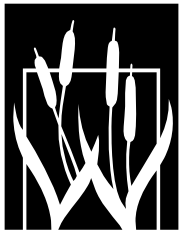

Whitemarsh
Information Systems Corporation

Data Interoperability Strategy Seminar (Two hours)

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Email: Whitemarsh@wiscorp.com
Web: www.wiscorp.com

Table of Contents

1.0 Whitemarsh

- Founded in 1981
- Website: www.wiscorp.com
- Key Concentration Area: Data Management
- Delivery Mechanisms
  - ♦ Knowledge Ware (books and papers)
  - ♦ Software
  - ♦ Consulting, Seminars and Workshops

Whitemarsh Clients:

- Bank of America, California
- Delaware Public Safety Database
- DOD Strategic Defense Initiative Office
- DuPont Corporation
- Federal Government of Canada
- Freddie Mac
- Grumman Data Corporation and BDM International
- Hershey Chocolate Company
- Mars Corporation
- International Committee for Information Technology Standards
- Ohio State Supreme Court
- Prince George's County Board of Education
- Social Security Administration
- State of California
- The MITRE Corporation
- U.S. Army
- U.S. Navy
- U.S. Department of Commerce
- U.S. Department of Veterans Affairs
- U.S. Office of Trademarks
- U.S. Office of Personnel Management
- U.S. DoD, Defense Logistics Agency
- U.S. DoD Office of Assistant Inspector General for Audits

Note: Descriptions of Whitemarsh client engagements are at www.wiscorp.com

Goals of the Data Interoperability Strategy Seminar: **Confirm with you that:**

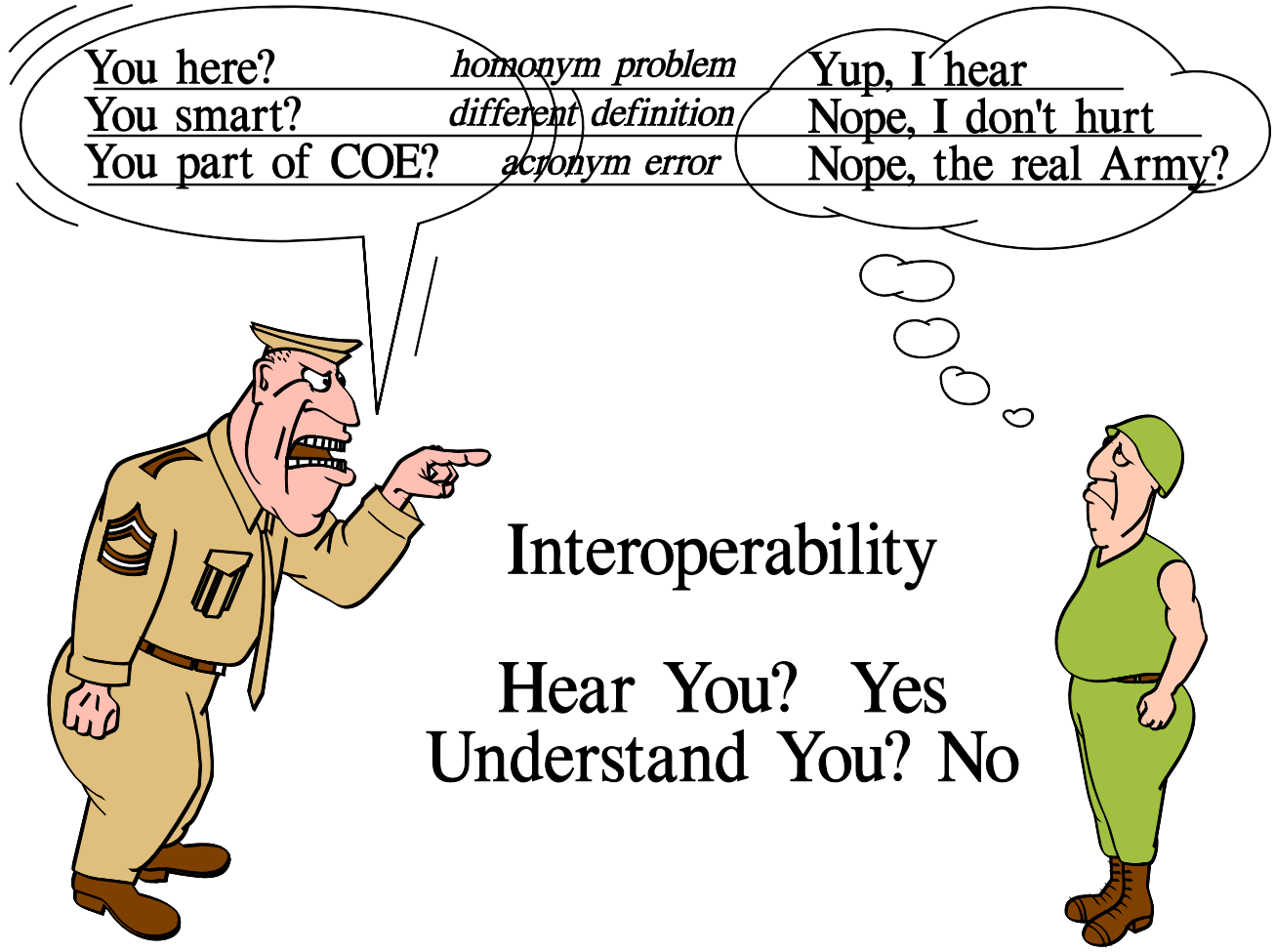
- There can be a viable strategy for achieving understanding-based data interoperability.
- Such a strategy is based on fundamental data management principles that you already know and/or use everyday.
- There is no Silver Bullet that will save us.
- All this is just highly-proceduralized common sense.

Remember, this 2-hour Strategy Seminar not a how-to workshop. Whitemarsh has an 8-hour Strategy seminar and a how-to workshop that takes a whole week.

Before we really begin, What is Data?

- Data is "what" remains after ***Policy*** is executed. ***Thus, Data is Executed Policy***.
- Processes are the ***Procedures*** through which the policy execution is accomplished
- "Data" Definitions are thus Policy Definitions
- Enterprise Architecture, Data Administration, Data Standardization, and Database Design is a "Enterprise Policy Specification" activity
- All data (i.e., policy) specifications are metadata.
- All process (i.e., procedure) specifications are metadata
- A Metadata Database (i.e., Metabase) is a database for all Policy and Procedure Specifications.
- This seminar is all about a strategy for Data Interoperability. One based on metadata, which are the specifications of an Enterprise's Persistent Policies and Procedures.

2.0 What is Data Interoperability



Interoperability Requirements		
Connectivity Based	**Versus**	**Understanding Based**
Parse-able Common Formats Persistence Reliability Robustness Timeliness		Composition and Derivation Agreement Data Name and Name-Part Mapping Data Type Mapping Definition Agreement Granularity Agreement Precision Agreement Scale Agreement Value Domain Mapping
Basis–Exchange: fixed strings, "delimited" or Tag-based (e.g., XML)		**Basis–Definition**: Top-down standardization, Community of Interest consensus, External Standards Adoption
Connectivity Interoperability	**is not the same as**	Understanding Interoperability
I hear you		I understand you

If you don't have a Metadata Infrastructure you cannot have data interoperability. Why? Because there will be no "I understand you infrastructure."

The Key Take Away is:

- Connectivity Interoperability is **not** the same as Understanding Interoperability else interoperability would have been solved with the "Telegraph."
- You can have Connectivity Interoperability without Understanding Interoperability.
- You must have Connectivity Interoperability along with Understanding Interoperability to then have Total Interoperability.
- XML **alone** is not a solution.
- XML without a Metadata management infrastructure is just "I hear you."

Data Interoperability, then... The ability to exchange data between two or more agents without loss of precision or semantics, within acceptable limits for latency (timeliness), complexity, and cost.

3.0 Data Interoperability Errors

Type I Error: An error which occurs when a true hypothesis is rejected.

Hypothesis: Social Security Number Of Employee = Parent Social Security Number of Dependent

Rejection: Employee SSN is 9 integers (e.g, 123456789); Parent Social Security Number of Dependent (11 characters) is 3 integers, a hyphen, 2 integers, a hyphen, 4 integers. (e.g., 123-45-6789)

Other Examples:

1. **0 and 1 for Gender**, and **1 and 2 for Gender**. (Value domain mismatch)

2. Mike Gorman vs Michael M. Gorman (Same person, different names errors)

3. Generalized table for valuables (Valuables: ValuableType, Name, Value) vs RealEstate Table, or Jewelry Table, etc. (Data structure mismatches)

Type II Error: An error which occurs when a false hypothesis is accepted.

Hypothesis: Sales East = Sales for March of NE Division +
Sales of March of SE Division

Acceptance: Sales March of NE Division is Net After Expenses Sales
Sales of March of SE Division is Total Monthly Sales

Other Examples:

- 1 for Gender = Female, and 1 for Gender = Male. (Value meaning mismatch)
- Michael Gorman vs Michael Gorman (Same name, different persons error. 1 born 1941, other born 1965 (Sears!))
- Generalized table for valuables (Valuables: ValuableType, Name, Value) vs RealEstate Table, or Jewelry Table, etc. (Data structure mismatches). In the first structure, all valuables were Totaled. In the second, only those that fit tables were known and Totaled.

Complexity and Latency

- Time and effort to sort through similar data that is different and vice versa.
- Time and effort to synchronize granularity, units, precision and reference data codes and meaning.
- Time to find and gather all “right” data for mission

4.0 Data Interoperability Infrastructure

- Frameworks and Metadata Products
- Essential Information Technology Components
  - Enterprise Identifiers
  - Authoritative Data Sources
  - Information Exchange Standard Specifications
  - XML Data Transport
- Metadata Repository
  - Characteristics
  - Key Meta Models
  - Implementation Alternatives

4.1 A Framework for the Knowledge Worker

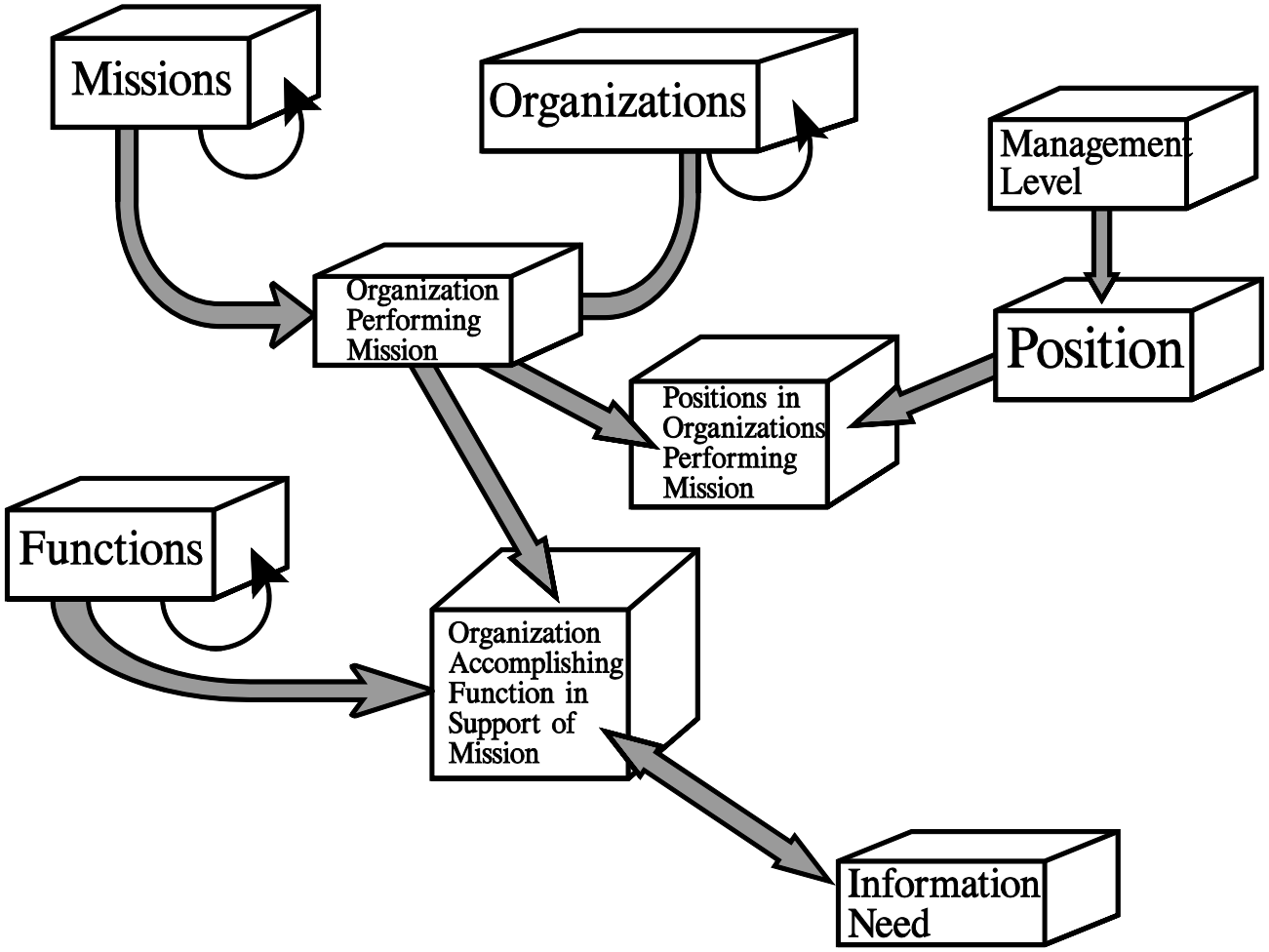
		Man-Machine Interface				
		Machine		Interface	Man	
Deliverables	**Mission**	**Database Object**	**Business Information System**	**Business Event**	**Business Function**	**Organization**
Scope	Business missions	Major business resources	Business information Systems	Interface events	Major business scenarios	Organizations
Business	Mission hierarchies	Resource Life Cycles	Information sequencing and hierarchies	Event sequencing and hierarchies	Business scenario sequencing and hierarchies	Organization charts, jobs and descriptions
System	Policy hierarchies	Specified data models and Identified Database objects	Information system designs	Invocation protocols, input and output data, and messages	Best practices, quality measures and accomplishment assessments	Job roles, responsibilities, and activity schedules
Technology	Policy execution enforcement	Implemented data models and Detailed Database Objects	Information systems application designs	Presentation layer information system instigators	Activity sequences to accomplish business scenarios	Procedure manuals, task lists, quality measures and assessments
Deployment	Installed business policy and procedures	Operational data models	Implemented information systems	Client & server windows and/or batch execution mechanisms	Office policies and procedures to accomplish activities	Daily schedules, shift and personnel assignments
Operations	Operating business	Application Interface data model	Operating information systems	Start, stop, and messages	Detailed procedure based instructions	Daily activity executions, and assessments

Knowledge Worker Framework Relationship to IT System Errors (GAO Studies)

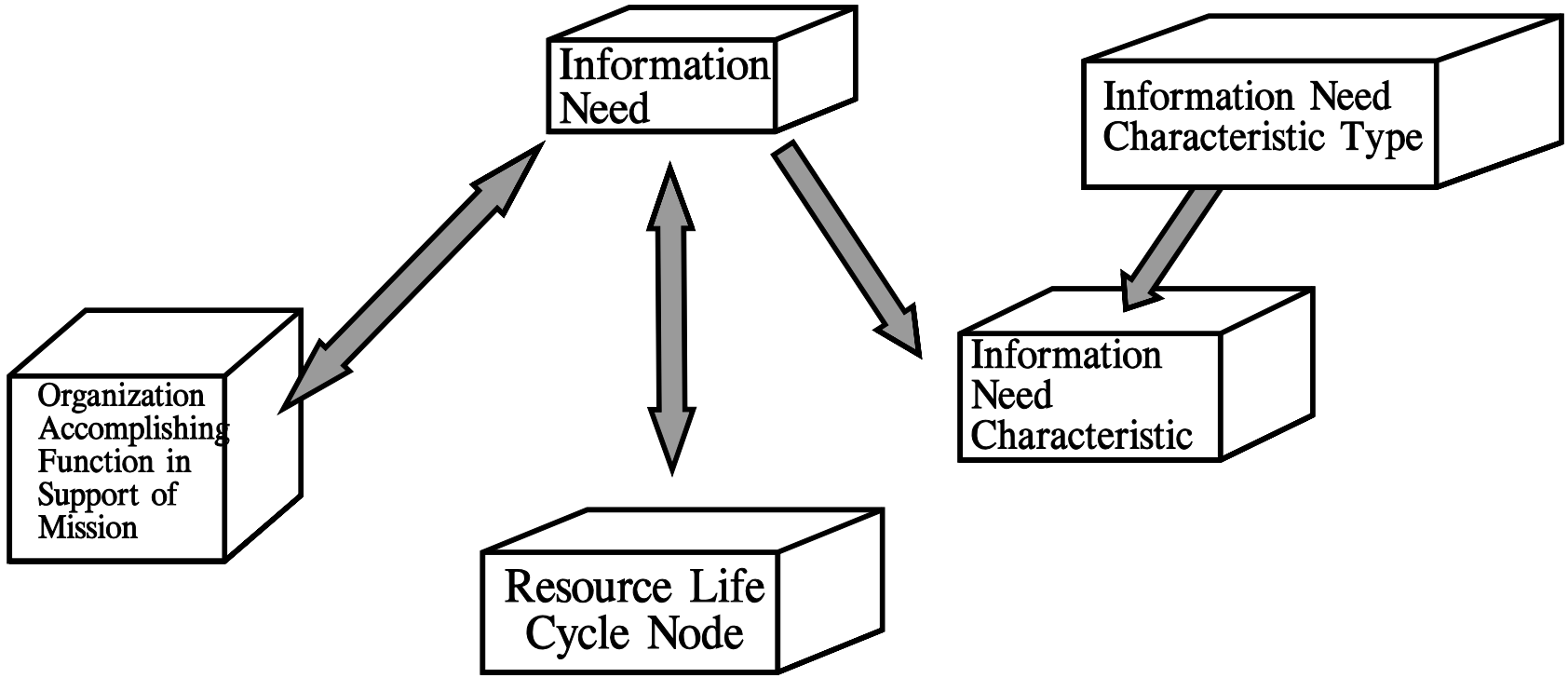
Knowledge Worker Framework						
		Machine		Interface	Man	
	Mission	Database Object	Business Information System	Business Event	Business Function	Organ-ization
Scope	5	2	3	1	3	4
Business	5	3	2	1	6	6
System	3	**2**	**2**	**1**	12	8
Technology	1	**0**	**0**	**0**	8	6
Deployment	0	**0**	**0**	**0**	5	5
Operations	0	**0**	**0**	**0**	3	3
Col. Totals	**14**	**7**	**7**	**3**	**37**	**32**

Note: All numbers expressed as Percent allocations of errors ...12 Gray cells are IT.
All errors from IT system failure are addressed.
This leads us to know what to collect.

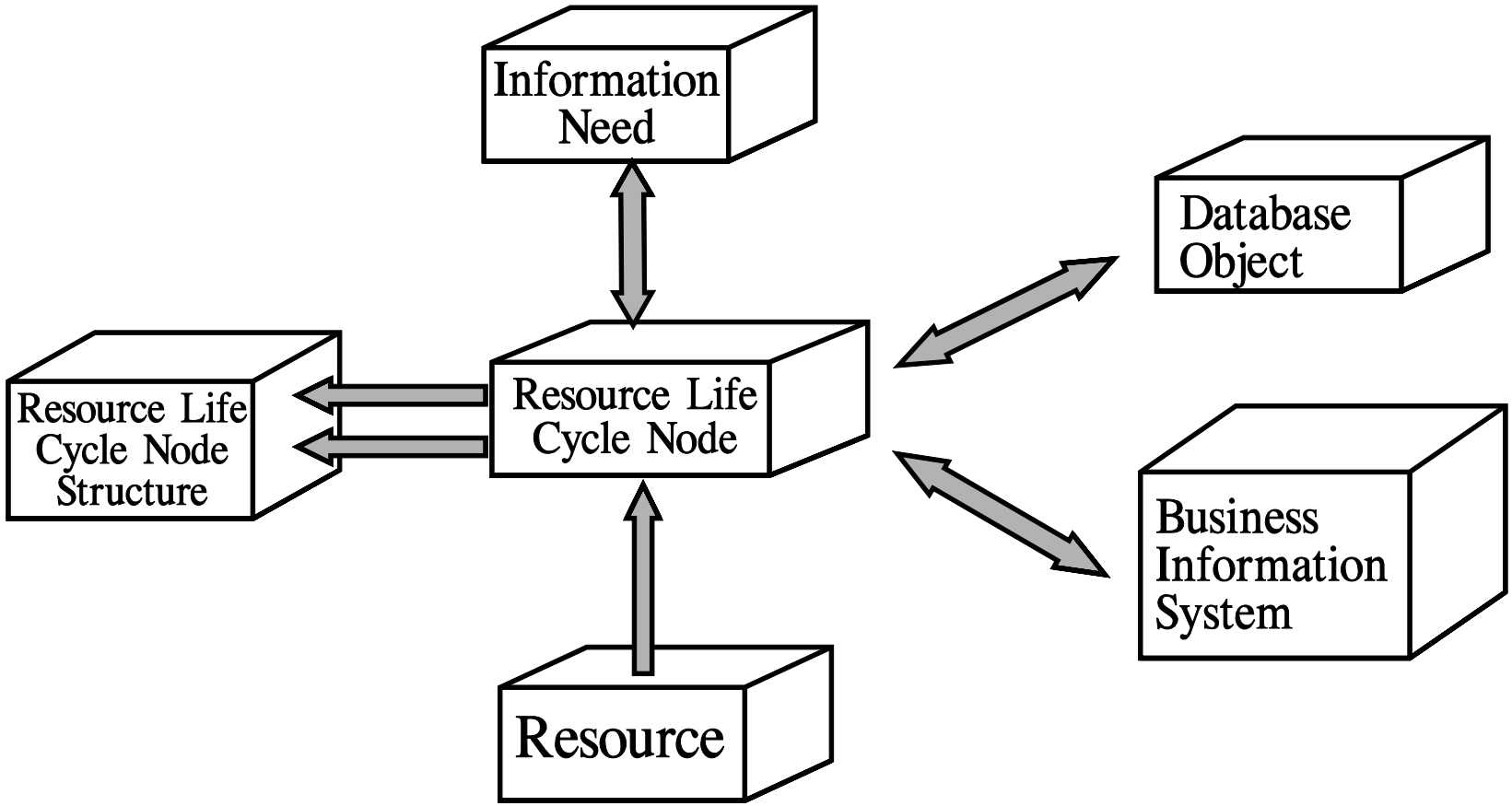
We must therefore collection: Mission, Organization, Function and Position



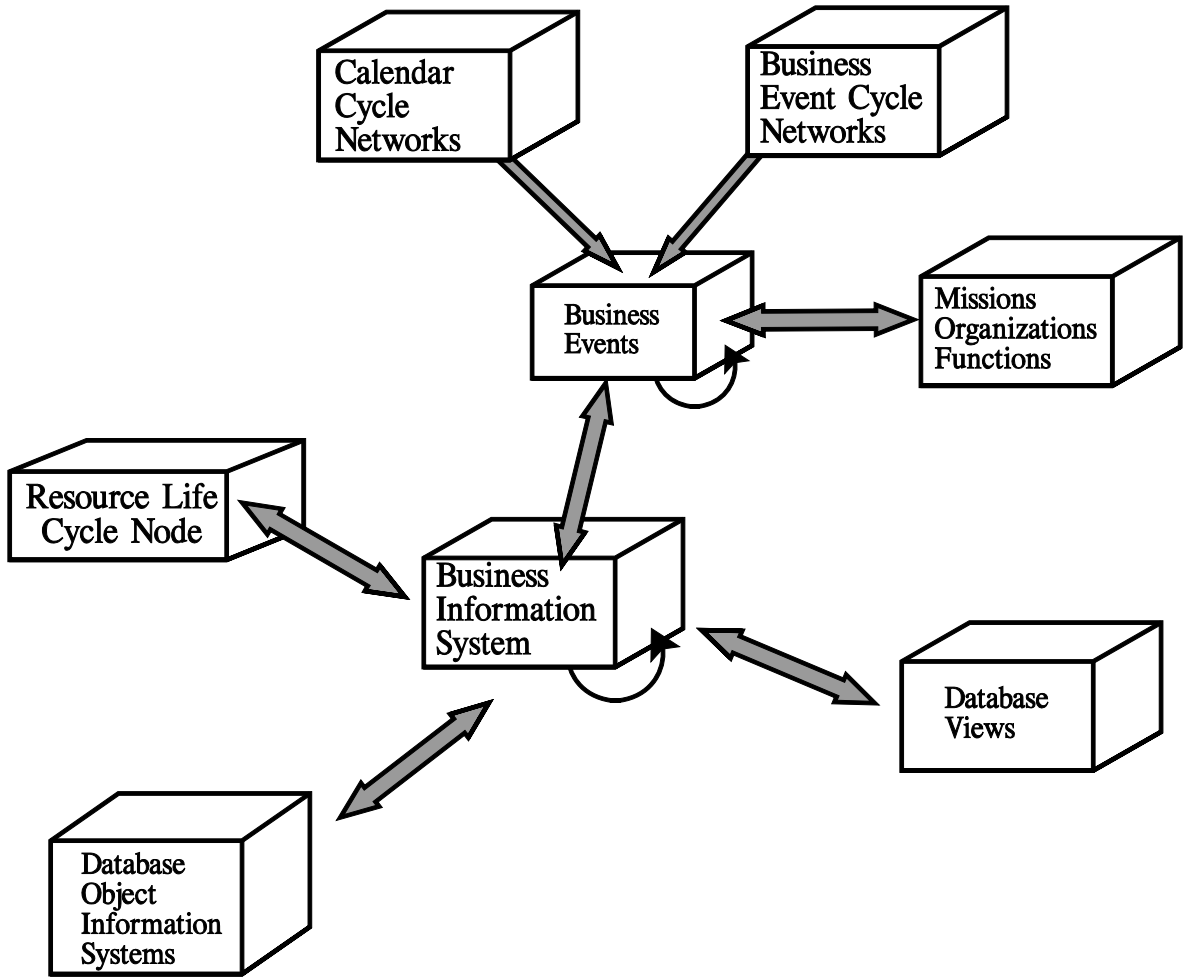
And Information Needs to then support our functions performed by organizations as they accomplish missions.



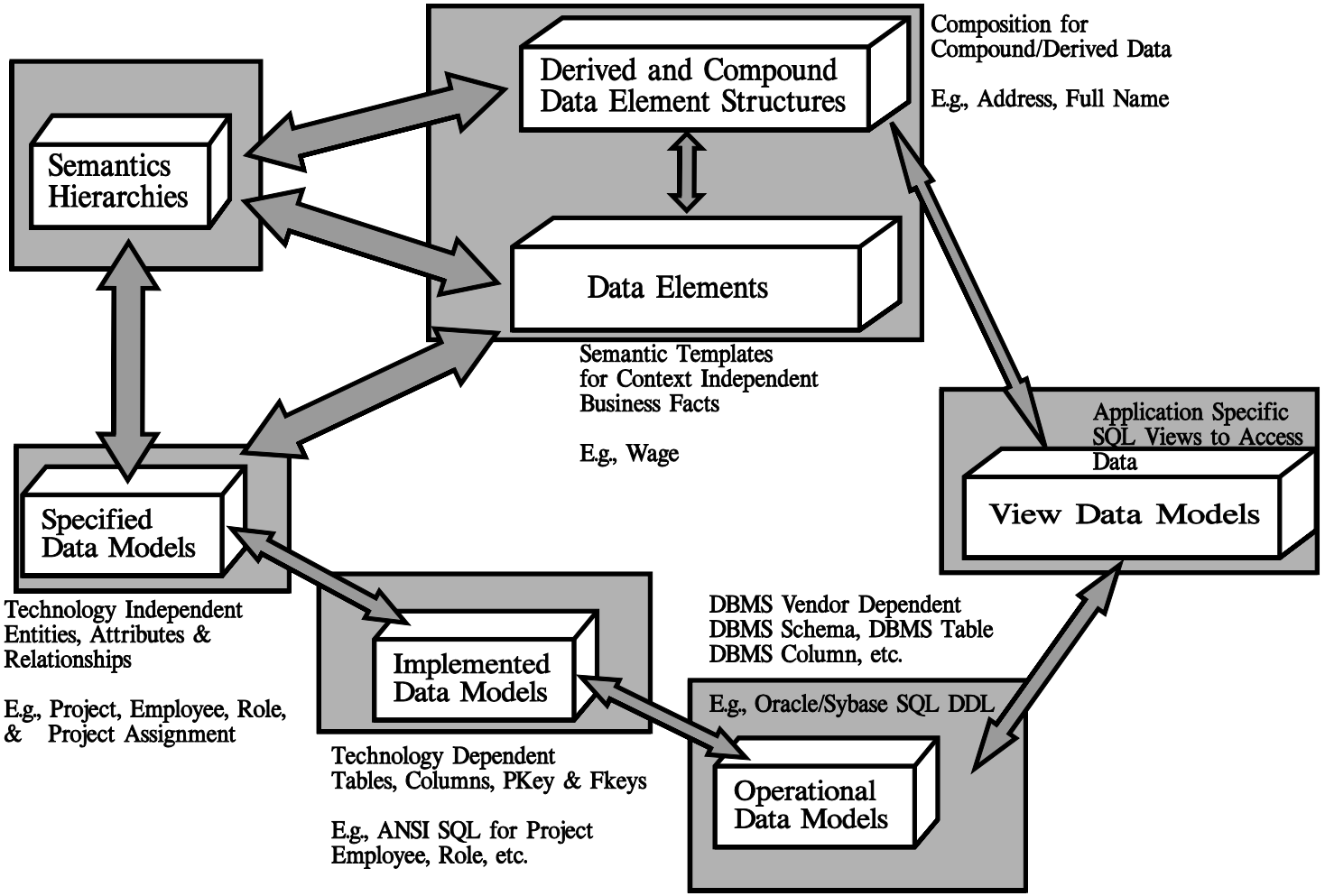
And know we'll know how our information needs are "produced." that is, what databases and information systems within which Resource Life Cycle Nodes satisfy which Information Needs...



And the Resource Life Cycle Nodes are "IT" supported by : Business Information Systems and Business Events that exist within calendars and cycles...



And finally, the structure and organizations of all the necessary data models

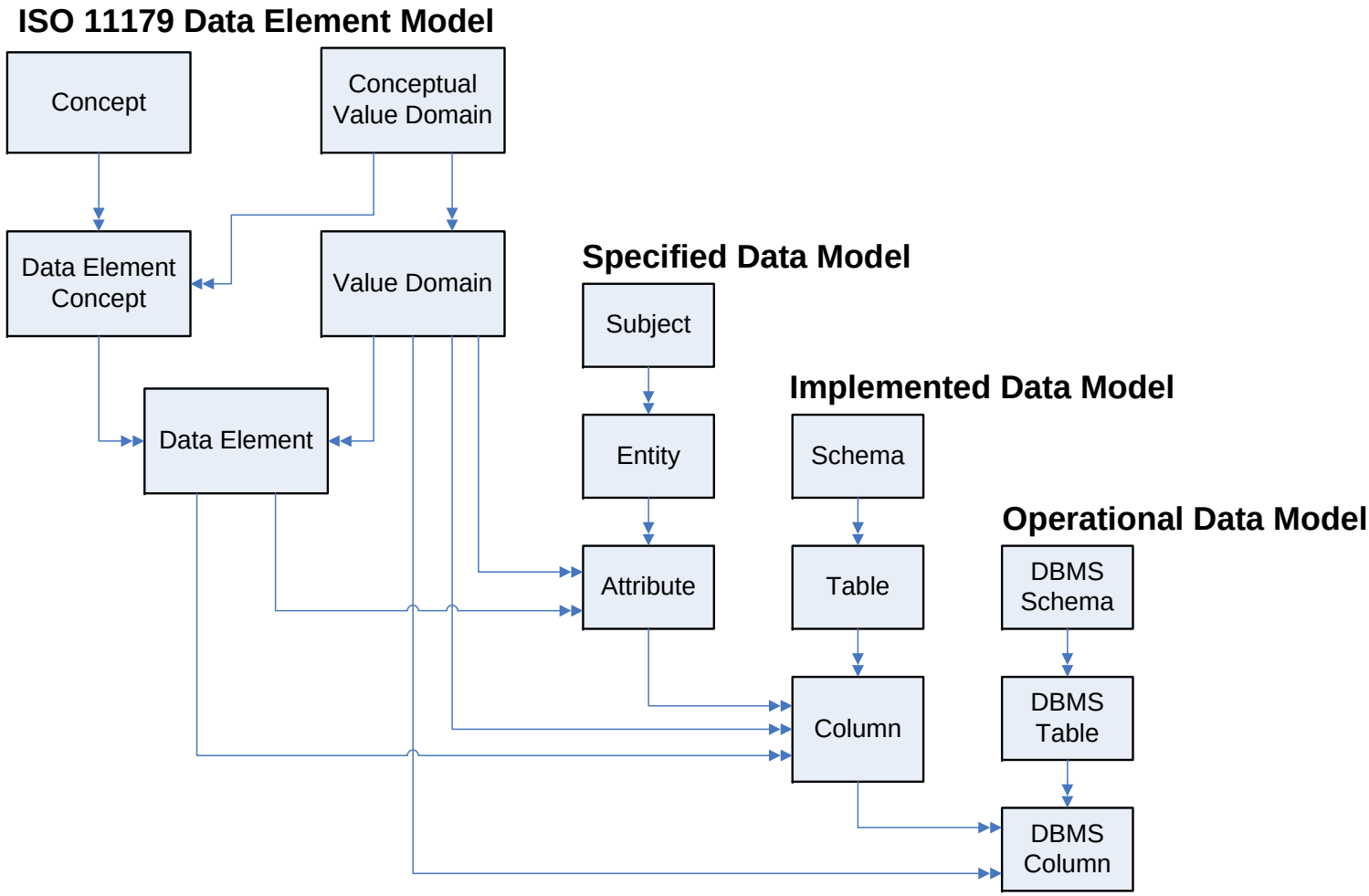


Why Whitemarsh Doesn't Just Use Conceptual, Logical, and Physical...

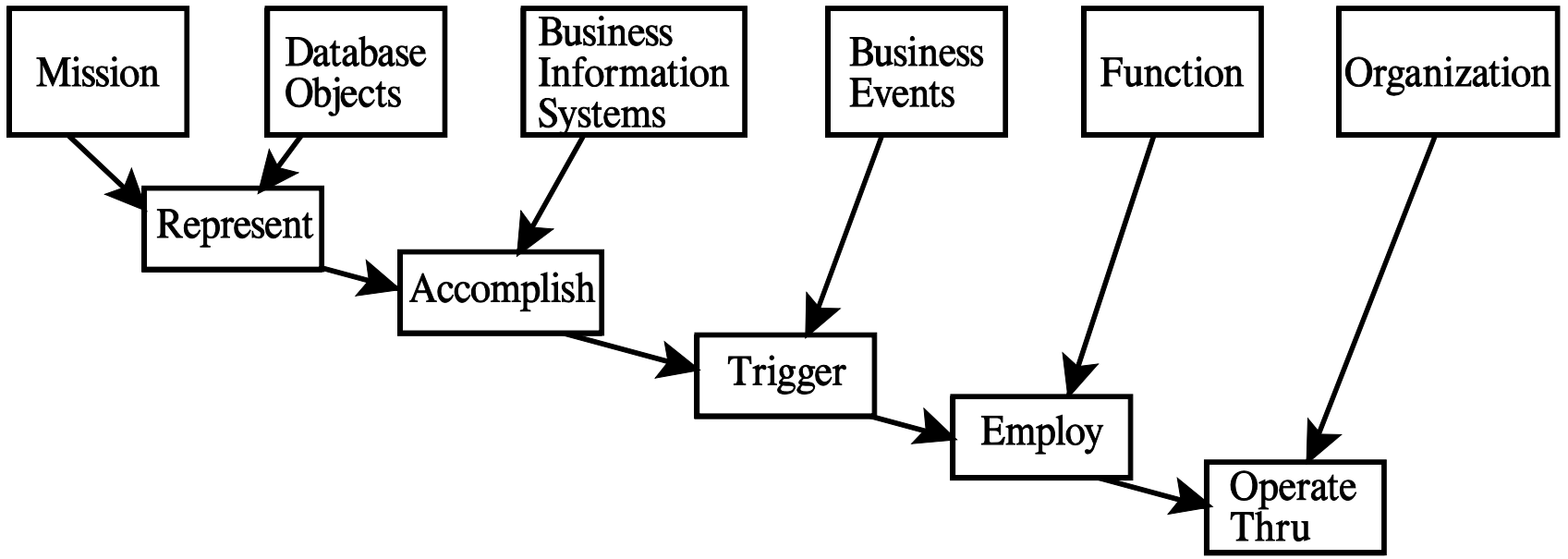
- There are no crisp, accepted-by-all definitions of *Conceptual*, *Logical*, *and Physical*
- Just observe discussions on DM-Discuss (a Yahoo group), or ask Agile/UML folks.
- Terms and definitions within *Conceptual*, *Logical*, *and Physical* are muddled, overlapping, and ambiguous. Data element is often synonym for column.
- Everybody just ignores ISO 11179 data elements.

So... Whitemarsh uses *Data Elements*, *Specified*, *Implemented and Operation* which are clearly defined, precise, unambiguous, and not overlapping.

Whitemarsh Data Architecture Reference Model



These Meta Models Tell a Story...These six models are non-redundant, independent through many to many relationships, and integrated across the KWF Framework, and down through its rows of unfolding specification, implementation, deployment, evolution and operation.



All these models can be:

- Build bottom up
- Top down
- Independently and then interrelated

Suggestion...

Build Strategy	Model
Top-down	Mission, Organization, Function, Information Needs, Resource Life Cycle, Data Element Semantics (Concepts, Conceptual Value Domains, Data Element Concepts)
Bottom Up	Operational, Implemented, Specified, Data Elements, Value Domains
Maintenance	Put on critical path of every project.

4.2 Information Technology Components

- The IESS (Information Exchange Standard Specifications) gives us our data models for sharing data.

- The ADS (Authoritative Data Sources) gives us our source for truth, accuracy and precision.

- The EID (Enterprise Identifiers) gives us the ability to track critical assets throughout their life span in all involved activities and services.

- XML enables us to exchange data in formats that are not proprietary to either sender or receiver.

A key question left is:

Where and how do we store all our metadata (i.e., specifications and interrelationships) about all these things?

4.3 Metadata Repository

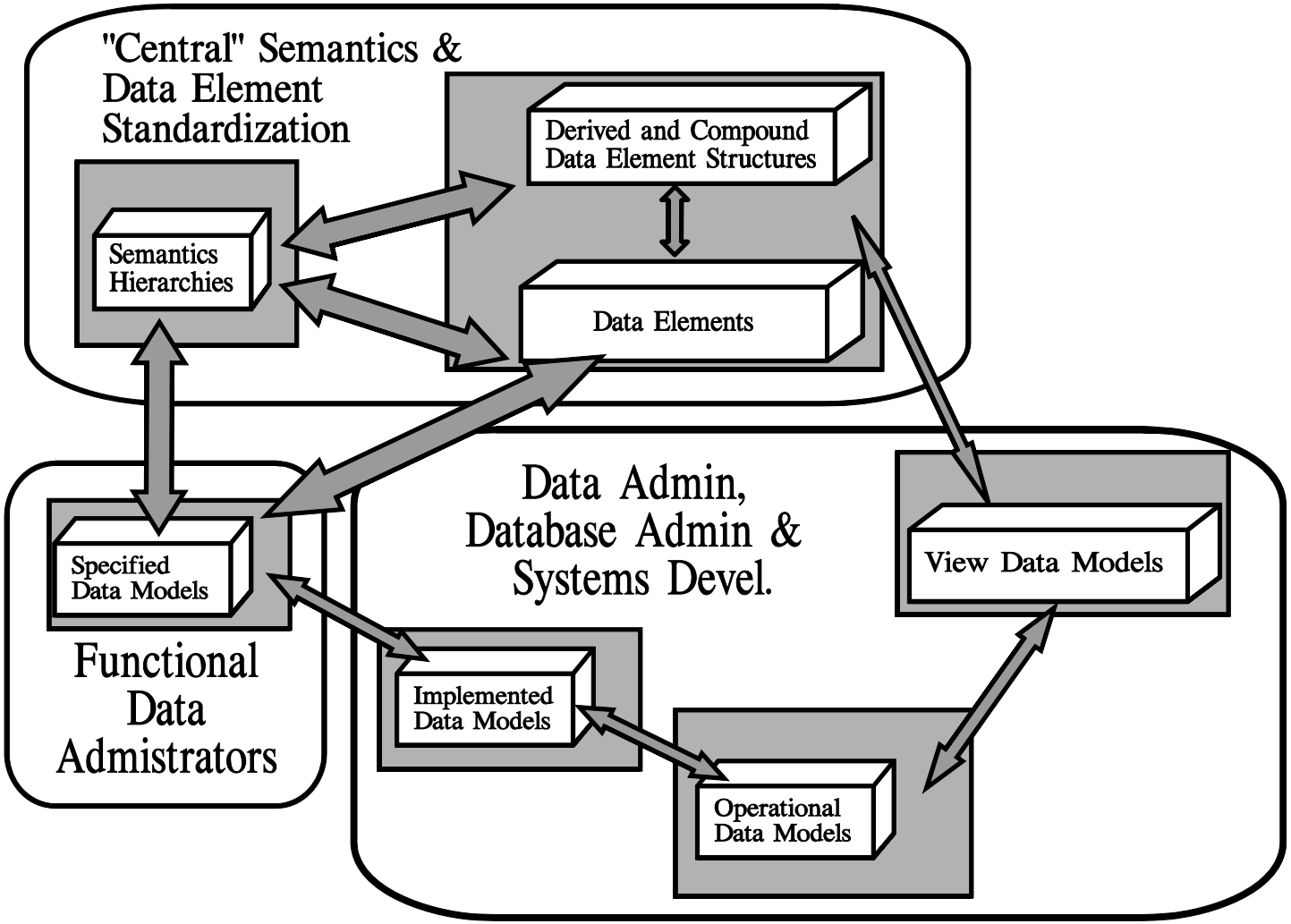
A metadata repository is just a database wherein the data is all "metadata."

- The data architecture is just a schema of tables and columns of metadata types
- The application architecture is just systems of "CASE" (**C**omputer **A**ided **S**ystem **E**ngineering) like processes
- The technology architecture is just your garden variety SQL engine, presentation layers, diagram makers, and report writers.
- Buying a metadata repository is faster, but then you're buying somebody else's design and your critical metadata may be trapped in "secret structures."
- Building a metadata repository is slower but then you have what you want and need, and the metadata is likely in open-access structures.
- Buying a template based Metadata Repository and then evolving to what you need is preferred and the metadata can be in open-access structures.

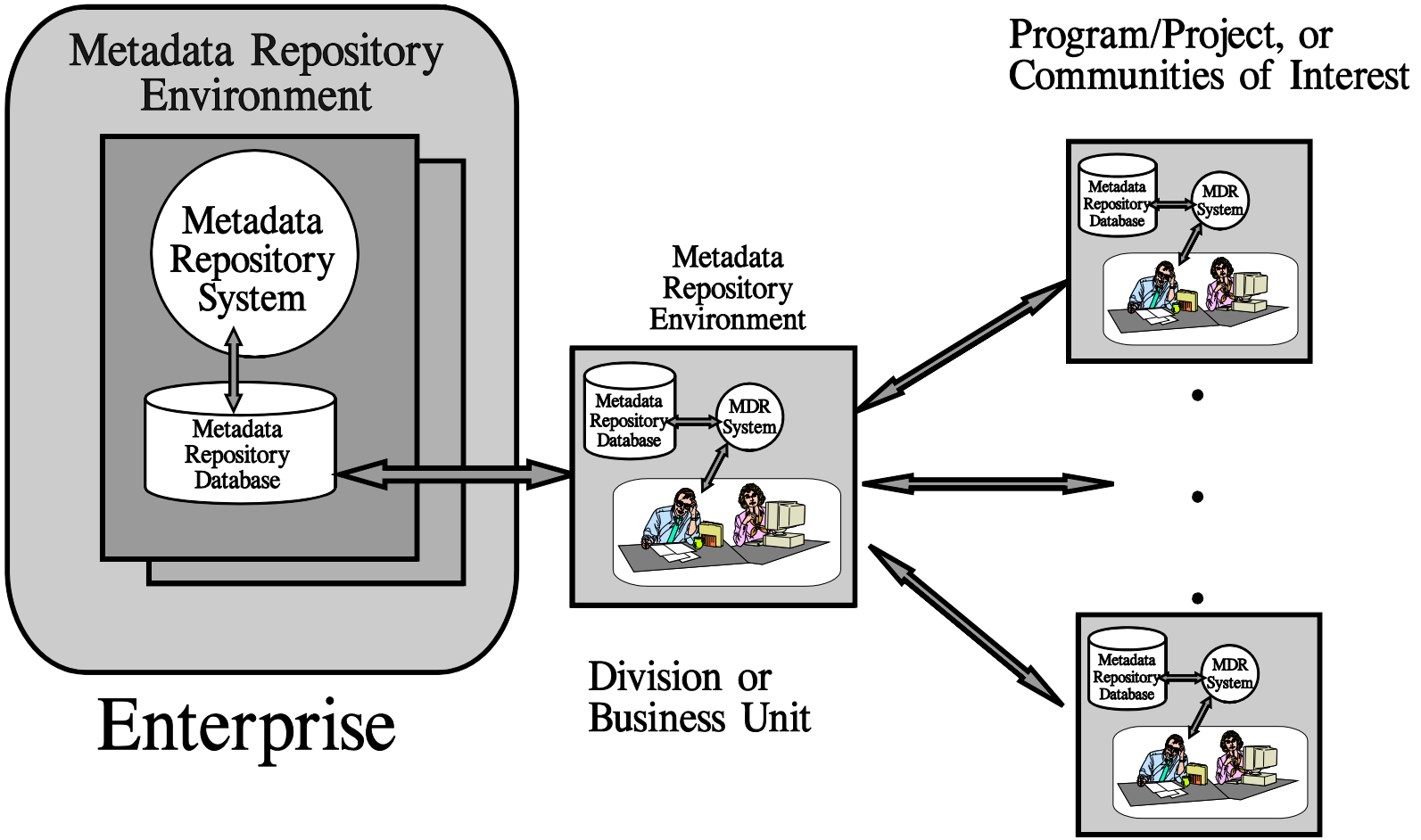
What is the Scope of the Metadata Repository

Knowledge Worker Framework						
	Mission	**Database Object**	**Business Infor-mation System**	**Business Event**	**Function**	**Organ-ization**
Scope	**To be successful at Knowledge Worker Management, all rows and columns must be integrated through:** • An overall metadata model • Methodology or work breakdown structure to move intra and inter-cell • Metrics to predict the effort for small to large projects • Deliverable specifications supported by objective quality control measures					
Business						
System						
Technology						
Deployment						
Operations						

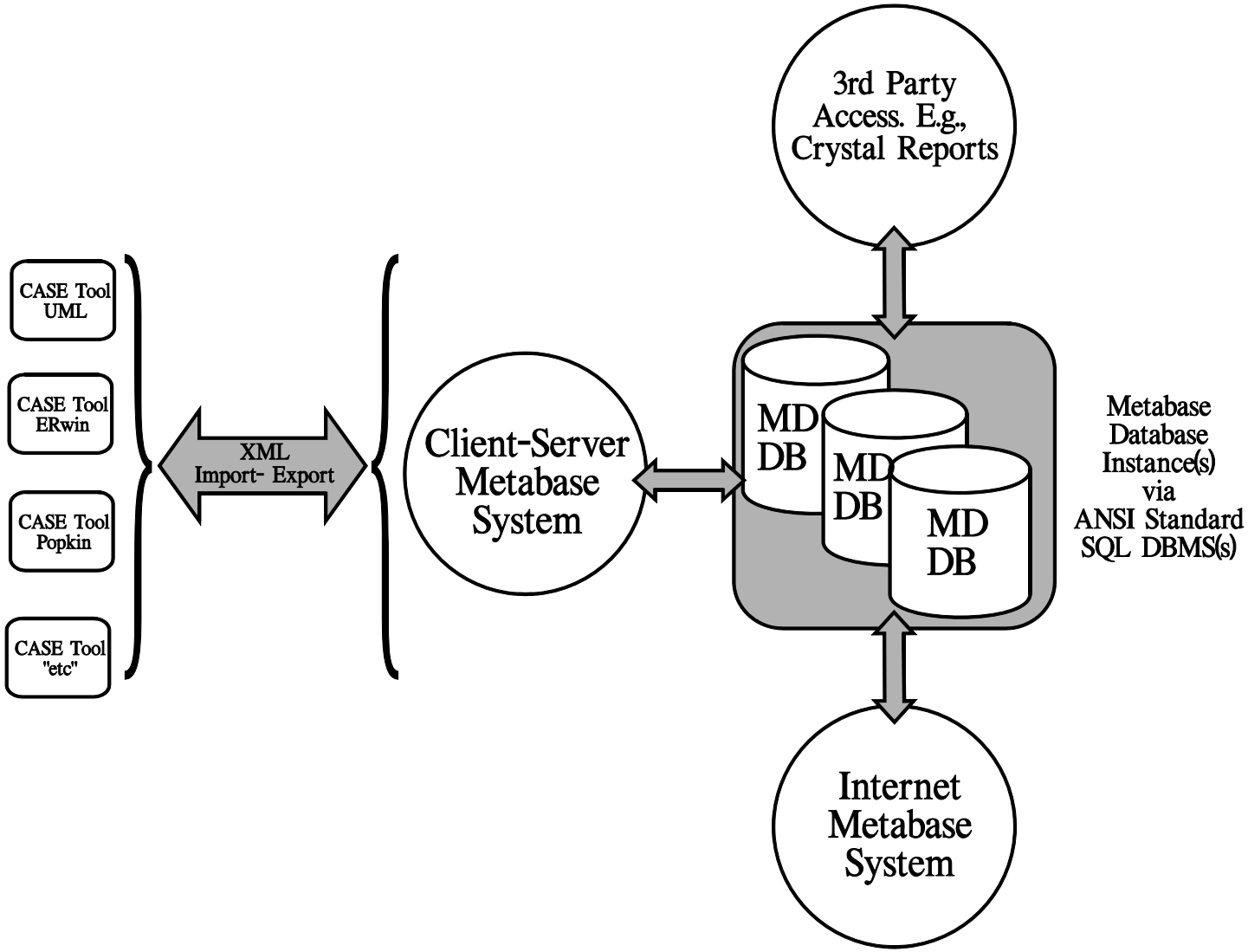
Functional Distribution of "Data Model" Metadata



Distribution of Metadata



Metadata System Architecture



5.0 Data Interoperability Governance

- Data Interoperability Program Infrastructure
  - ♦ Program Committee
  - ♦ Finance Board
  - ♦ Procedures Board
  - ♦ Standards Policy Board
  - ♦ Standards Development Board
  - ♦ Study Groups

- Community of Interest Infrastructure
  - ♦ Community of Interest Committee
  - ♦ Operational Technical Committee
  - ♦ Systems Engineering Technical Committee
  - ♦ Data Modeling Technical Committee
  - ♦ Test and Evaluation Technical Committee
  - ♦ Configuration Control Technical Committee

Good Governance and Dilbert are Inversely Proportional

- Governance Processes and Components have to be Win-Win, else it's a Lose-Lose
- Building Data Interoperability Infrastructure involves many things from communities of interest, metadata products and systems, and knowledge transfer through methodologies, presentations, workshops, etc.
- Communities of Interest are key because they represent policy boundaries within which shared data is found. Between which some data can be exchanged.
- The data interoperability key processes are building enterprise architectures, information systems plans, reverse engineering and forward engineering
- Creating metrics and assessing progress is critical on the road to data interoperability success.
- Knowledge transfer is critical. Buying already developed wisdom and then evolving it is much cheaper and preferred to "Reinventing the Wheel."

6.0 Data Interoperability Scenarios

- **Building and Employing Enterprise Architecture Models**:
  Scope and Business Rows, all columns. About 41% of all GAO IT errors.

- **Creating and Evolving Information Systems Plans**:
  System Row, all columns. About 8% of GAO IT errors.

- **Architecture and Engineering of Data Models**:
  Technology Row, database object column. Less than 2% of Errors

- **Performing Reverse Engineering of Legacy Systems and Databases**:
  Operations, Deployment, Technology and System Rows. Database Objects Column.
  Less than 2% of Errors

- **Forward Engineering Manufacture of New Systems and Databases**:
  Operations, Deployment, Technology and System Rows. Database Objects Column.
  Less than 2% of Errors

- **Employment Errors**:
  Systems through Operations Rows. Operations and Functions Columns.
  About 49% of Errors.

Distribution of Workshops Across Knowledge Worker Framework

<table>
<tr><th colspan="7">Knowledge Worker Framework</th></tr>
<tr><th></th><th>Mission</th><th>Database Object</th><th>Business Infor-mation System</th><th>Business Event</th><th>Function</th><th>Organ-ization</th></tr>
<tr><td>Scope</td><td colspan="6" rowspan="2">Enterprise Architecture Workshops</td></tr>
<tr><td>Business</td></tr>
<tr><td>System</td><td colspan="6">Information Systems Planning Workshops</td></tr>
<tr><td>Technology</td><td rowspan="3">Post Imple-menta-tion</td><td rowspan="3">Reverse and Forward Engineering Workshops</td><td colspan="2" rowspan="3">Accomplished by IT after systems and database are defined</td><td colspan="2" rowspan="3">Post Implementation Efforts to change enterprise to take advantage</td></tr>
<tr><td>Deployment</td></tr>
<tr><td>Operations</td></tr>
</table>

6.1 Building and Employing Enterprise Architecture Models

- Missions, Organizations, Functions and Positions
- Database Domains
- Database Objects
- Information Needs Analysis

Notes:

- Fundamentally this strategy was invented by Matt Flavin (Infodata and Yourdon) in the late 1970s.
- Adopted and evolved by Steve Spewak (1980s).
- Adopted and evolved by Whitemarsh (early 1980s).
- Derived from NIAM (Natural-Language Information Analysis Method) by Nijssen and others. Conceptual "cousin" to Halpin's Object Role Modeling (1960s - 1990s).

6.1.1 Missions, Organizations, and Functions

Mission Workshop	
Objective	Identify the set of missions that frame the essence of the enterprise. The collection of missions should be the business, no fewer and no extra.
Steps	● Identify the key missions of the Enterprise. ● Describe each mission to the ultimate objective or business purpose. ● Factor out any "who" and "how." Non Factored causes "fights." ● Identify and describe the external missions and the infrastructure missions.
Time	Should only take two or three months for enterprise. Build from existing materials.

Cases:

(1) The entire enterprise is addressed. Good

(2) Only Infrastructure or External missions are covered. Acceptable

(3) Only partial Infrastructure or External missions are covered. Not good. You may miss critical sources of data, processes, functions, etc.

Organizations Workshop

Organization Workshop	
Objective	Identify and describe the organizations of the enterprise charged with executing the missions.
Steps	● Identify the organizations that are the source of database data. ● Describe the organizations composition, staffing and locations. ● Describe the organization. ● Do NOT describe the organizations' functions and/or processes
Time	Should only take two or three weeks for enterprise. Build from existing materials.

Cases:

(1) The entire enterprise is addressed. Good

(2) Only Infrastructure or External organizations are covered. Acceptable

(3) Only partial Infrastructure or External organizations are covered. Not good. You may miss critical sources of data, processes, functions, etc.

Functions Workshop

Function Workshop	
Objective	Identify and describe the functions (human processes) of the enterprise charged with executing the missions from within the context of organizations.
Steps	Identify the functions that are the source of database data. Describe the functional composition and steps. Describe the essential purpose of the function.
Time	About two staff months.

Cases:

(1) Essentially same function done differently. That's OK if not in conflict.
(2) Function has no nor requires any computer support. That's OK.
(3) Function has an embedded computer system processes. Error. Factor and recast.

6.1.2 Database Domains

Database Domains Workshop	
Objective	To identify and describe the data intensive areas necessary to fulfill the missions of the enterprise. Every mission leaf must have at least one database domain. *Database Domains are noun-intensive mission-leaf descriptions.*
Steps	• Cycle through all mission leafs. • Identify, name, and hierarchically describe each database domain. Nouns should lead to tables, database objects, and data elements. • Create entity relationship diagrams from database domains. • Don't worry about the granularity of the entities. • Merge ER diagrams, retain only database objects • Resolve same name different database object • Resolve different name same database object.
Time	One day per mission leaf. One day for the leaf ER model. Several weeks to merge, discover database objects and create final ER model diagram.

6.1.3 Database Objects

Database Object Workshop	
Objective	Identify the non-redundant set of database objects from across a set of "nouns" within the database domain diagrams.
Steps	1. "Triage" nouns into tables, data elements, or database objects. 2. Describe database objects 3. Identify and describe database object states 4. Identify and describe database object information systems for the states. 5. Check that all tables are addressed 4. If new database objects are discovered, adjust database domains, missions, organizations, and functions.
Time	Full specification of each database object should take only one week.

- A **table** is a collection of columns about some policy or aspect of a policy.
- A **database object** is a collection of tables that conform to the boundaries of a process. It contains data structure, table processes, database object information systems, and states.
- A **data element** is an essential fact used in one or more tables.

6.1.4 Information Needs Analysis

Information Needs Analysis Workshop	
Objective	Identify every key information need within mission area and fully describe each.
Steps	1. Identify an information need. 2. Analyze the information need. 3. Describe and categorize the information needs components. 4. Recast information need components into primitive and best form. 5. Associate information needs to mission-organization-functions 4. Cross check that every mission-organization-function is justified by an information need and every information need is required by a mission-organization-function.
Time	About 1 hours per Information Need

Cases:

(1) MOF without an information need. Error. Need to resolve and fix.
(2) Information need without an MOF. Error. Need to resolve and fix.

6.2 Creating and Evolving Information Systems Plans

- Resource Life Cycle Analysis
- Business Information Systems
- Create Information Systems Plans

6.2.1 Resource Life Cycle Analysis

Resource Life Cycle Workshop	
Objective	To Identify, describe, and determine the life cycles for the critical resources of the enterprise.
Steps	1. Identify Resources and enter into the Metadata Repository 2. For each resource, create Resource Life cycles and enter into Metadata Repository 3. For "enablement vectored" resource life cycles create interrelationships.
Time	About one week per resource. And about 2 weeks for all the enablement vectors.

Cases:
(1) Resources cannot be inferred from missions. Error. Find out what's missing and fix it.
(2) Missions infer resources not known or managed. Error. Find out what's missing and fix it.
(3) Cannot find organizations responsible for resources. Error. Find out what's missing and fix it.
(4) Cannot find functions responsible for resource transformation. Error. Find out what's missing and fix it.

6.2.2 Business Information Systems

Business Information Systems Workshop	
Objective	Identify, Describe, and Specify Business Information Systems. Specify View Data Models as interfaces to Operational Data Models.
Steps	1. Broadly identify and describe the various business information systems 2. Identify and briefly describe the subordinate business information systems to a level where views can be assigned. 3. Identify and assign the relevant database object information systems 4. Identify and assign the various views. 5. Set the business information systems within the context of business events 6. Set the business information systems within the context of business even cycles 7. Set the business information systems within the context of business calendars
Time	No more than about half-day per Business Information System

6.2.3 Information Systems Plans

Information Systems Plan Workshop	
Objective	Create an Information Systems Plan from DBOs, BIS, and RLCA
Steps	1. Allocate Database Objects and Information Systems to appropriate Resource Life Cycle Nodes 2. Create and Allocate As-is and To-Be Models to Life Cycle Nodes 3. Create "Delta" project Plans to close the gap between As-Is and To-Be 4. Execute the ISP Through Time
Time	Given 50 databases and 100 Information Systems, about six staff months.

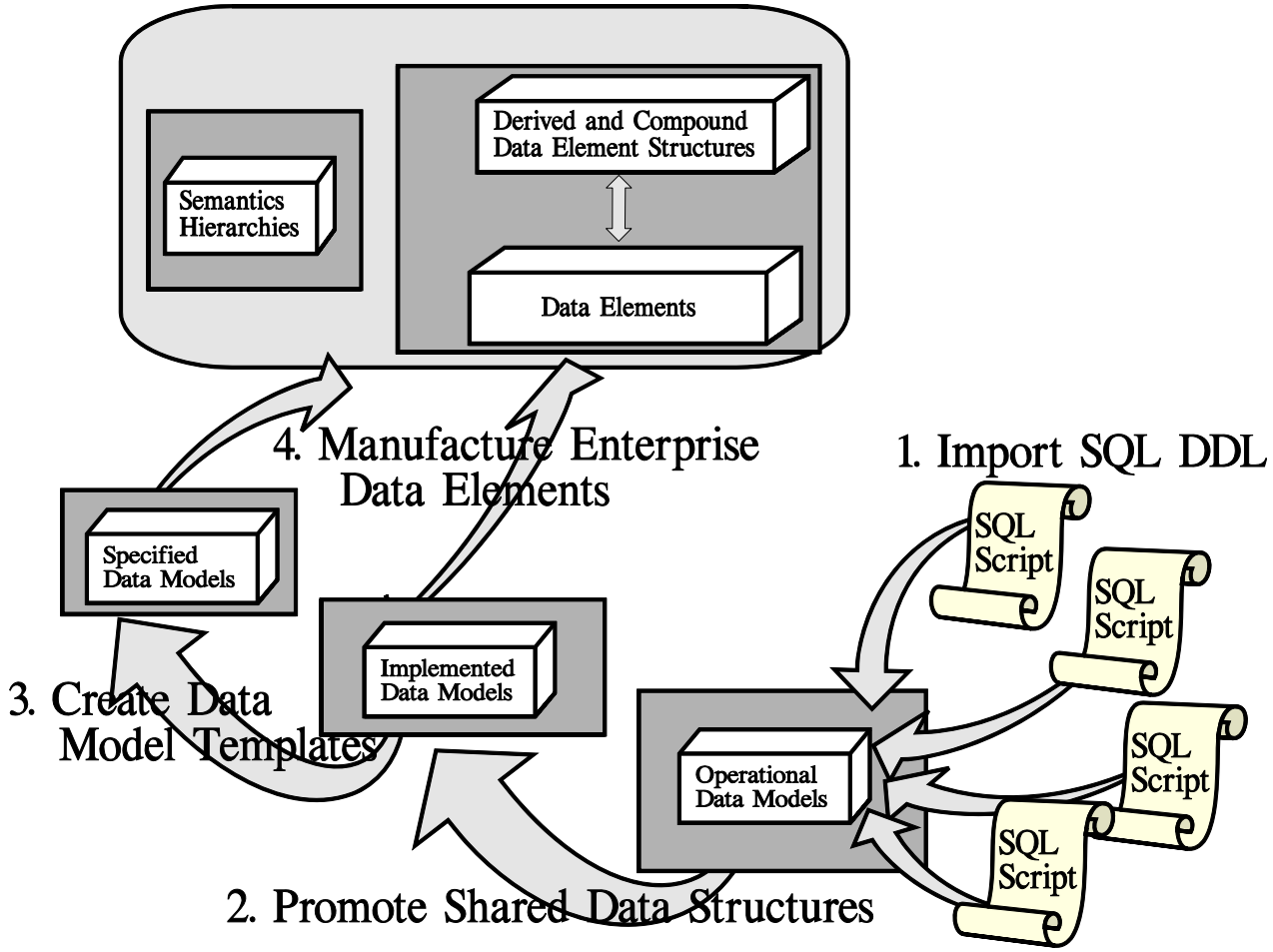
Cases:

(1) Many DB and BIS per RLCA Node. Good candidate for re-engineering

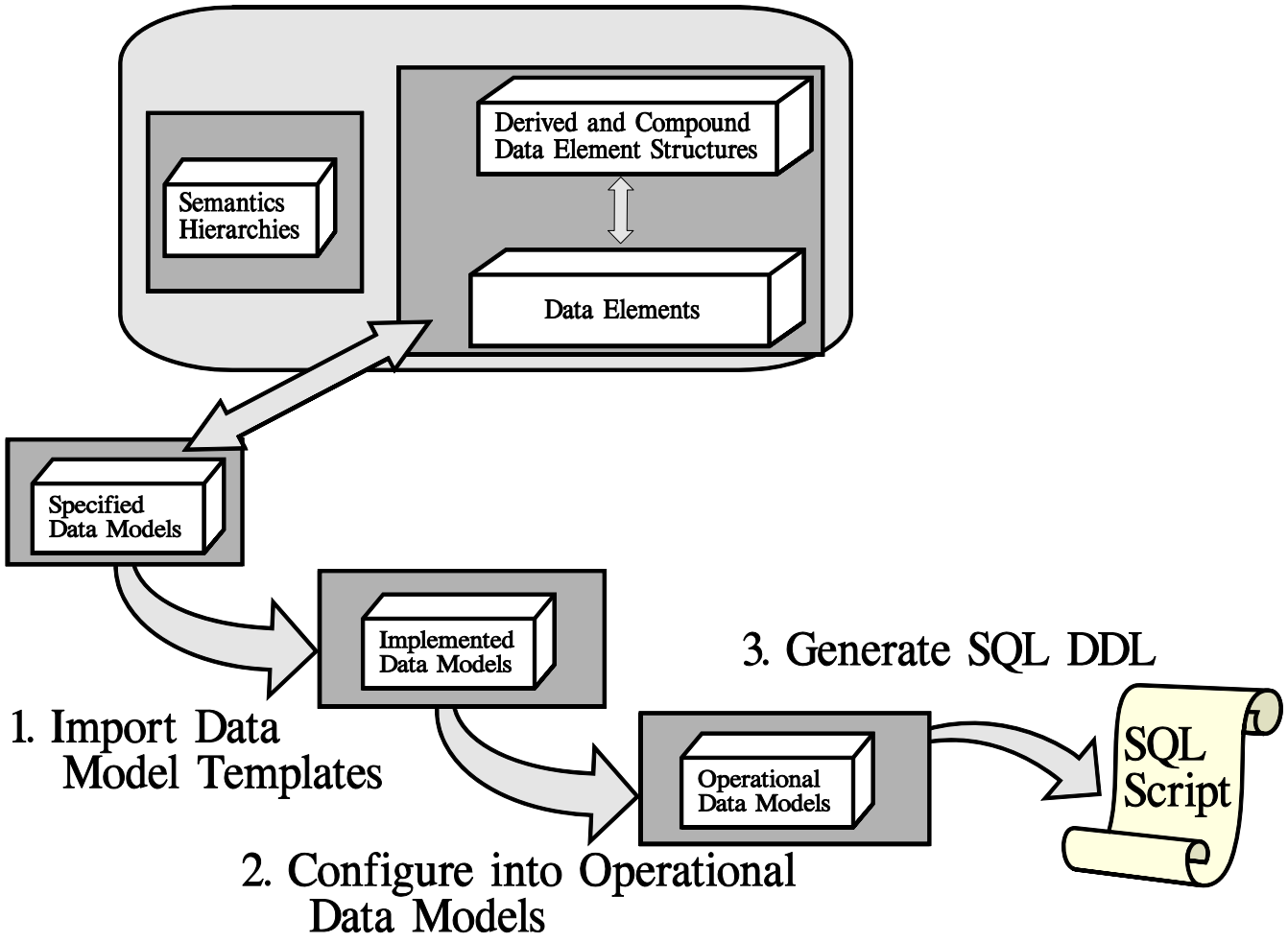
(2) No BIS nor DB on a Node. Possible error. How does node get transformed?

(3) Too long and too much money (100% probable). Adjust technology. Adjust designs.

6.3 Reverse Engineering



6.4 Forward Engineering



6.5 SQL Generation and Application Generation

SQL DDL Generation Workshop	
Objective	Generate a SQL Schema for a particular ODM. Import into DeZine and display the data model.
Steps	1. Pick the Schema 2. Pick the output file 3. Generate the SQL DDL 4. Display the generation 5. Import the SQL DDL into ER Modeler and display diagram 4. Use SQL DDL as appropriate
Time	Each SQL DDL generation should only take 10 to 15 minutes.

6.6 Data Interoperability Scenarios Summary

Scenario	Description or Use
Enterprise Architecture Models 41% of all GAO IT errors.	Provides the overall context within which all data interoperability is created. Critical. Enables Information Systems Planning, Data Architectures, and all productive reverse and forward engineering
Information Systems Plans 8% of GAO IT errors.	Provides the ability to know what to do, when to do it, and a transformation map from As-Is to To-Be. Provides business basis for project sequence.
Data Architecture Reference Model <2% of GAO IT Errors.	Provides "technical" structure for capturing data model metadata. Provides architecture for having a define-once, use many-times approach. Provides basis for semantics standardization.
Reverse Engineering <2% of GAO IT Errors.	Enables new models and structures to be founded on a strong, legacy-based foundation. Causes the bottom-up build of the metadata critical to forward engineering.
Forward Engineering <2% of GAO IT Errors.	Causes new models to be built with a fraction of the resources and in a fraction of the time. All new models are standards-based and support data interoperability from the very start.

7.0 Key Measures of Return on Investment

Measure	ROI	Way to Measure	Cost Savings
Cost to develop Data Elements	Hard	Either use your existing metrics against new collections, or use industry metrics against your new collections	See Savings #1
Cost to develop Data Models	Hard	Either use your existing metrics against new collections, or use industry metrics against your new collections	See Savings #2
Cost to develop software applications	Hard	Measure the time and resources given modified processes and tools to create software systems	See Savings #3
Improve Answer Quality	Soft	Attempt to measure a greater consensus or a reduced quantity of discord in making decisions	
Improved Customer Support	Soft	Reduced complaints by customers, that end up being true that their accounts are not in order.	

Savings # 1: Consolidation, Non-Redundant Metadata ROI

Activity	Quantity	Cost via technique employed for definition
Starting quantity of columns/fields	19,000	$4.75 million
Elimination of closely named columns and fields reduced the quantity to	3,000	$1.06 million
Elimination of same concept but very differently named columns and fields reduced the quantity to	560	$200,000

Savings # 2: Data Model Development ROI

Quantity of Tables From estimate of a prototypical database	Average Columns per Table	Total Col-umns	Process Driven Approach (2 hours per)	Data Driven Approach (2 hours per table, and 1/30th 11179 Data Elements	
400	15	6,000	5.75 staff years	0.7 Staff years	**Cost Difference at $100 per hour**
		Cost	$1,200,000	$120,000	$1,180,000 in favor of data driven.

Savings # 3: System Development ROI

Quantity of Tables	Function Points Per Table	Cost Per Function Point	Type of Software	Total Cost	Cost Difference (in favor of data driven)
400 (If Data Driven)	80	$400	Information	$12,800,000	$43,008,000
1744 (If Process Driven (400 * 4.36)				$55,808,000	
400 (If Data Driven)	80	$1,000	Military	$32,000,000	$107,520,000
1744 (If Process Driven (400 * 4.36)				$139,520,000	

Estimates exclude hardware, computing infrastructure, travel, testing, documentation, evolution and maintenance.

8.0 Data Interoperability Summary

- Essential to achieve Data Management goals
- Approach and infrastructure has been proven and improved over 25 years.
- Metadata are the “books” of IT just as ledgers are the “books” of finance
- Quality metadata management is the “SOX” of IT (truth, integrity, and quality)
- The ROI from quality meta management is
  - Increased productivity: faster specifications, re-usable artifacts
  - Increased quality: consistency, integrity, authority, configuration management
  - Decreased cost: define once, use many times. Manufacturing databases and systems
  - Decreased risk: confidence based consistency. Proven through use and reus

If we have the resources to do IT Databases and Systems wrong, many times,

Don't We have the resources to do IT Databases and Systems Right, just one time?

Whitemarsh Website Links

The point of the link should be self-evident in the link's text.

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Data Interoperability Community of Interest Handbook

(http://www.wiscorp.com/printed_books.html)

This book was modeled after three very successful communities of interest from IT. This is a very practical, day to day, engineering, construction and development guide for the creation of Data Interoperability Standards.

This 320 page book provides:

1) Rationale for Shared Data Environments across the Enterprise;

2) Blueprint for Collaborative Data Sharing;

3) Why Communities of Interest are Ideal Organizational Structures;

4) How Communities of Interest are Best Engineered;

5) Step-by-Step Strategies to Build Common Data Architectures;

6) Methodology & Plan to Create Focused Organizations;

7) Strategies for Meetings, Decision Making, and Voting; and

8) Much, Much More!