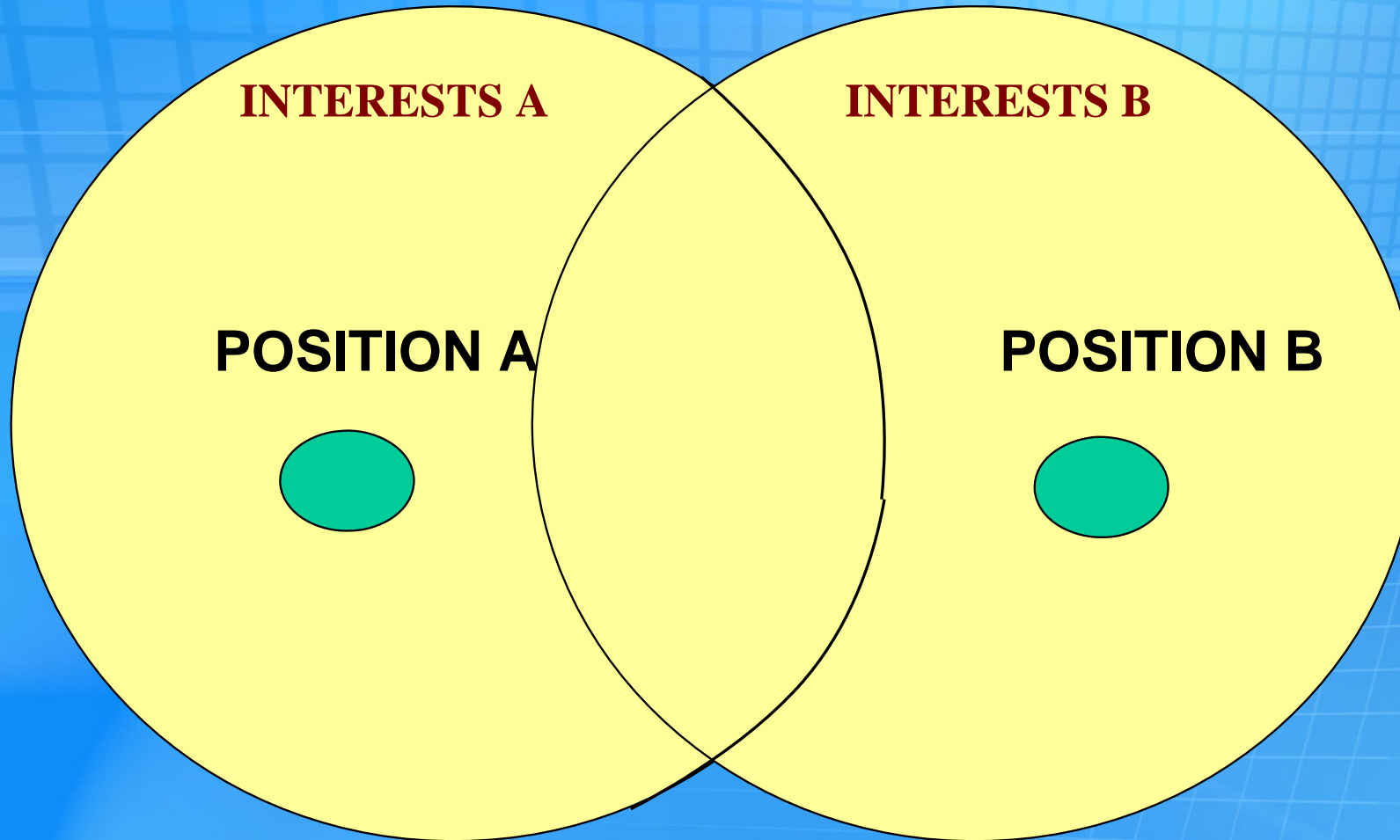
## Corporate Information Factory - Inmon



# Who's Data Is "Right"?



# *Position Versus Interest*



# *Handling Conflict*

*Step 1. Don't' react  
Stay objective*

*Step 2. Disarm  
Step to their side*

*Step 3. Change the game  
Don't reject ....Reframe (holistic) (common goal)*

*Step 4. Make it easy to say yes  
Build a golden bridge (truly win-win)*

*Step 5. Bring them to their senses, not their knees  
(using power, not force)*

From “Getting past No: Negotiating with Difficult People” By William Ury

# A Fictitious Scenario

*Director of data mgmt:*

*"We are excited to work together with you on this project helping you to integrate this data.*

*Sales Analysis Project Manager:*








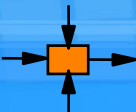

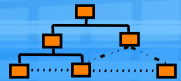

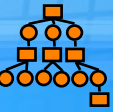
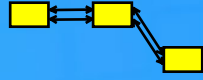
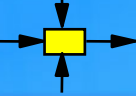

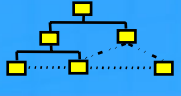

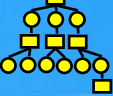
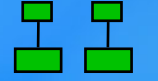











*We completely support enterprise wide architecture. However, we have very tight deadlines and budgets so we'll work together as long as you don't impact our deadline dates, tasks, resources, or budgets in any way."*



*WHERE WOULD YOU TAKE THIS CONVERSATION?*

# Re-Use – All Types of Re-usable Models

## ENTERPRISE ARCHITECTURE - A FRAMEWORK™

	DATA <i>What</i>	FUNCTION <i>How</i>	NETWORK <i>Where</i>	PEOPLE <i>Who</i>	TIME <i>When</i>	MOTIVATION <i>Why</i>	
SCOPE (CONTEXTUAL)  <i>Planner</i>	List of Things Important to the Business  Ent = Class of Business Thing	List of Processes the Business Performs  Function = Class of Business Process	List of Locations in which the Business Operates  Node = Major Business Location	List of Organizations Important to the Business  People = Major Organizations	List of Events Significant to the Business  Time = Major Business Event	List of Business Goals/Strat  Ends/Means=Major Bus. Goal/Critical Success Factor	SCOPE (CONTEXTUAL)  <i>Planner</i>
ENTERPRISE MODEL (CONCEPTUAL)  <i>Owner</i>	e.g. Semantic Model  Ent = Business Entity Reln = Business Relationship	e.g. Business Process Model  Proc. = Business Process I/O = Business Resources	e.g. Logistics Network  Node = Business Location Link = Business Linkage	e.g. Work Flow Model  People = Organization Unit Work = Work Product	e.g. Master Schedule  Time = Business Event Cycle = Business Cycle	e.g. Business Plan  End = Business Objective Means = Business Strategy	ENTERPRISE MODEL (CONCEPTUAL)  <i>Owner</i>
SYSTEM MODEL (LOGICAL)  <i>Designer</i>	e.g. Logical Data Model  Ent = Data Entity Reln = Data Relationship	e.g. "Application Architecture"  Proc. = Application Function I/O = User Views	e.g. "Distributed System Architecture"  Node = I/S Function (Processor, Storage, etc.) Link = Line Characteristics	e.g. Human Interface Architecture  People = Role Work = Deliverable	e.g. Processing Structure  Time = System Event Cycle = Processing Cycle	e.g., Business Rule Model  End = Structural Assertion Means = Action Assertion	SYSTEM MODEL (LOGICAL)  <i>Designer</i>
TECHNOLOGY MODEL (PHYSICAL)  <i>Builder</i>	e.g. Physical Data Model  Ent = Segment/Table/etc. Reln = Pointer/Key/etc.	e.g. "System Design"  Proc. = Computer Function I/O = Screen/Device Formats	e.g. "System Architecture"  Node = Hardware/System Software Link = Line Specifications	e.g. Presentation Architecture  People = User Work = Screen Format	e.g. Control Structure  Time = Execute Cycle = Component Cycle	e.g. Rule Design  End = Condition Means = Action	TECHNOLOGY CONSTRAINED MODEL (PHYSICAL)  <i>Builder</i>
DETAILED REPRESENTATIONS (OUT-OF-CONTEXT)  <i>Sub-Contractor</i>	e.g. Data Definition  Ent = Field Reln = Address	e.g. "Program"  Proc. = Language Stmt I/O = Control Block	e.g. "Network Architecture"  Node = Addresses Link = Protocols	e.g. Security Architecture  People = Identity Work = Job	e.g. Timing Definition  Time = Interrupt Cycle = Machine Cycle	e.g. Rule Specification  End = Sub-condition Means = Step	DETAILED REPRESENTATIONS (OUT-OF-CONTEXT)  <i>Sub-Contractor</i>
FUNCTIONING ENTERPRISE	e.g. DATA	e.g. FUNCTION	e.g. NETWORK	e.g. ORGANIZATION	e.g. SCHEDULE	e.g. STRATEGY	FUNCTIONING ENTERPRISE

Zachman Institute for Framework Advancement

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# *What Is One Of Your Largest Issues?*

*How can you apply these principles to this issue?*



# *Summary*

## *Universal Models*

*Universal Data Models*

*Universal Patterns*

## *Universal Principles*

*Vision*

*Trust*

*Appreciating Perspectives*

*Re-use*

# Additional Information

- **CONTACT INFORMATION**

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[www.universaldatamodels.com](http://www.universaldatamodels.com)

303 688 1412

- **COURSES:**

- Power, Control and Politics in Data Management
- Universal Data Models and Patterns

- **UNIVERSAL DATA MODEL REPOSITORY AND JUMP-START**

- UDM Repository in Erwin (common and industry models)
- UDM 3-10 day Jump-Start Program

