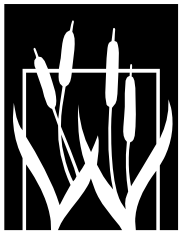

Whitemarsh
Information Systems Corporation

# Metabase System & Database Overview:
## Metabase Rationale, Knowledge Worker Framework, Business Case and Meta Model Diagrams.
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## Rationale for Metabase

*No one would ever question why a business needs it's finance books. Well, Metabase System's databases are the business's "Enterprise-Knowledge" books. If you cannot run a good business without the former, you cannot run your enterprise without the latter.*

**Note**: The word, Metabase, crafted from "metadata database," has been used by Whitemarsh since 1981 in reference to its many different versions of the Metabase System Whitemarsh built for its clients. These Metabase Systems were built through various database management systems such as Information Builder's Focus, CA's IDMS, and Cincom's Supra/Total.

The current Metabase System, as a commercial product, has been constructed through SoftVelocity Corporation's Clarion, which is a Business Information Generator.

The Metabase System is inherently multi-user, and operates concurrently over both IntraNets and Internets. The Metabase Databases are stored via SQL-engines including for example, Mimer and Microsoft's SQL Server.

By "Enterprise Knowledge" Whitemarsh means the specifications of the Enterprise's knowledge worker's work-products including those in IT.

There are a number features that characterize efficiently and effectively managed enterprises including:

- Knowledge of and excellent execution of the missions, organizations and functions of the enterprise.

- Correct specification, deployment, and employment of enterprise level policy specifications and adherence. Simply put this is through the data that represents the memory of policy executions over time.

- Efficient architecture, engineering, implementation, and evolution of the business information systems that carry out policy executions which, in turn, form the basis for the enterprise's operational, tactical, and strategic memory through which lessons of the past bring excellence to both today's activities and future strategies and plans.

- Accomplishment of project management excellence across all levels of the enterprise in an integrated, interoperable, and non-redundant manner in support of consistency and repeatability.

- Deployment of enterprise-wide governance through assessments and audits so as to ensure careful adherence to the missions, goals, objectives, policies, plans, and executions that are essential for today's successes and future advancements.

These are what the Metabase System and its databases are all about. These are all set within books, technical papers, user guides, courses, seminars, webinars, workshops and finally the Metabase System's software and databases.

The following is a brief example from the past: Y2K. A significant portion of the time and costs associated with resolving the Year 2000 problem was directly attributed to a lack of a quality metadata environment within information systems organizations.

The fact that one information system organization within an enterprise had virtually no Year 2000 problem while another organization within that same enterprise was running their information systems shop "24x7" to solve their Y2K problem was no accident. The former had a long history of metadata management and the later considered metadata to be a wasted overhead expense.

Vital to the metadata engineering to ensure database success is control over semantics. The controls are mainly in the area of the definitions that form the basis of the interfaces to standard processes

(e.g., computing net profit) and the standard data definitions (e.g., what does profit *mean?*).

It is not necessary, however, to control the interfaces to the *end user*. Just how a data entry screen or report looks to different people is immaterial so long as the enforced semantics (rules of meaning and usage) are the same.

In the development of large business information system projects and databases that deal with enterprise-wide, indispensable business functions, the generation of design requirements and the resulting information system architectures, engineering and specifications is seldom accomplished such that the resulting business information systems are timely, accurate, or complete. This is disastrous for the following three reasons:

- Only the momentous facts that are remembered are recorded.
- As systems are specified, the lower-level design details are redundantly developed, often in conflicting manners.
- As system components are maintained, the efforts are crippled because of the undocumented business knowledge that is essential to understanding the component.

Amelioration of these three important problems starts with organizations adopting formal methods for performing analysis and design. Formal methods are only measurably productive and repeatable if they are very detailed and proceduralized.

Such detail, however, dehumanizes knowledge workers, who, in turn, are certain to generate protests about being production workers on an assembly line, which, by the way, is worthwhile only when all of its products are the same.

In contrast, to the production line, business information system designs are unique assemblies of large collections of work products, many of which are similar in design.

Designing business information systems is not an activity for the production worker. Rather, it is an activity for a Knowledge Worker. While there is clearly procedure to both activities, designing a business information system requires individualized applications of creativity, human factors techniques, and rule making. Accordingly, requiring the robot-like use of a fully detailed methodology cannot result in responsive information system designs. Knowledge Workers are not production-line workers. Work plans for Knowledge Workers must be drawn from proven techniques against which metrics have been captured and honed over the years.

Building a business information system, once it is designed in sufficient detail, is largely a rote application of computer language coding. The software system employed to generate the largest quantity of source lines of code in the Metabase System is SoftVelocity's Clarion. Because of Clarion, 95% of the Metabase System's code lines are 100% correct on its first generation. That enables the Metabase System's developer to expend 100% focus on just the 5% that makes the Metabase System unique. That is, its overall business logic, database design, and the specially coded processes. The result of the Metabase's software generation through Clarion produces computer code that is competitive in performance to a human coded applications. There is, of course, no comparison between human coding costs and code generator costs.

To fully respond to the three problems cited above, knowledge workers must have the freedom to create their own analysis and design work products for data and processes within strictures dealing with format, time, quality, and resources. These work products are stored into Metabase System databases. These databases contain these work products in fixed formats and sequences, that, in turn, can be accessed by business information system generators (both human and computerized), such as SoftVelocity's Clarion to generate 95% of a data-drive business information systems. Because the generation is quick, a fully functional version of the business information system design can be live-tested a short time later. As design flaws are found,

the Metabase System's metadata can be changed and the business information system regenerated. *In short, this enables an interactive design process, in which both the Metabase System and its databases of work product specifications are the empowering agents.*

Traditionally, it is not uncommon to expend 20 percent of a total systems development lifecycle on requirements and design. The remaining 80 percent is expended on building, testing, and documentation. Once implemented, 500 percent more is spent over a system's lifecycle for changes, fixes, and evolutions, also in a 20/80 ratio. The overall total is 600 percent. If, with SoftVelocity's Clarion for example,, the 80 percent is reduced to effectively zero, then there must also be a profound reduction in the 500 percent systems lifecycle maintenance.

## Whitemarsh & Metabase System's ROI

While technical excellence is intriguing and even essential to possess, results to the "bottom line" of enterprise management is very much more essential to make a "business case" for adoption. There are seven "problem" areas, identified by a CIO of an very large Fortune 100 corporation, that directly affect the efficient and effective operation of knowledge-based enterprises. These seven areas were analyzed to determine if they could be "improved" through the application of Whitemarsh products and to also determine return on investments that have already been achieved through the use of Whitemarsh products including the Metabase System. The seven areas and their ROIs that can bring you immediate return are:

- Enterprise-wide project management (16:1)
- Information Systems Planning (5.9:1)
- Data-Centered Development & Management (28:1)
- Data Model Manufacturing (8.6:1)
- Business Information System Environments (7.7:1)
- Business Information System Manufacturing (2.8:1)
- Enterprise's Architectures Development

## Metabase Components

The Metabase System's functional components address work products dealing with:

- Business Information Systems
- Business Events
- Data Elements
- Database Objects
- Data Integrity Rules
- Deliverables Management
- Documents and Forms
- Enterprise Governance
- Implemented Data Models
- Information Needs Analysis
- Missions, Organizations, and Functions
- Operational Data Models
- Project Management
- Reports Management
- Requirements Management
- Resource Life Cycle Analysis
- Screen/Graphical User Interface
- Specified Data Models
- Use Cases
- User Acceptance Tests
- View Models

Figure 1 illustrates, at a high level, the overall work product capture and work flow.

## Knowledge Worker Framework

The Metabase System and its databases do not exist in isolation. It is the repository for the work products cited within the Whitemarsh

Knowledge Worker Framework that was specially designed for the Knowledge Worker. These work products and the Knowledge Worker Framework correlates very closely with the majority of the Federal Enterprise Architecture Frameworks.

Table 1 sets out the Knowledge Worker Framework. John Zachman, the inventor of an Information Systems Framework in the late 1980s, often says, "Someday, you are going to wish you had all those models, enterprise wide, horizontally and vertically integrated at an excruciating level of detail." That is easy to say, and may even be easy to believe, but is there any proof?

Figures 2 presents, at a summary level the percentages of projects that fail when the metadata inferred by the cell has not been created, employed and maintained. Simply put, yes there is proof to Zachman's admonition.

The importance of the Knowledge Worker Framework is that it not only sets out the increasing levels of detail for the work products, it identifies the overarching subject matter columns, and finally enables the presentation of failure consequences both horizontally and vertically. These failure percentages set out in Table 2 were determined from an examination of a number of $100 million very large U.S. Federal Government projects over a large range of years.

Table 2 presents these same columns, rows, and a more refined presentation of the failure percentages. Note especially that if there were zero percentages of failures in Information Technology, there would still be a 95% probability of overall project failure. Clearly, a thought to ponder.

## Work Product Value Measurements

Listed at at the end of this paper in support of the Whitemarsh Metabase System, the Knowledge Worker Framework, and the achievement of the ROIs associated with the "problem areas" cited by the Fortune 100 CIO  is a large collection of courses, books, methodologies, project management tools, and seminars. These are all geared to achieve four objectives:

- Increase productivity
- Increase quality
- Decrease cost
- Decrease risk

On every serious project the savings derived from Whitemarsh product use has exceeded their cost.

## Metabase System Functional Layers

At the start of this paper, five features that characterize efficiently and effectively managed enterprises the key characteristics of an efficient and effective enterprise were set out. These are graphically achieved through three unfolding layers of detail. The first, Figure 1, the highest layer, shows the encapsulating layers and also depicts the overall work flow.

Figure 3, the middle layer identifies out all the functional modules of the Metabase System which additionally indicates the scope of the work products addressed by that functional module.

Collections are set within encapsulating layers. Each functional module, for example, Mission, captures all the work products that specify the Missions Organizations and Functions of the Enterprise including their decomposition and interrelationships.

As shown in the diagram, all work products are managed through Project Management including Governance. Governance, in turn is employed to audit and assess, including the keeping of history of all work products starting with Requirements. Requirements, in turn address the entire suite of work products in such a manner that all work products are interoperable, integrated and non-redundant.

Within the blue are three classes of work products that address one or more of all the work products in the red section.

In addition to the collection of all the work products in encapsulating layers, these work products are set with a framework specially designed for the Knowledge Worker.

Figure 4 sets out the high level of interaction among the various

Knowledge Worker columns. That is, the Mission Model and the Database Objects are "required for the proper data-based representation of the accomplishment of one or more mission. Conversely, a Database Object may be needed to understand what needs to be accomplished in one or more Missions.

Figure 5 presents a diagram that describes the activities involved in the accomplishment of the various work products that are stored in the Metabase are essentially set out in the middle circle. The work products that end up as accomplished deliverables through these activities are really tasks within project management.

Whitemarsh's project management exists as collections of project, deliverable, and task templates that, when staffed and affected through work environment factors that are feed to a work plan generator. Because of the existence of the deliverable templates the resulting work products, due to the inherent relationships among all the work products, are interrelated, interoperable, and non-redundant.

## Enterprise Data Architecture Reference Model

One of the most important reasons why enterprise data is so important to correctly identify, engineer, and deploy is that enterprise data is not only employed in virtually every work product, but is also a common mechanism of interrelating all work products.

Figure 6 shows the major set of work products are shown surrounding the actual enterprise data models which are at the core of the diagram.

## Cross Referencing Metabase Functional Modules and the Knowledge Worker Framework

Table 3 presents a cross reference between the various Metabase System Modules listed in column 1 and the use of those Metabase System Functional Modules from within the columns of the Knowledge Worker Framework.

## Business Questions Addressed by the Knowledge Worker Framework Columns

Table 4, which starts on page 15 and goes to page 22 identifies the business questions addressed during the accomplishment of the work products identified within the columns of the Knowledge Worker Framework.

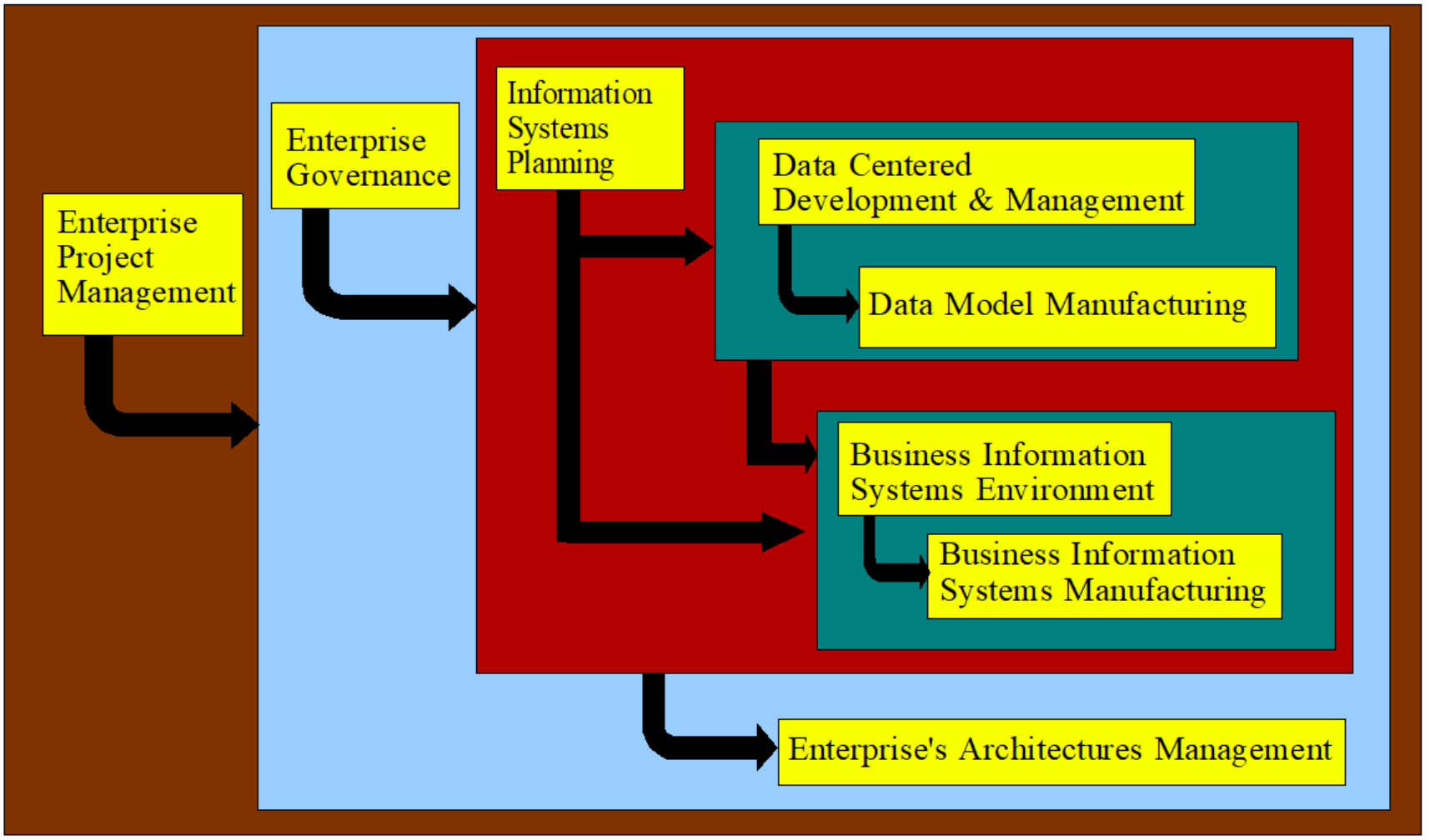



**Figure 1**. High-Level Enterprise Management Activities for Effective and Efficient Operation.

| Knowledge Worker Framework | | | | | | |
|---|---|---|---|---|---|---|
| | | Man-Machine Interface | | | | |
| | | Machine | | Interface | Man | |
| Deliverables | Mission | Database Object | Business Info System | Business Event | Business Function | Organization |
| **Scope** | List of business missions | List of major business resources | List of business information Systems | List of events | List of major business scenarios | List of organizations |
| **Business** | Mission hierarchies | Resource Life Cycles | Information sequencing and hierarchies | Event sequencing and hierarchies | Business scenario sequencing and hierarchies and use cases | Organization charts, jobs and descriptions |
| **System** | Policy hierarchies | Data Elements, 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 |

**Table 1. Knowledge Worker Framework.**

<table>
<tr><th colspan="6">Whitemarsh Knowledge Worker Framework</th></tr>
<tr><th rowspan="3">View Points</th><th rowspan="3">Mission</th><th colspan="5">Man-Machine Interface</th></tr>
<tr><th colspan="2">Machine</th><th>Interface</th><th colspan="2">Man</th></tr>
<tr><th>Database Object</th><th>Business Information System</th><th>Business Event</th><th>Business Function</th><th>Organization</th></tr>
<tr><td>Scope<br>Business</td><td colspan="5">Requirements Analysis, Architecture and Design.<br>Project Phases: Preliminary Analysis & Conceptual Specification<br>41% of all IT Failures</td></tr>
<tr><td>System<br>Technology<br>Deployment<br>Operations</td><td>Policy Evolution<br>Project Phases: Conv. & Deploy. & Prod. & Admin<br>4% of all IT Failures</td><td colspan="3">Information Technology Specification, Implementation, and Operation<br>Project Phases: Binding & Implementation<br>5% of all IT Failures</td><td colspan="2">After Deployment: Production and Operation<br>Project Phases: Conversion & Deployment & Production and Administration<br>50% of all IT Failures</td></tr>
</table>

**Figure 2**. Knowledge Worker Framework and high-level percentages of failures.

| Knowledge Worker Framework | | | | | | | Row Totals of GAO Allocated Errors in Percent |
|---|---|---|---|---|---|---|---|
| | | Man-Machine Interface | | | | | |
| | | Machine | | Interface | Man | | |
| Deliverables | Mission | Database Object | Business Information System | Business Event | Business Function | Organ-ization | |
| **Scope** | 5 | 2 | 3 | 1 | 3 | 4 | **18** |
| **Business** | 5 | 3 | 2 | 1 | 6 | 6 | **23** |
| **System** | 3 | **2** | **2** | **1** | 12 | 8 | **28** |
| **Technology** | 1 | **0** | **0** | **0** | 8 | 6 | **15** |
| **Deployment** | 0 | **0** | **0** | **0** | 5 | 5 | **10** |
| **Operations** | 0 | **0** | **0** | **0** | 3 | 3 | **6** |
| **Col. Totals** | **14** | **7** | **7** | **3** | **37** | **32** | **100** |

**Table 2. Distribution of Knowledge Worker Framework Failure Percentages by Row and Column.**

***Note:*** All numbers expressed as Percent allocations of errors to cells ...12 Gray cells are Information Technology Cells.

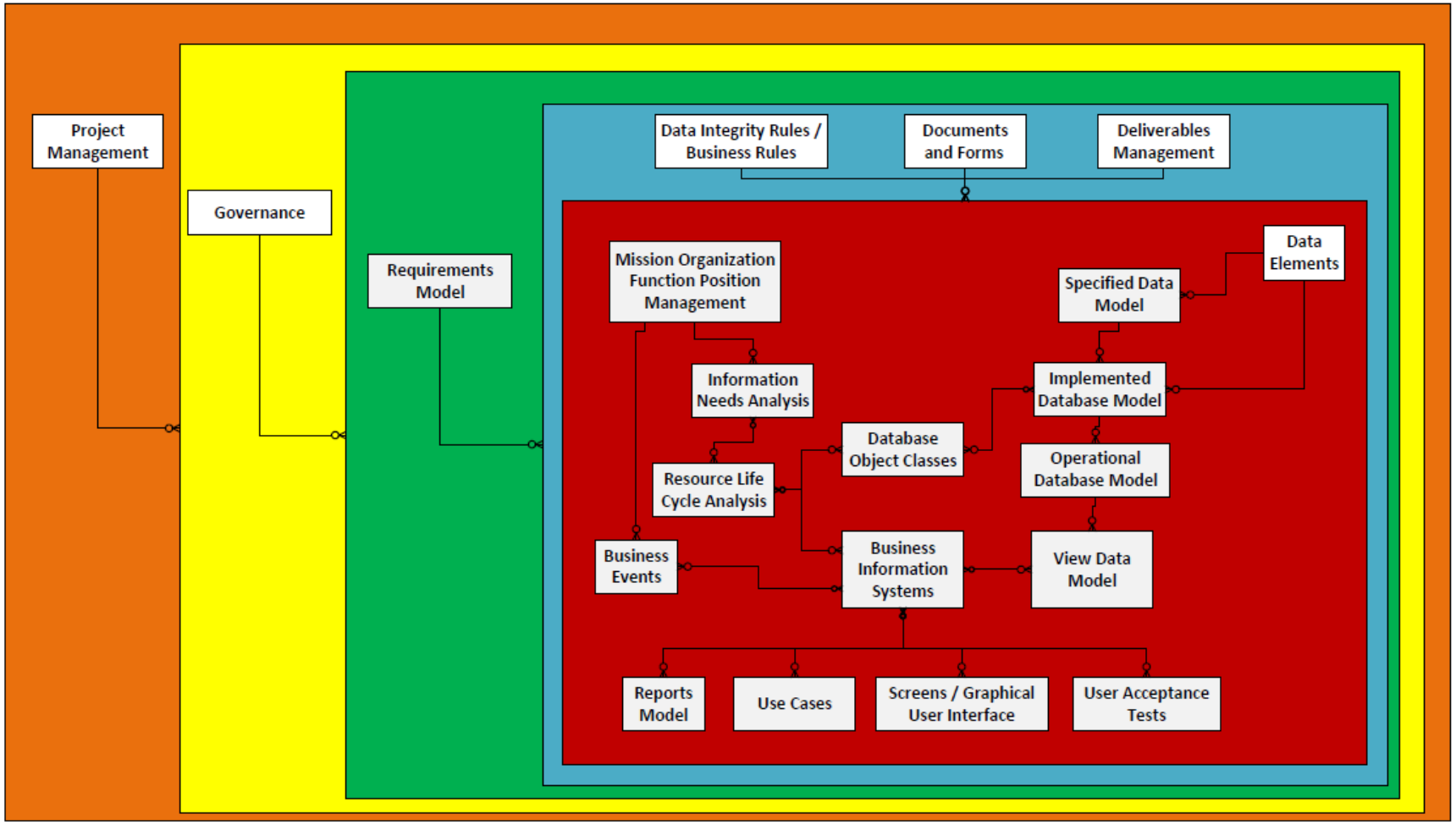



**Figure 3**. Middle-Level Detail of Metabase Function Modules and Interrelationships.

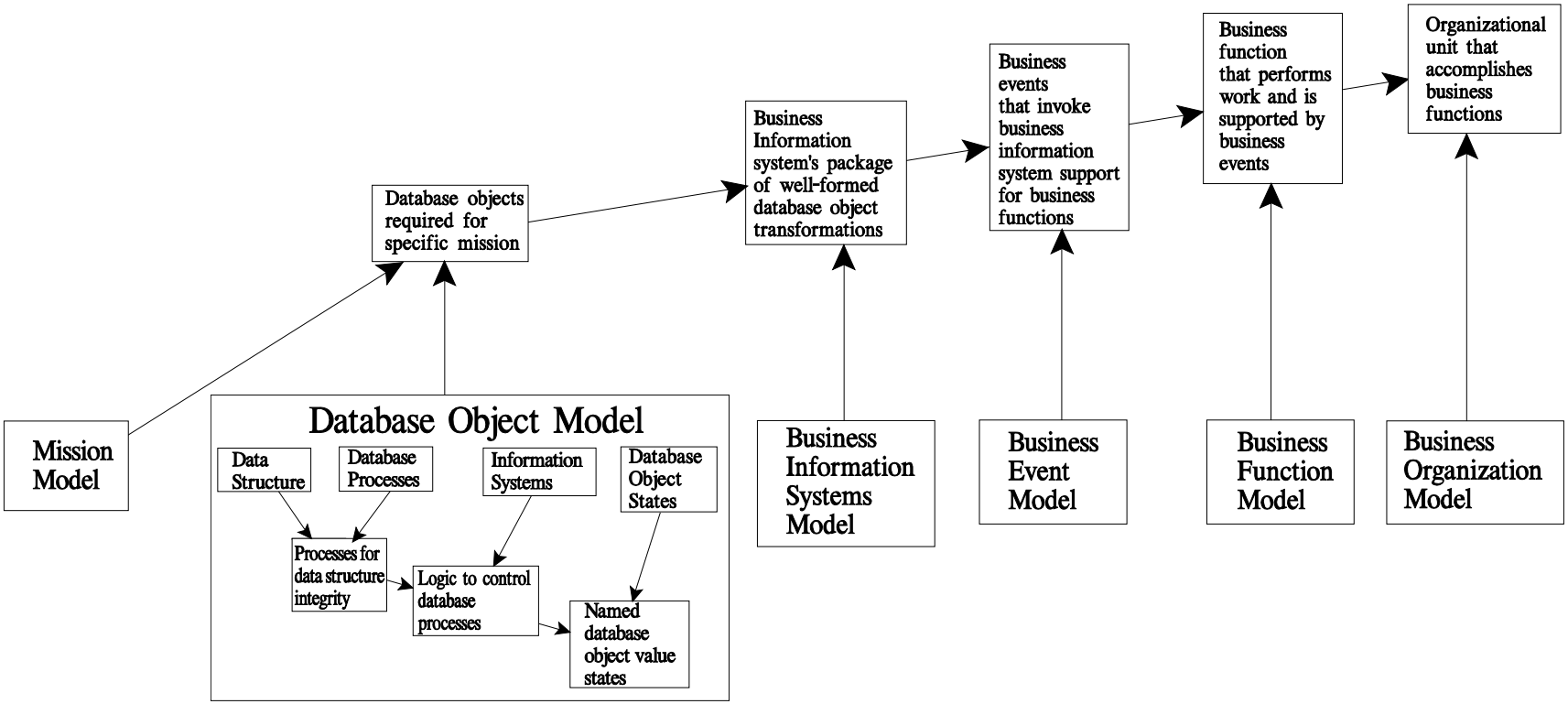



**Figure 4**. Knowledge Worker Framework Columns and Interrelationships.

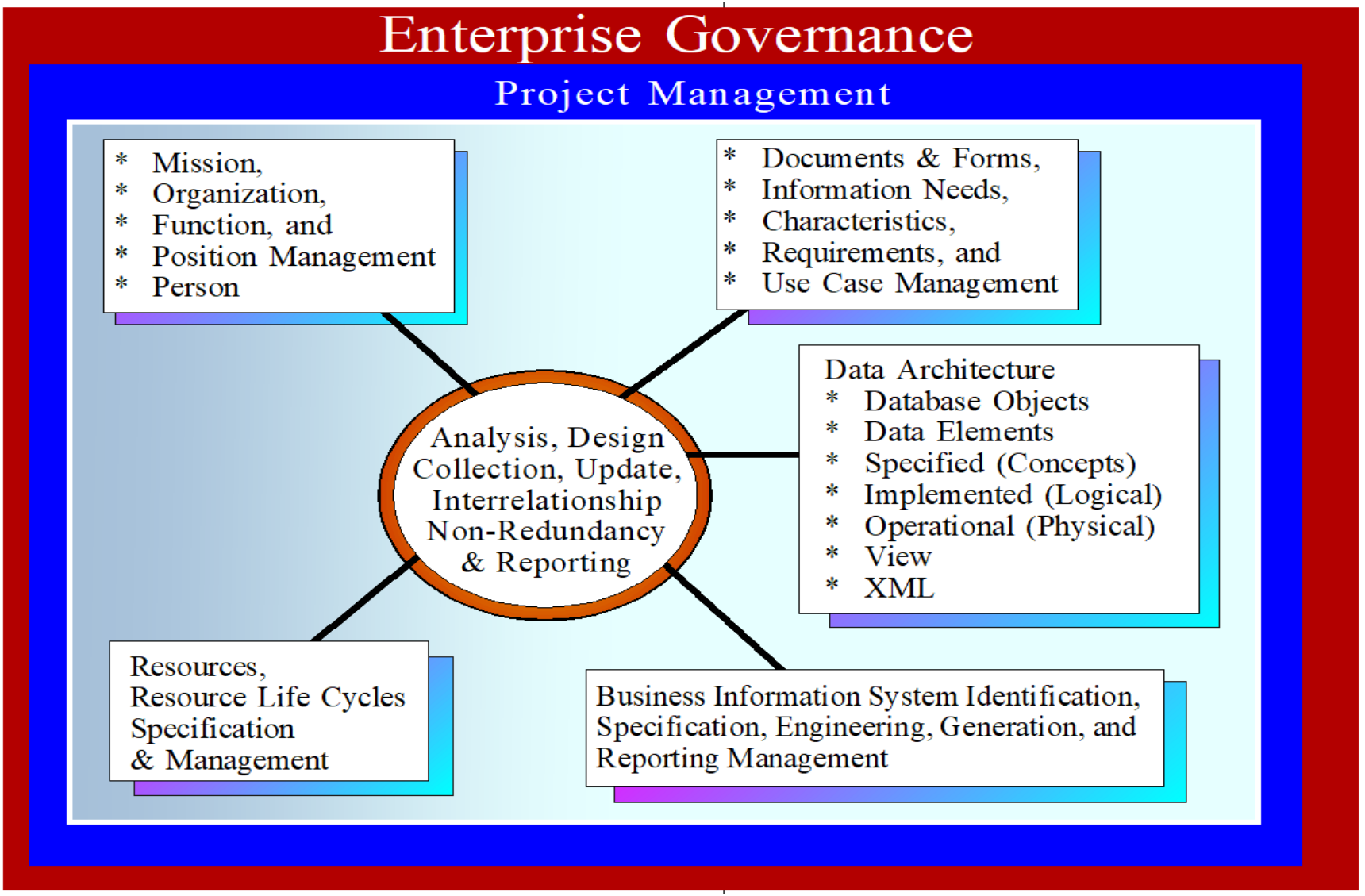



**Figure 5**. Activities Involved in Work Product Capture, Storage and Deployment.

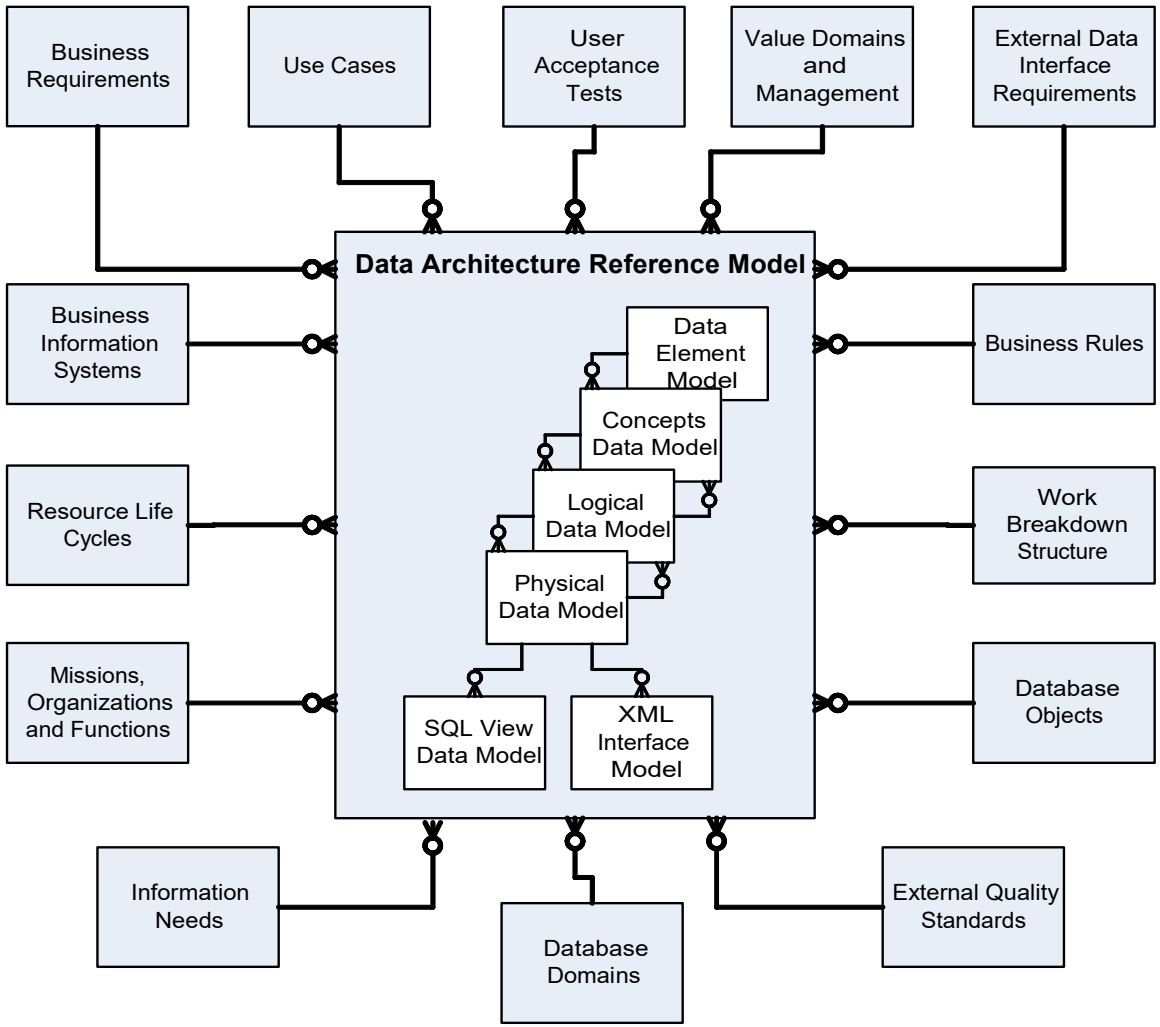



**Figure 6. Data Architecture Data Models Role as SDLC Work-Product Integrator**

| Metabase Software Module | | Knowledge Worker Framework | | | | | |
|---|---|---|---|---|---|---|---|
| | | **Mission** | **Database Objects** | **Business Information System** | **Business Event** | **Business Function** | **Business Organization** |
| Mission, Organization, Function Position Persons, Enterprise Governance, Project Management | | ✔ | ✔ | | ✔ | ✔ | ✔ |
| Resource Life Cycles | | | ✔ | ✔ | | | |
| Document & Form, Information Needs Analysis, Requirements, Use Cases, and Data Integrity Rule Specification & Binding | | | | ✔ | | ✔ | |
| Data Modeler | Data Elements | | ✔ | | | | |
| | Specified Data Model | | ✔ | | | | |
| | Implemented Data Model | | ✔ | | | | |
| | Operational Data Model | | ✔ | ✔ | | | |
| | View Data Model | | ✔ | ✔ | ✔ | | |
| Business Information Systems, Reports, and Screens Frames | | | | ✔ | | | |
| Information Systems Planning | | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ |

**Table 3.** Cross Reference between Metabase System Function Modules and Knowledge Worker Framework Columns

| Business Questions Addressed by the Metabase Modules Within the Knowledge Worker Framework | | | | | | |
|---|---|---|---|---|---|---|
| | Knowledge Worker Framework Columns | | | | | |
| **Metabase Software Module Scope** | Mission | Database Objects | Business Information Systems | Business Event | Business Function | Business Organization |
| **Business Event Management**: *What are the business events, where are they, how are they related to both the overall business's process model and calendar models, and then now are these events related to 1) mission, organization, function, 2)business information systems, 3) business event cycles, and 4) calendar cycles. What is the impact on these business events when policy (a.k.a., data) is required or changed.* | | | | ✔ | | |
| **Business Information Systems**: *What are the business information systems, where are they, how are they related to mission, organization, function, and databases. What is the impact on these business information systems when policy (a.k.a., data) is required or changed.* | | | ✔ | | | |
| **Data Element Model**: *What are the context independent business facts and their specifications that can be deployed to fully define the semantics that define these business facts, or that form the basis for these business facts as they are refined through the allocation of semantic and data use modifiers. Where are these data element semantics deployed throughout the various data models whose facts (attributes, columns, DBMS columns, and View columns are based on these facts.* | | ✔ | | | | |

| Business Questions Addressed by the Metabase Modules Within the Knowledge Worker Framework | | | | | | |
|---|---|---|---|---|---|---|
| | Knowledge Worker Framework Columns | | | | | |
| **Metabase Software Module Scope** | Mission | Database Objects | Business Information Systems | Business Event | Business Function | Business Organization |
| **Data Integrity Rule Specification and Binding**: *What are the rules that govern the integrity of data that is specified across all the deployed uses of that data. How are these rules defined and where are they bound such they are defined once and bound where appropriate? What are the processes and how are these processes executed that ensure data integrity during all data object operations?* | | ✔ | ✔ | | | |
| **Database Objects**: *What are the major data-based object classes and objects that form enterprise databases. What are the state-based process life cycles for these data-based object classes? What are the database record (i.e., table-based) processes that control the fundamental integrity of individual database records. What are the data-based object class business information systems that transform database objects from one predefined value-state to another?* | | ✔ | ✔ | | | |
| **Document and Form**: *What documents and forms provide critical information about the enterprise? How are those documents and forms interrelated one with the other? How are these materials subdivided and then properly related to specific functions performed by organizations in the accomplishment of missions? How are these able to be related to certain View columns?* | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ |

| Business Questions Addressed by the Metabase Modules Within the Knowledge Worker Framework | | | | | | |
|---|---|---|---|---|---|---|
| | Knowledge Worker Framework Columns | | | | | |
| **Metabase Software Module Scope** | Mission | Database Objects | Business Information Systems | Business Event | Business Function | Business Organization |
| **Enterprise's Architectures Management:** *What are the five distinct architectures that comprise the over set within the enterprise, and how are these architectures intersected and mapped to the Knowledge Worker Framework in support of projects that contribute to the build rationale and sequence of an overall Information Systems Plan?* | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ |
| **Enterprise Governance**: *Who are the persons, and what is their enterprise context, that is, their Mission, Organization, Function, and Position who are currently responsible for the integrity and correctness of a large collection of work products that are developed within the scope of the various Metabase System Functional modules.* | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ |
| **Functions**: *What are the human-based processes performed by groups in their achievement the various missions of the enterprise from within different enterprise organizations? What human processes are common across and within organizations, business events and by indirection, business information systems and databases?* | | | | | ✔ | |

| Business Questions Addressed by the Metabase Modules Within the Knowledge Worker Framework | | | | | | |
|---|---|---|---|---|---|---|
| | Knowledge Worker Framework Columns | | | | | |
| **Metabase Software Module Scope** | Mission | Database Objects | Business Information Systems | Business Event | Business Function | Business Organization |
| **Implemented Data Model**: *What are the database models that are able to be employed as the basis of operational databases that can be employed by business information systems? What are the database implementations of data-based concepts contained in the specified data models? What are the various columns, including value domains, data integrity processes, and data types that are an implementation of various data elements and/or attributes from specified data models that defined concepts?* | | ✔ | | | | |
| **Information Needs Analysis**: *What information (a.k.a. query results or reports) is needed by various organizations in their functional accomplishment of missions and what databases and information systems provide this information?* | | ✔ | ✔ | | | |
| **Missions**: *What are the essential missions that define the very existence of the enterprise, and that are the ultimate goals and objectives that measure enterprise accomplishment from within different business functions and organizations?* | ✔ | | | | ✔ | ✔ |
| **Operational Data Model**: *What are the actual databases and models that are employed by business information systems? What are the databases and models that operationally specify data-based specifications from DBMS independent database models? What are the various DBMS columns, including value domains, data integrity processes, and data types that are an implementation of various data elements and/or attributes from specified data models that defined concepts?* | | | | | | |

| Business Questions Addressed by the Metabase Modules Within the Knowledge Worker Framework | | | | | | |
|---|---|---|---|---|---|---|
| | Knowledge Worker Framework Columns | | | | | |
| **Metabase Software Module Scope** | Mission | Database Objects | Business Information Systems | Business Event | Business Function | Business Organization |
| **Organizations**: *Which organizations are accomplishing what aspects of missions with what databases, information systems and through which functions*? | ✔ | | | ✔ | ✔ | ✔ |
| **Project Management**. *What are the various knowledge worker projects that address one or more collections of activities that create an IT work product that supports the enterprise? What are the detailed deliverables, collections of tasks, assigned staff, work accomplishment resources, and work environment factors that affect the accomplishment of project work. What are all the different projects by IT work product.* | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ |
| **Reports**. *What are the specifications of the reports that are to be generated by business information systems and/or DBMS ad hoc query language or package report writers. What are the various view columns or directly connected database columns involved in the database?* | | | ✔ | ✔ | | |
| **Requirements**: *What are the requirements that in total support the development of key enterprise database components? How these requirements are interrelated, subdivided, and then related to the various metadata components that are "required" as a consequence? How can the complete set of effects can be known and interrelated?* | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ |

| Business Questions Addressed by the Metabase Modules Within the Knowledge Worker Framework | | | | | | |
|---|---|---|---|---|---|---|
| | Knowledge Worker Framework Columns | | | | | |
| **Metabase Software Module Scope** | Mission | Database Objects | Business Information Systems | Business Event | Business Function | Business Organization |
| **Resource Life Cycles**: *What are the key Resources (facilities, materiel, staff, etc.)?How are they sequenced, interrelated, and how are they supported through databases and information systems?* | | ✔ | ✔ | | | |
| **Specified Model**: *What are the data model specifications that represent concepts that are to be included in database models? What are the data elements that are represented as subject-entity-attributes across the specified concept data models? What are the various attribute-bound value domains, data integrity processes, and data types that are an implementation of various data elements?* | | ✔ | | | | |
| **Use Cases**: *What are the detailed business process scenarios required to accomplish the necessary work of the enterprise? What are the interrelationships among use cases? How are the use cases subdivided into certain events? What are the pre-, post-, and special-conditions of these use cases? What are the business facts that are read, selected, updated, and reported within use cases? What are the relationships between use case facts and database view column* | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ |
| **User Acceptance Tests**: *What are the requirements-based accepted tests deemed appropriate and necessary to determine the adequacy of a business information system before it is released? What are the requirements that are being validated as being completed? What are the business information system components that are being tested?* | | ✔ | ✔ | | | |

| Business Questions Addressed by the Metabase Modules Within the Knowledge Worker Framework | | | | | | |
|---|---|---|---|---|---|---|
| | Knowledge Worker Framework Columns | | | | | |
| **Metabase Software Module Scope** | Mission | Database Objects | Business Information Systems | Business Event | Business Function | Business Organization |
| **View Model**: *What are the data interface specifications between databases and business information systems? What are the various business information systems that are supported by specific databases? What are the various databases that are accessed by business information systems. What are the data-based mappings between views that support database interoperability? What are the data-based processes that transform data via one view to the data specifications of a different view?* | | ✔ | ✔ | | | |
| **Screens**: *What are the end-user graphical user interface specifications that enable end-users to interact with business information systems for data entry, formatted reports, ad hoc reporting, and for navigating through defined features of the business information systems? What are the various screens that are affected by specific view-column database interfaces with business information systems? What are the various processes that affect either the data presented through the wire frames or are stored in the databases? What are the various controls and invoked processes evident through the wire frames?* | | ✔ | ✔ | | | |

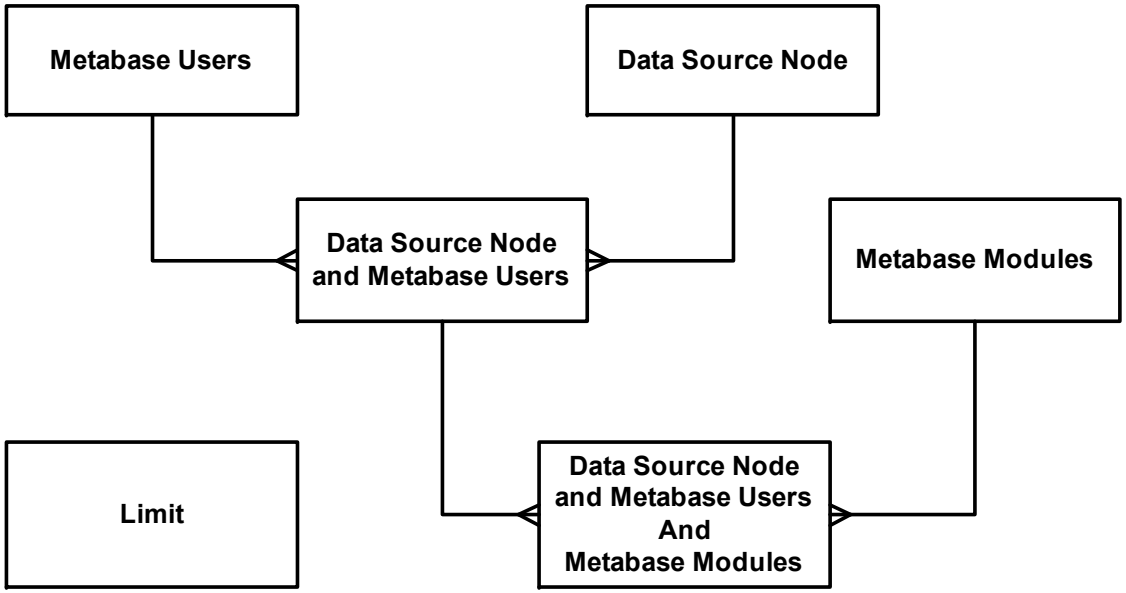
**Table 4.** Business Questions Addressed by the Knowledge Worker Framework Columns

## Metabase Work Product Data Models

The moste detailed of the Metabase System Functional layers are the data model diagrams of the individual Metabase System functional modules.

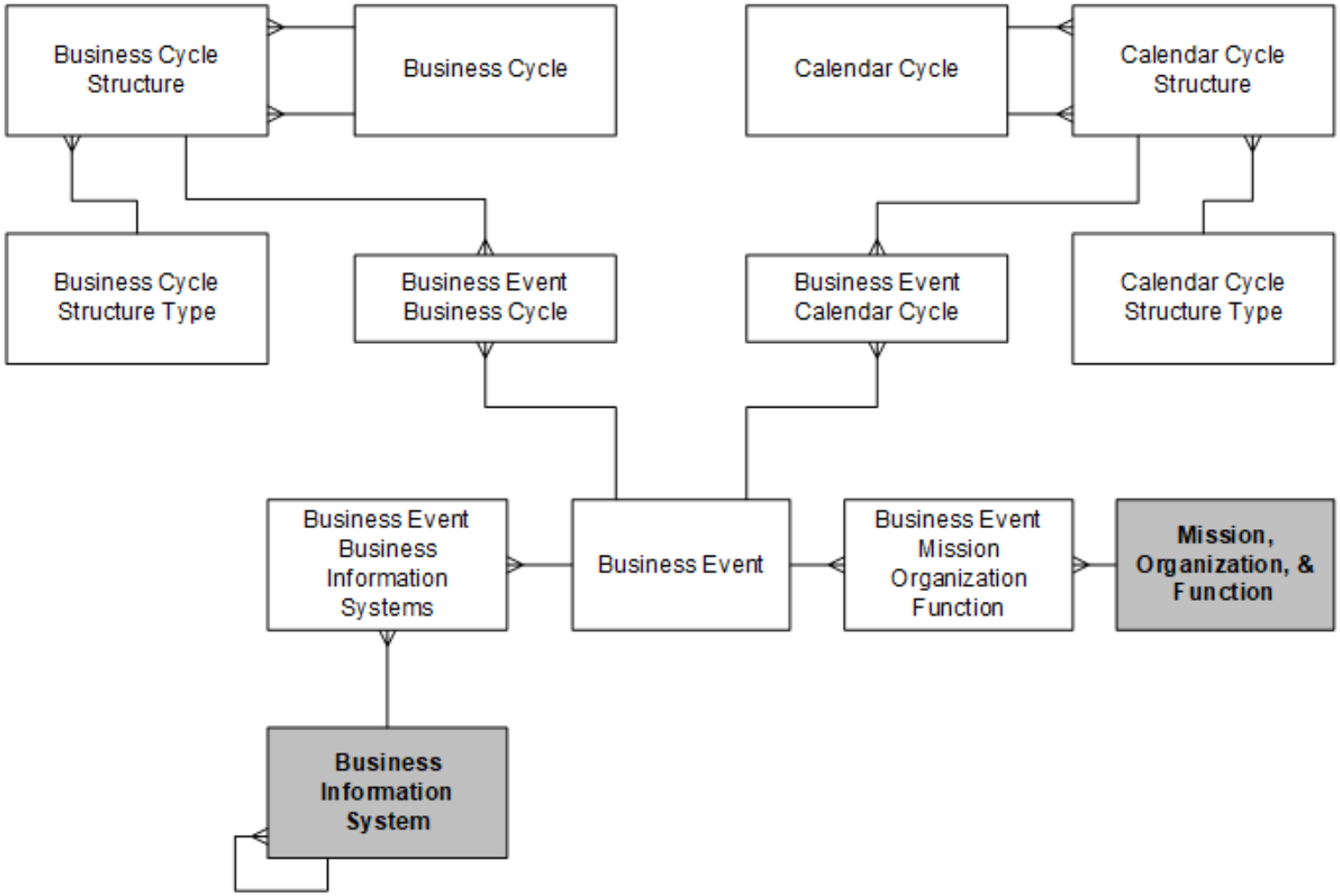
- Administrative Management
- Business Event Management
- Business Information Systems
- Database Objects
- Data Elements
- Data Integrity Rule: Specification
- Data Integrity Rules: Binding
- Document and Form
- Enterprise Governance
- Enterprise Architecture Management
- Implemented Data Model
- Information Needs Analysis
- Mission Organization, Function, and Position
- Operational Data Model
- Project Management
- Reports
- Requirements Management
- Resource Life Cycle Analysis
- Specified Data Model
- Use Cases
- User Acceptance Tests
- View Data Model
- Screens

**Administrative Management**

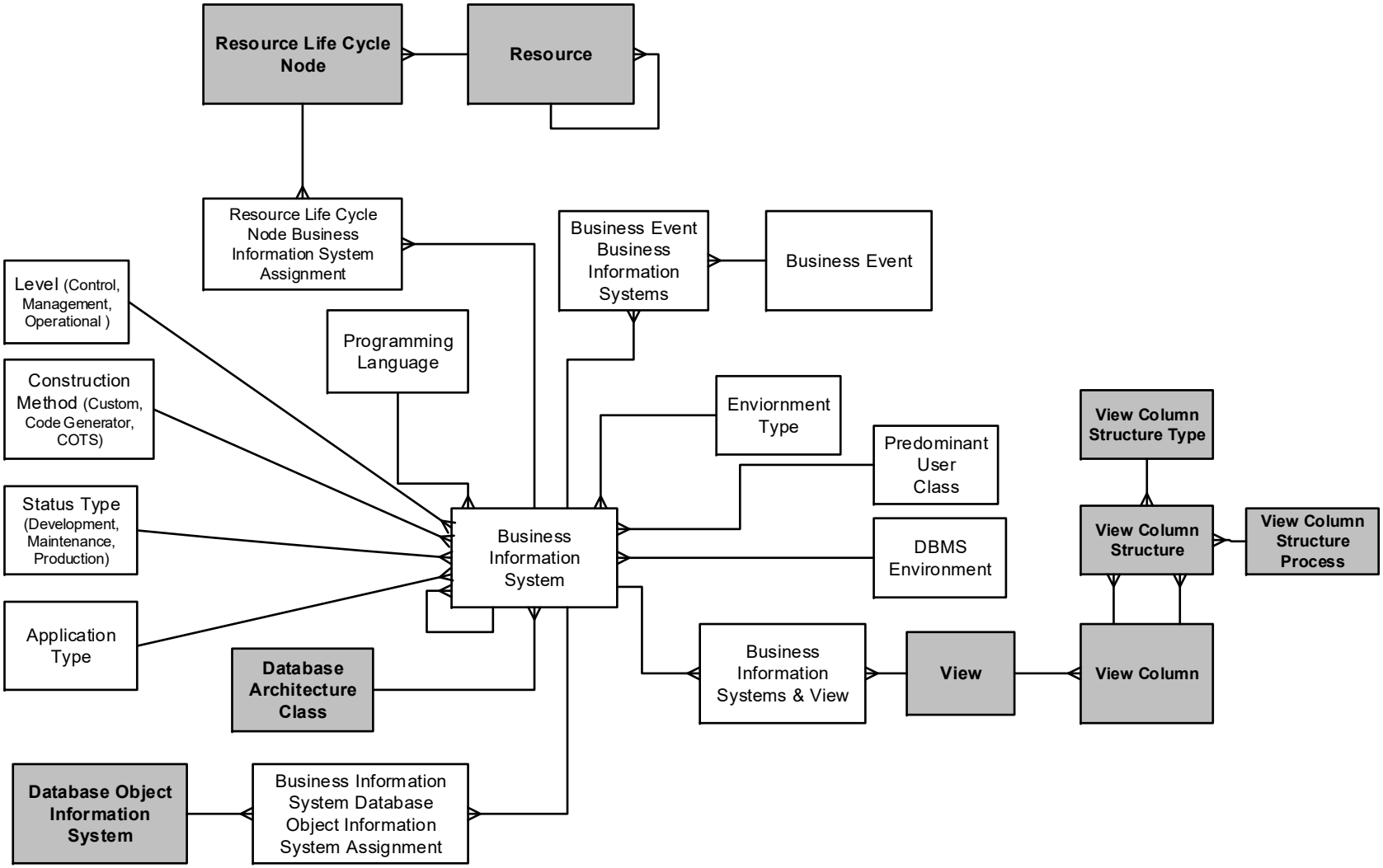



# Administrative Management

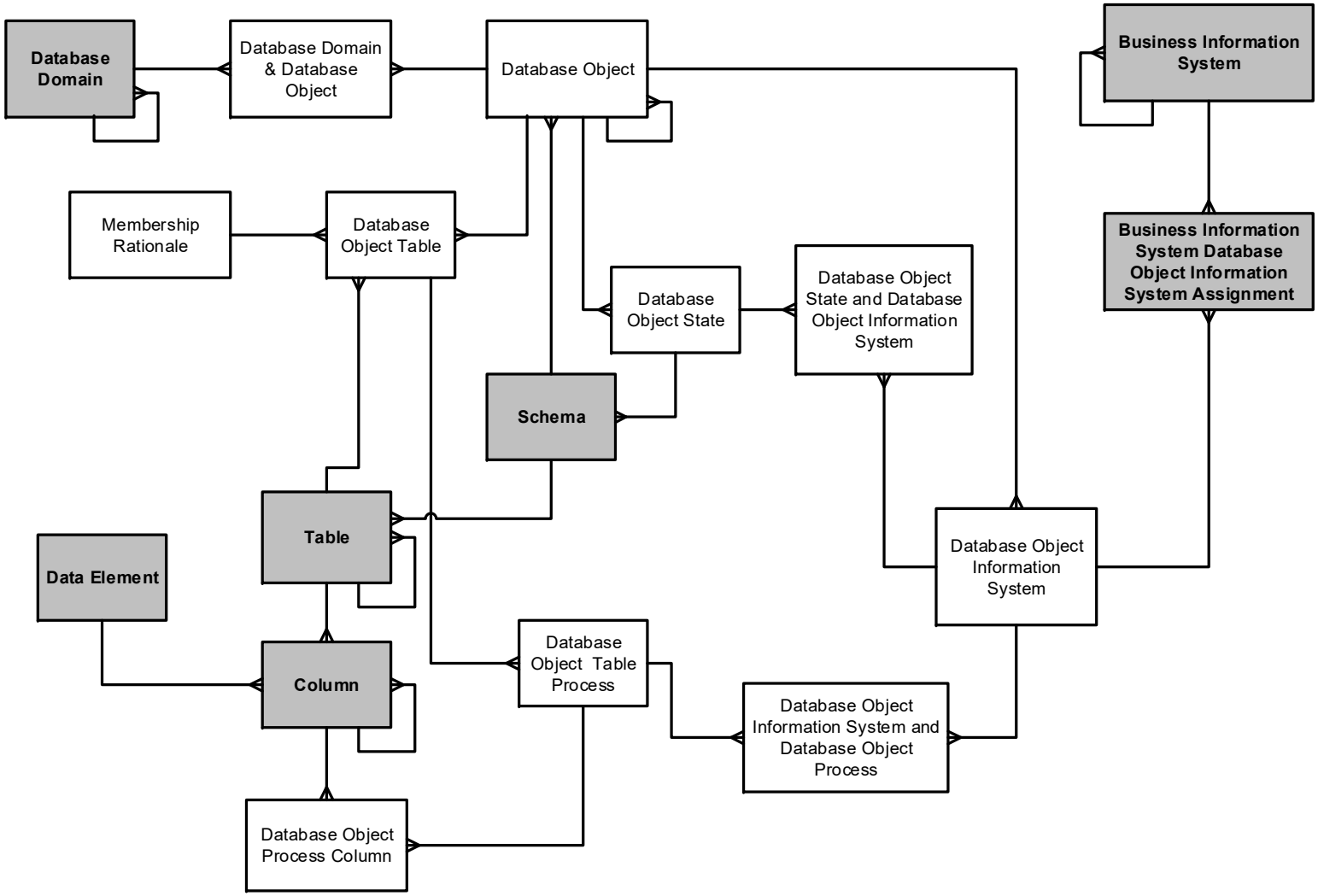
## Business Event Management



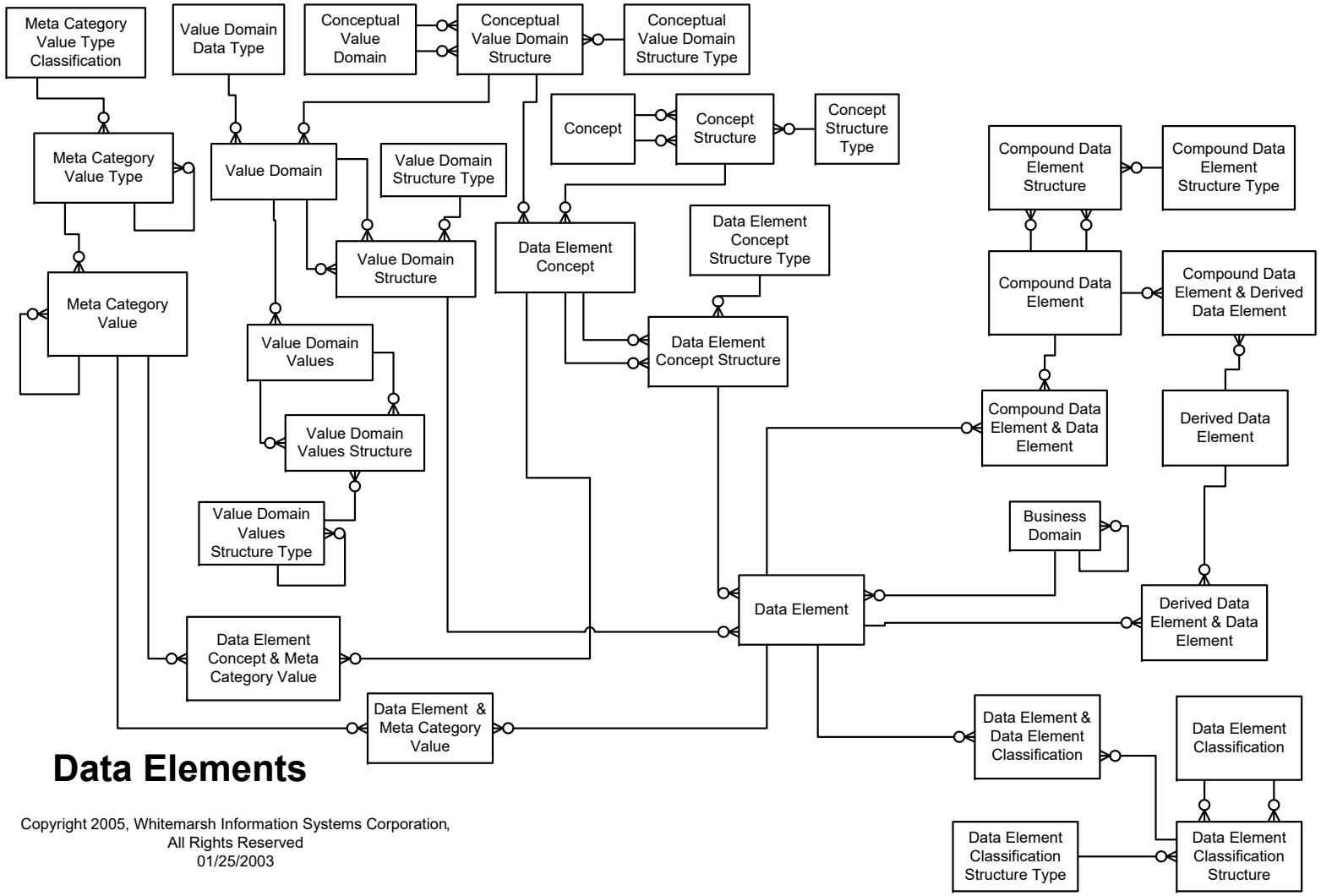
## Business Information Systems



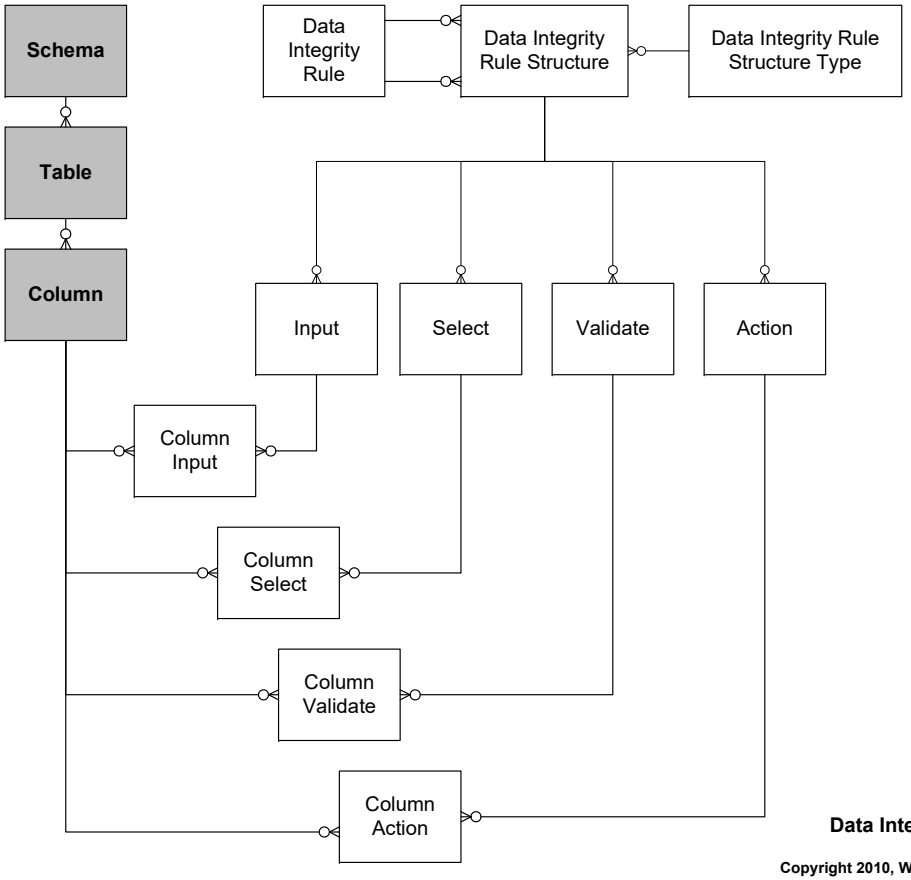
## Database Objects



## Data Elements

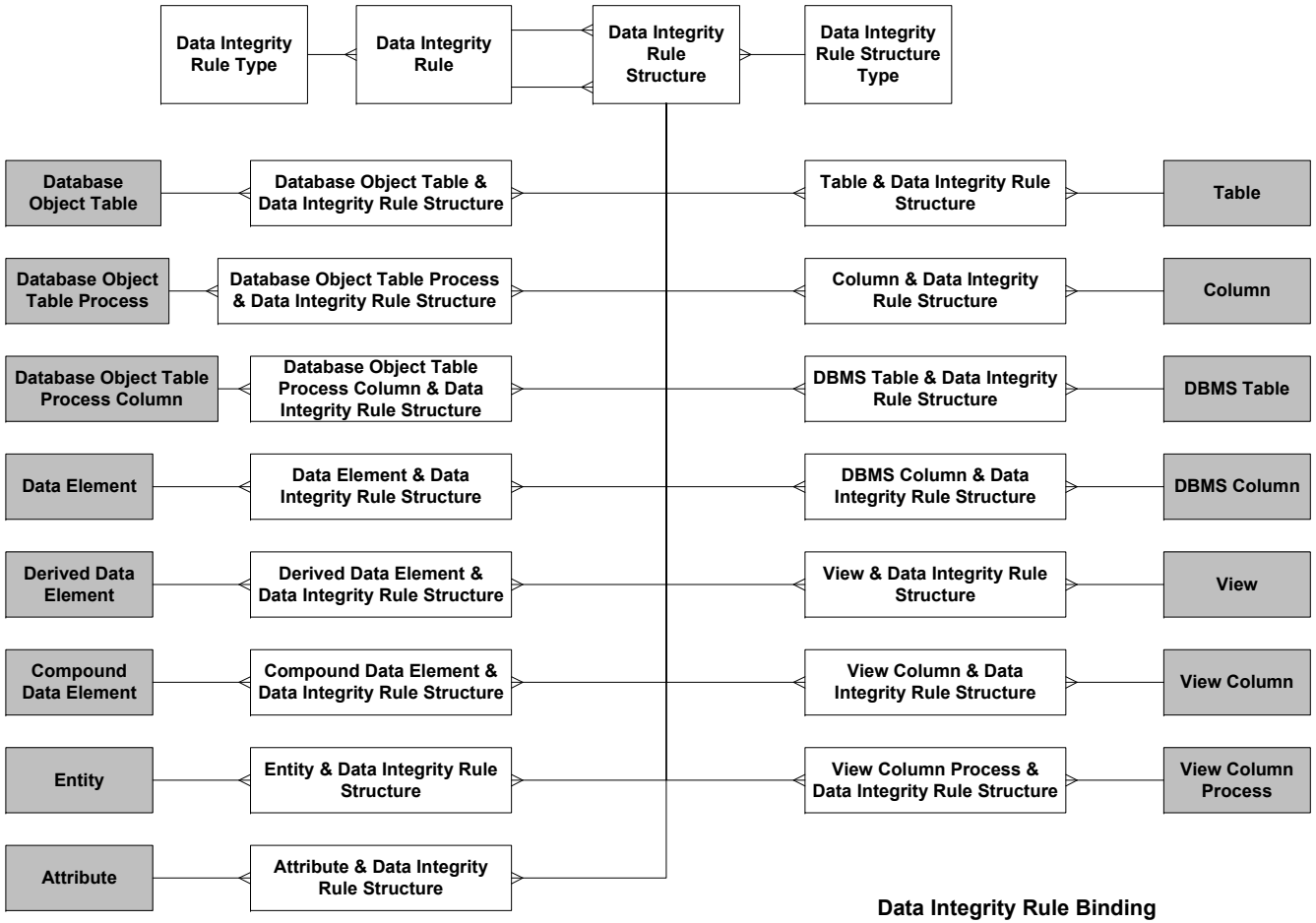


## Data Integrity Rule: Specification



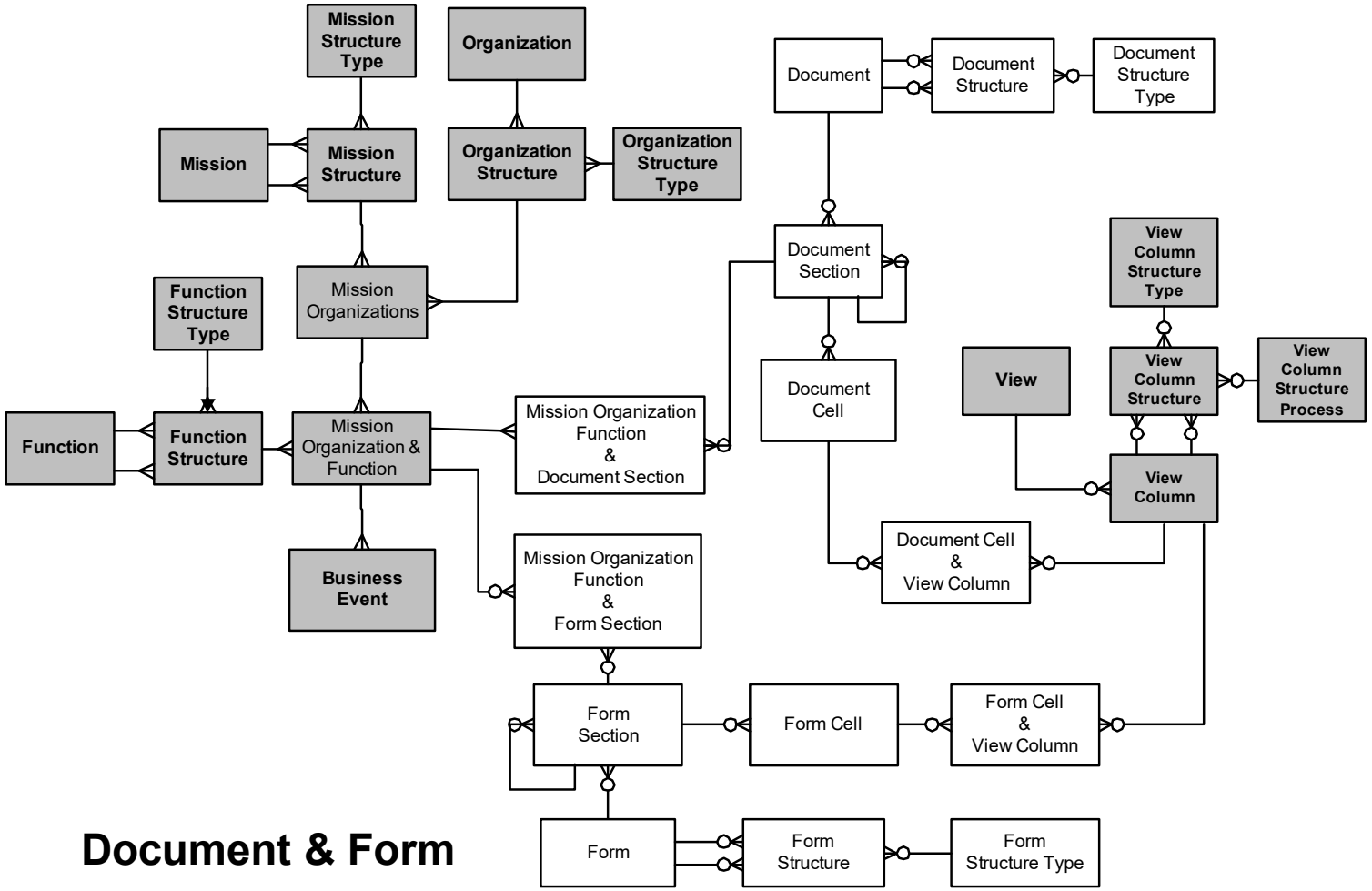

**Data Integrity Rule Specification**

## Data Integrity Rules: Binding

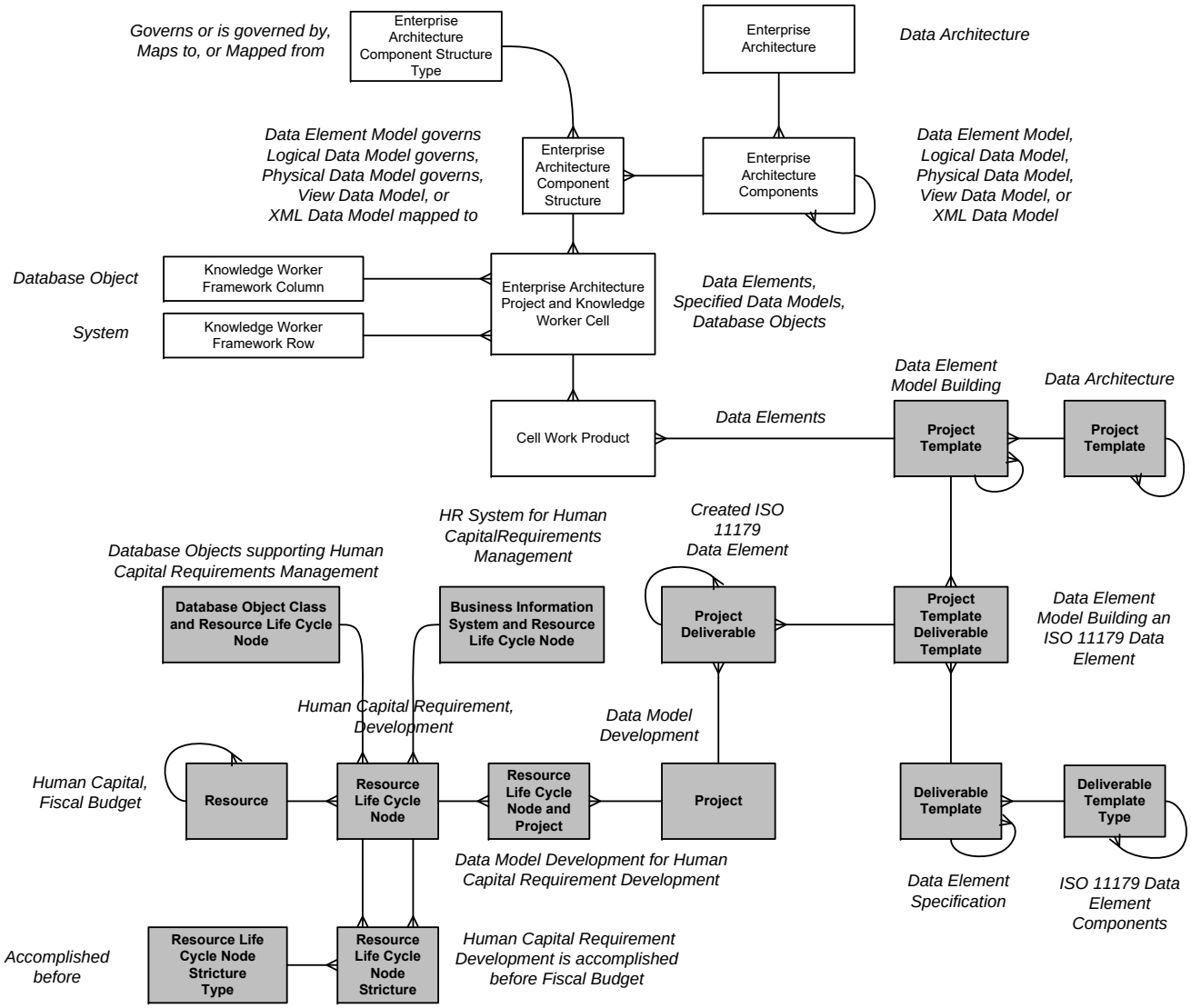



**Data Integrity Rule Binding**

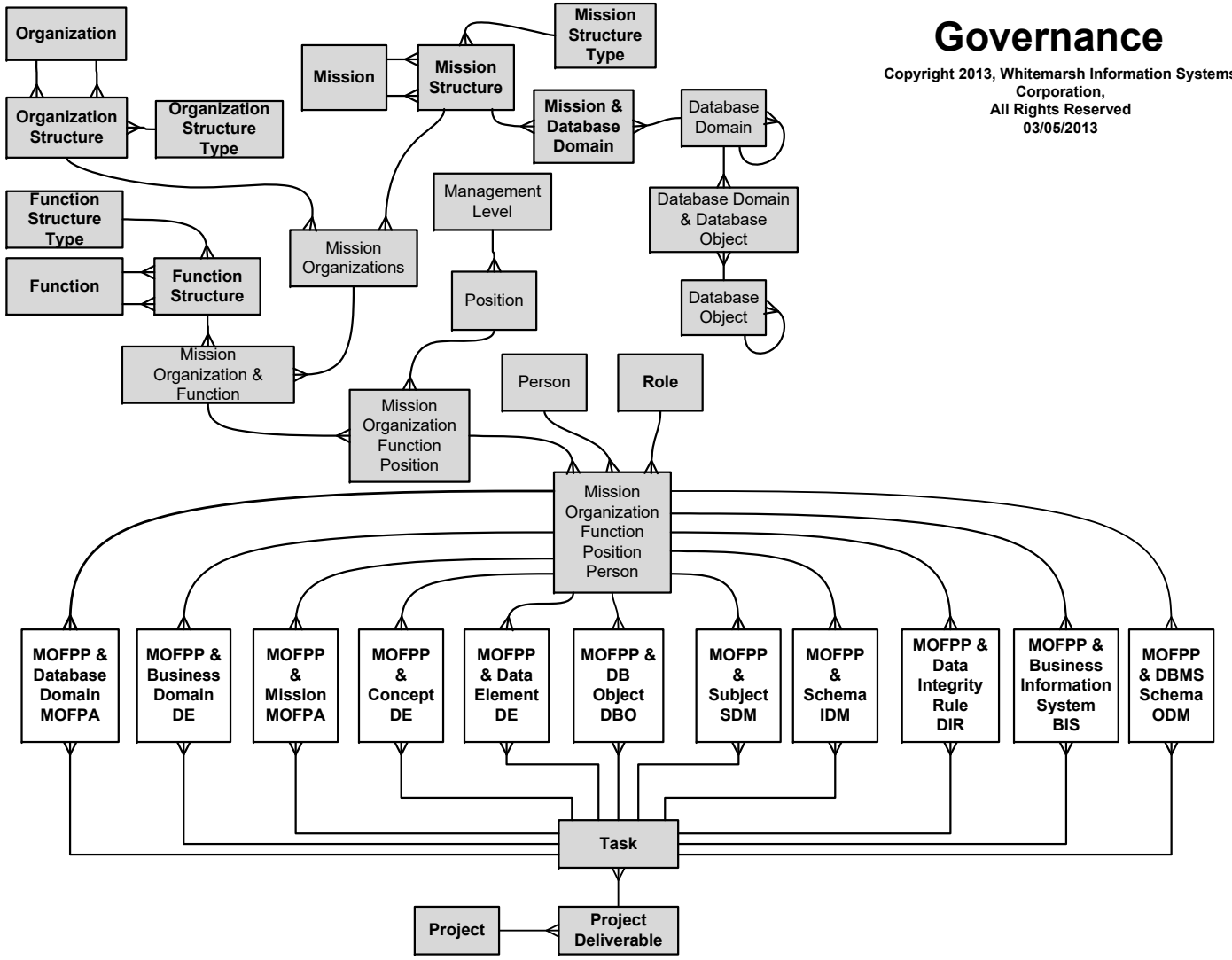
## Document and Form



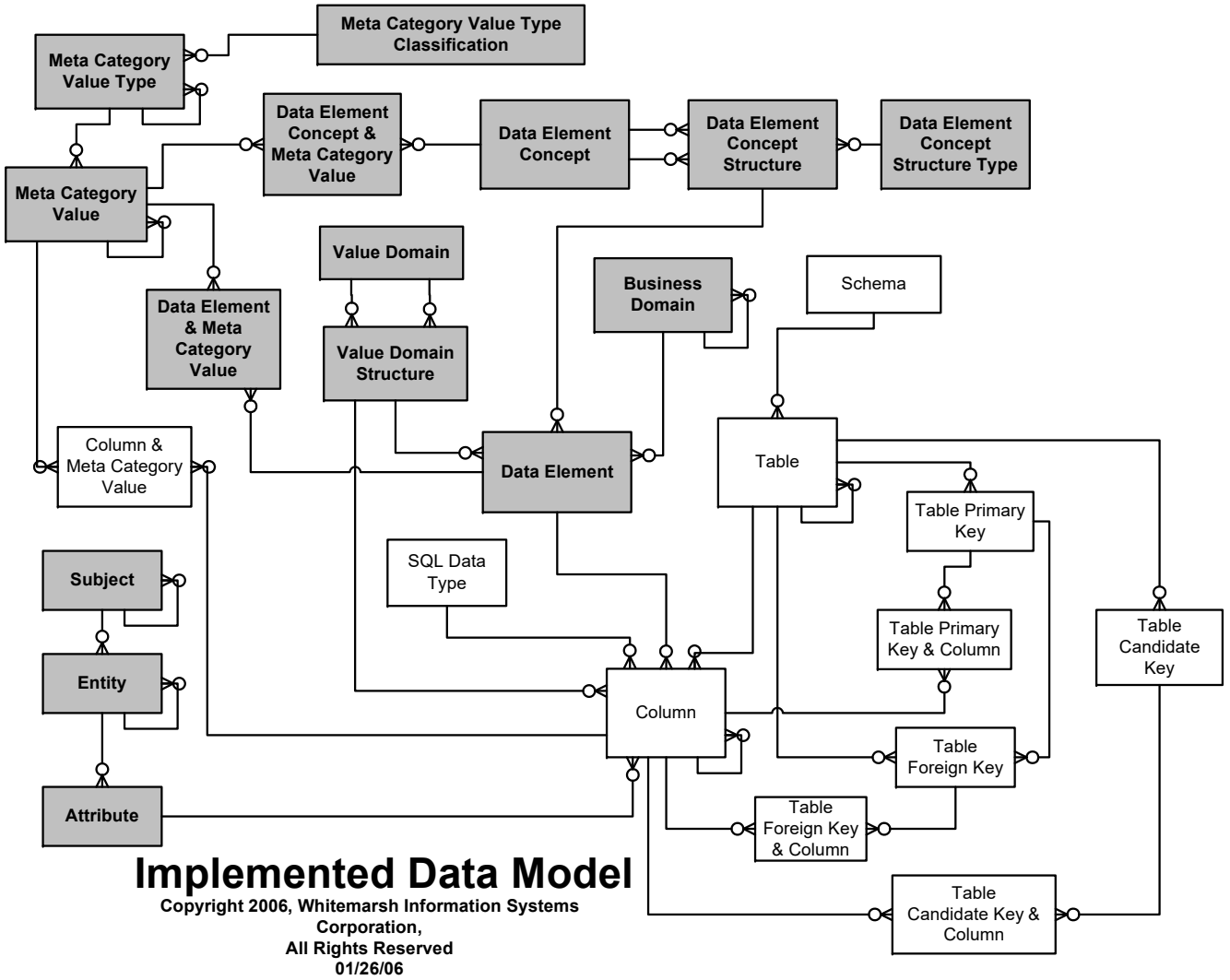
## Enterprise Architecture Management



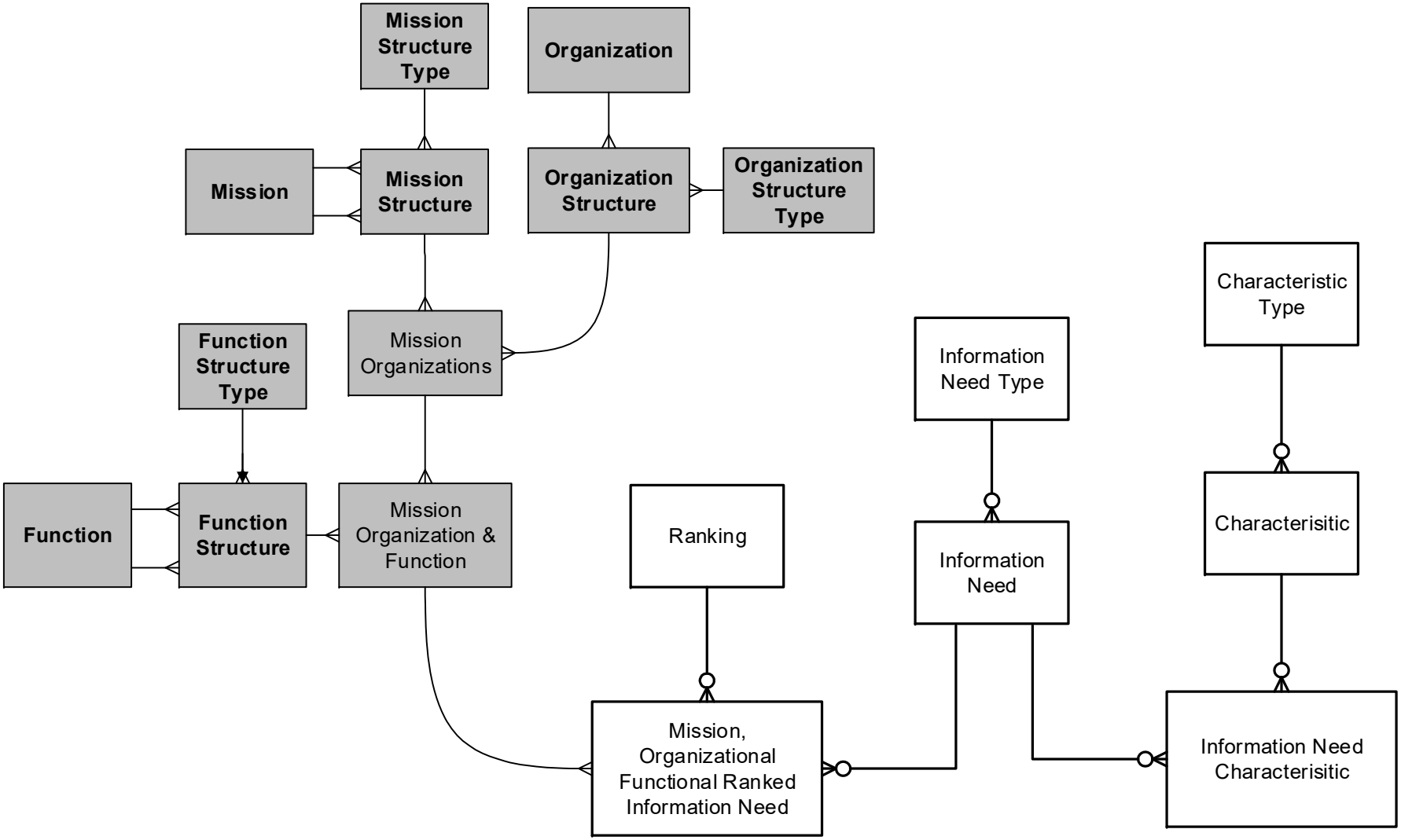
## Enterprise Governance



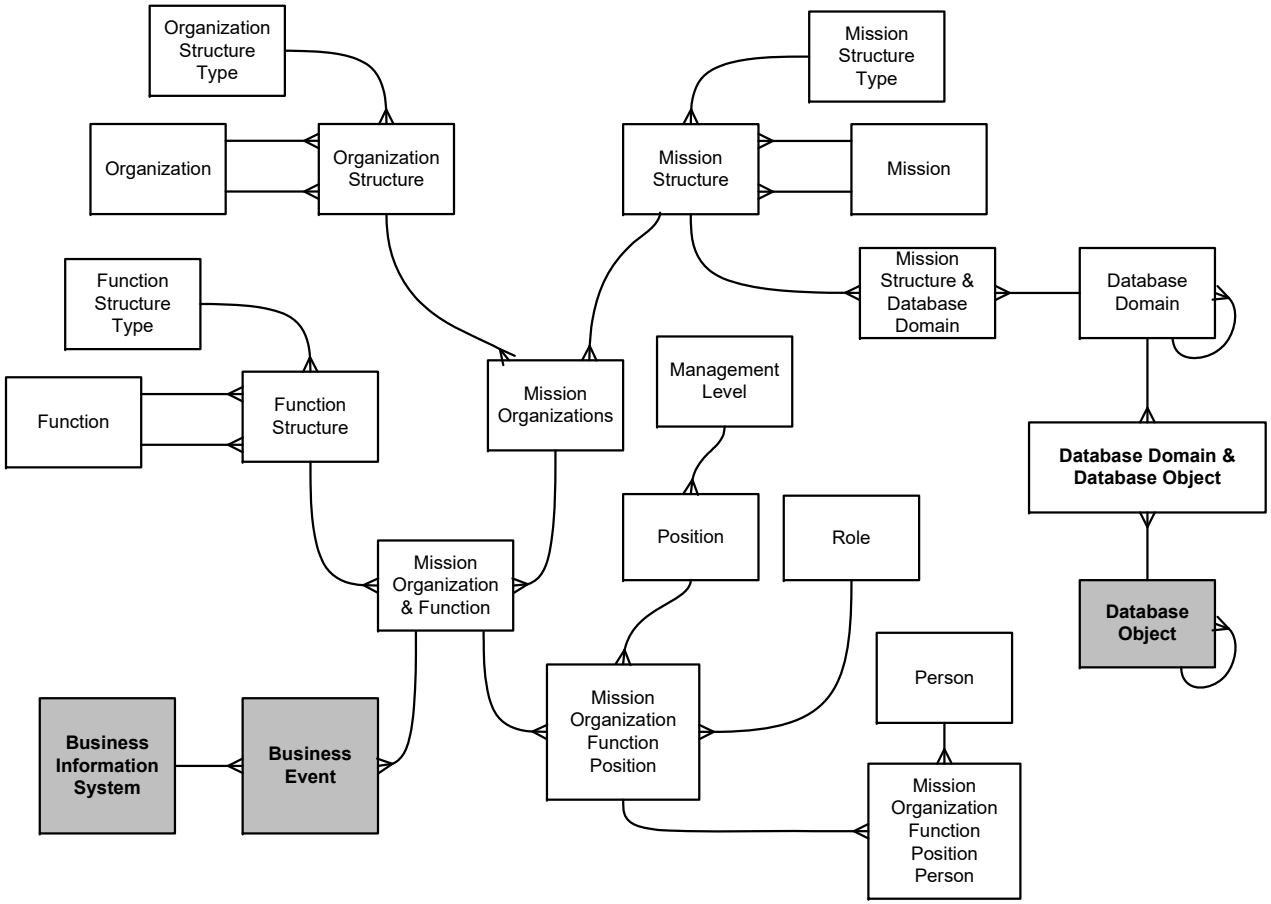
## Implemented Data Model



## Information Needs Analysis

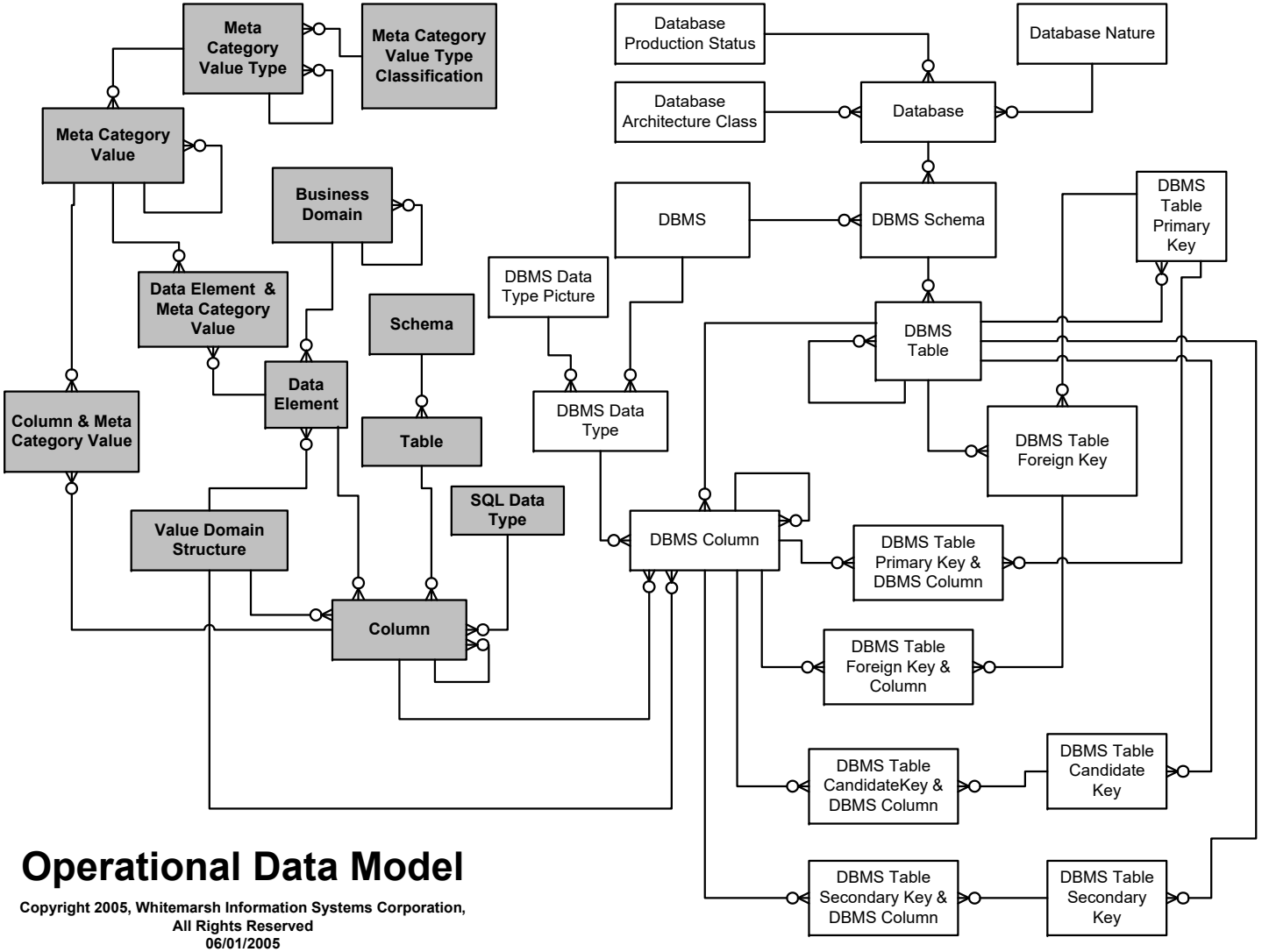


## Mission Organization, Function, and Position

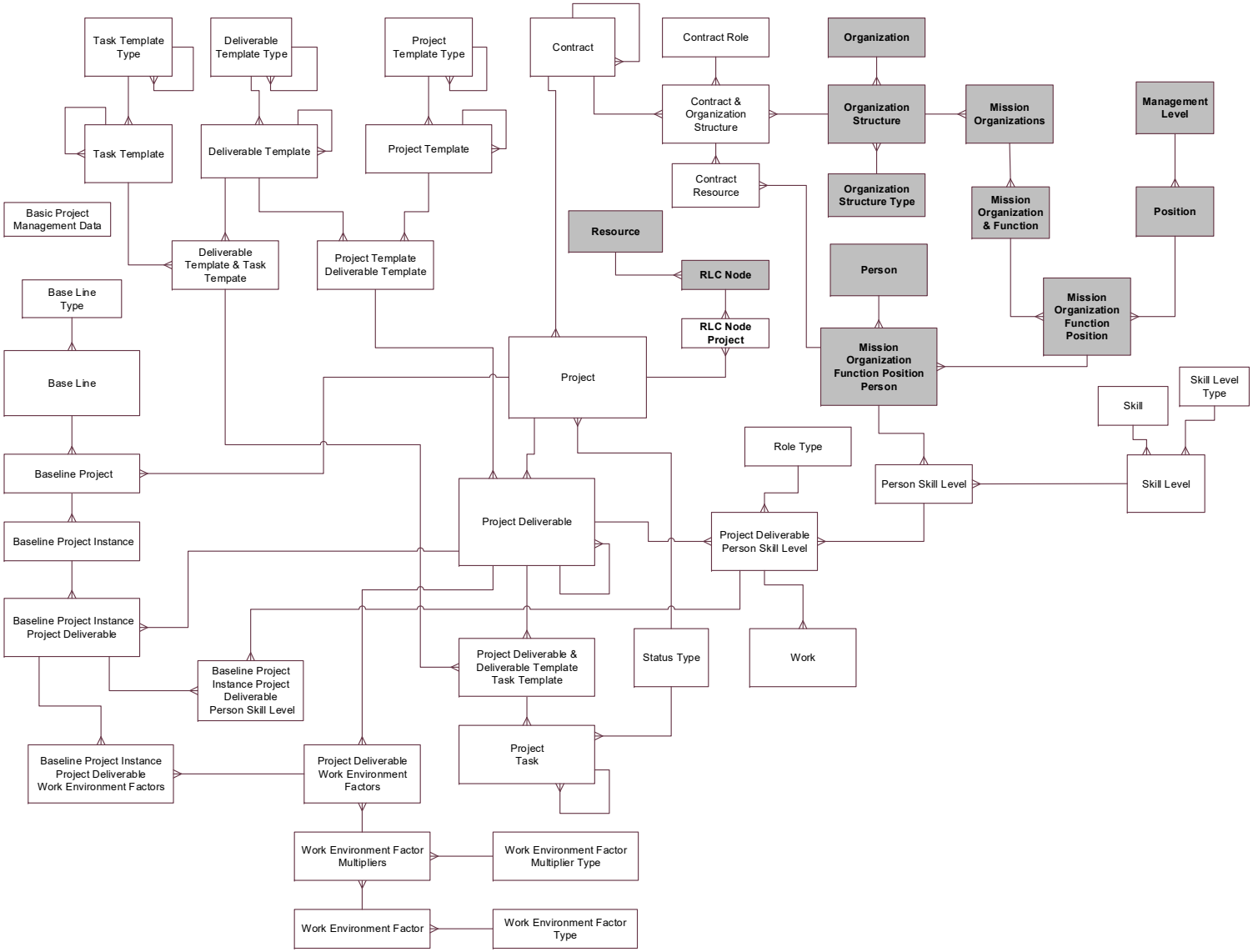



**Mission, Organization, Function, Position**

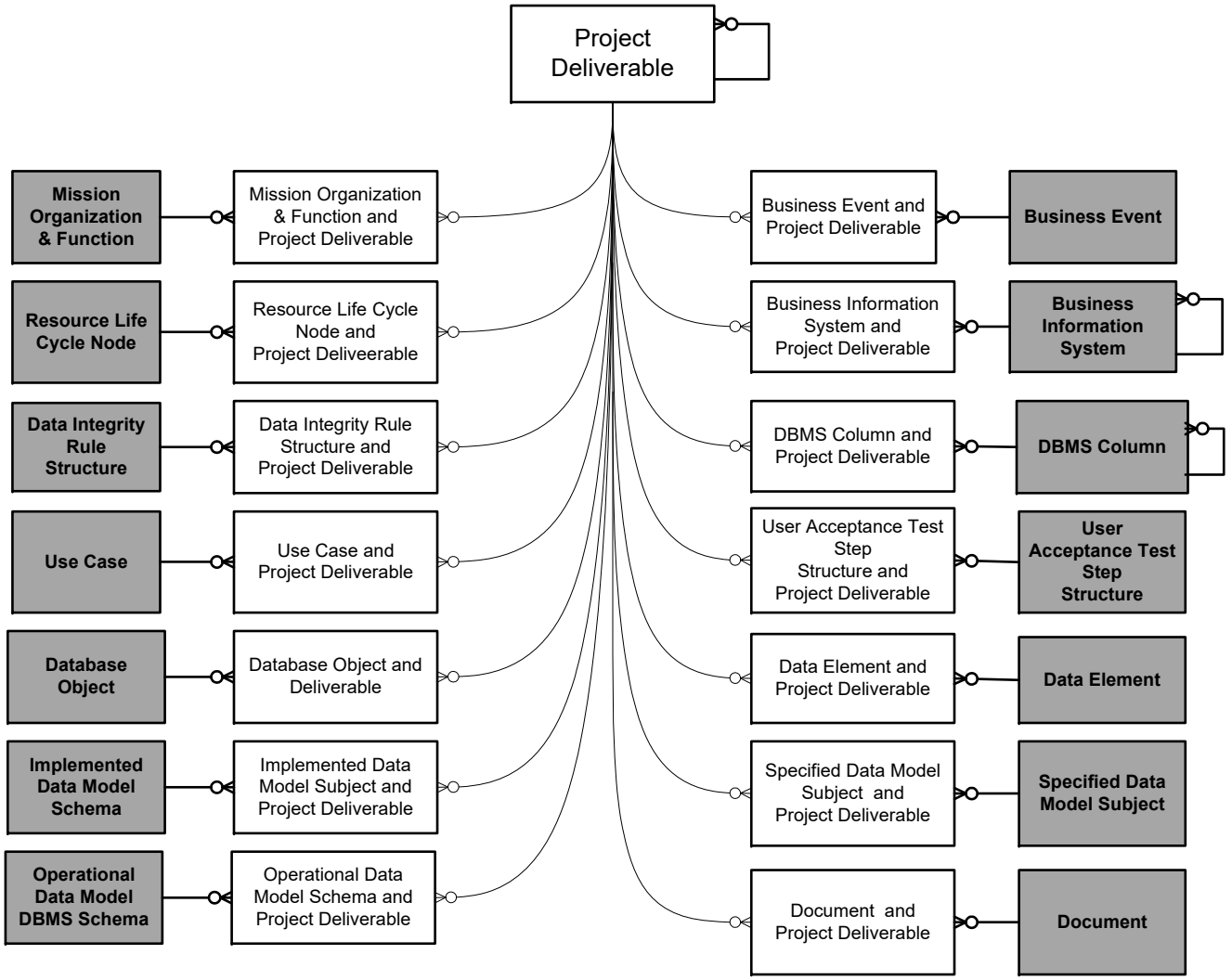
## Operational Data Model



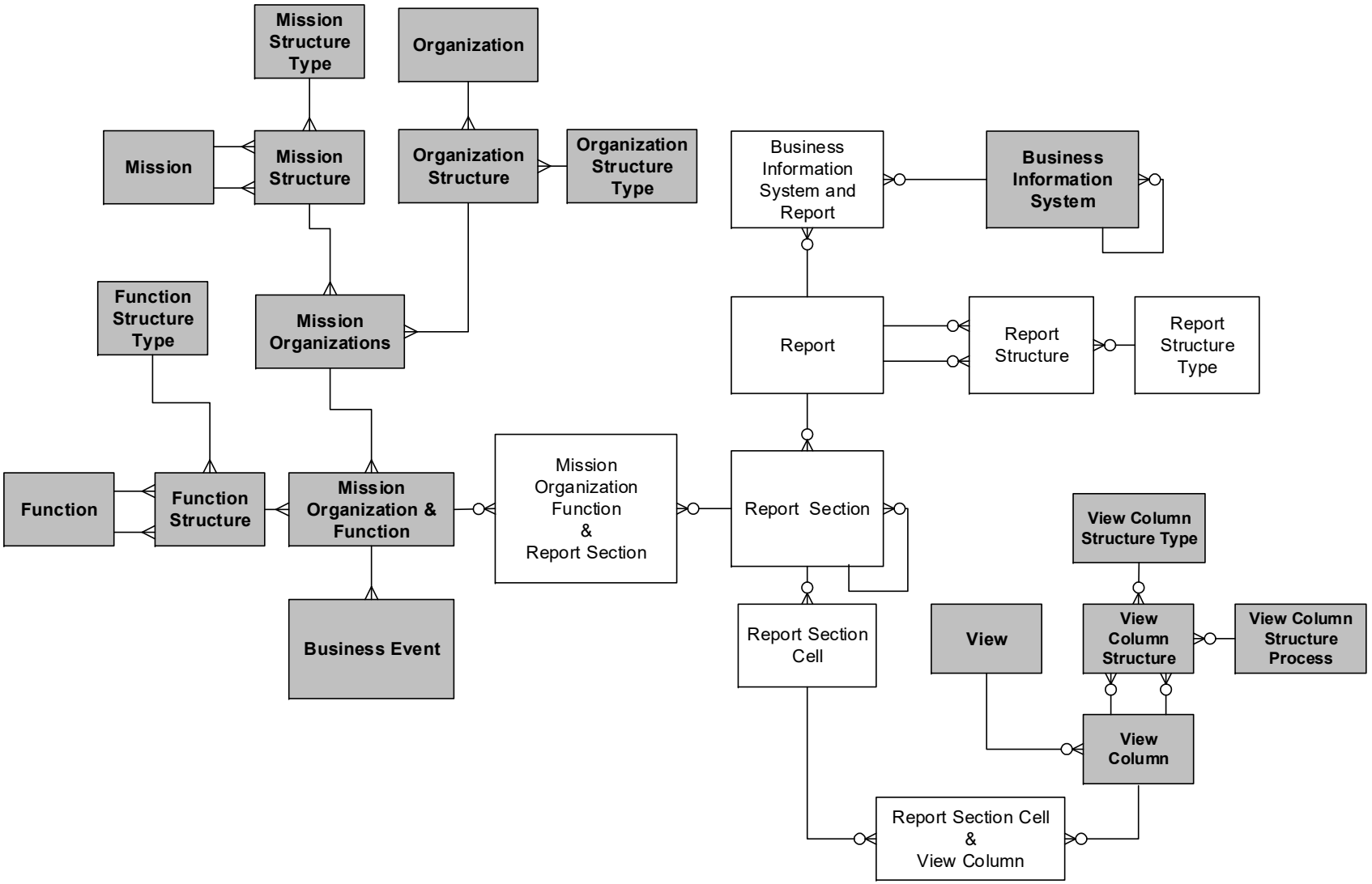
# Project Management



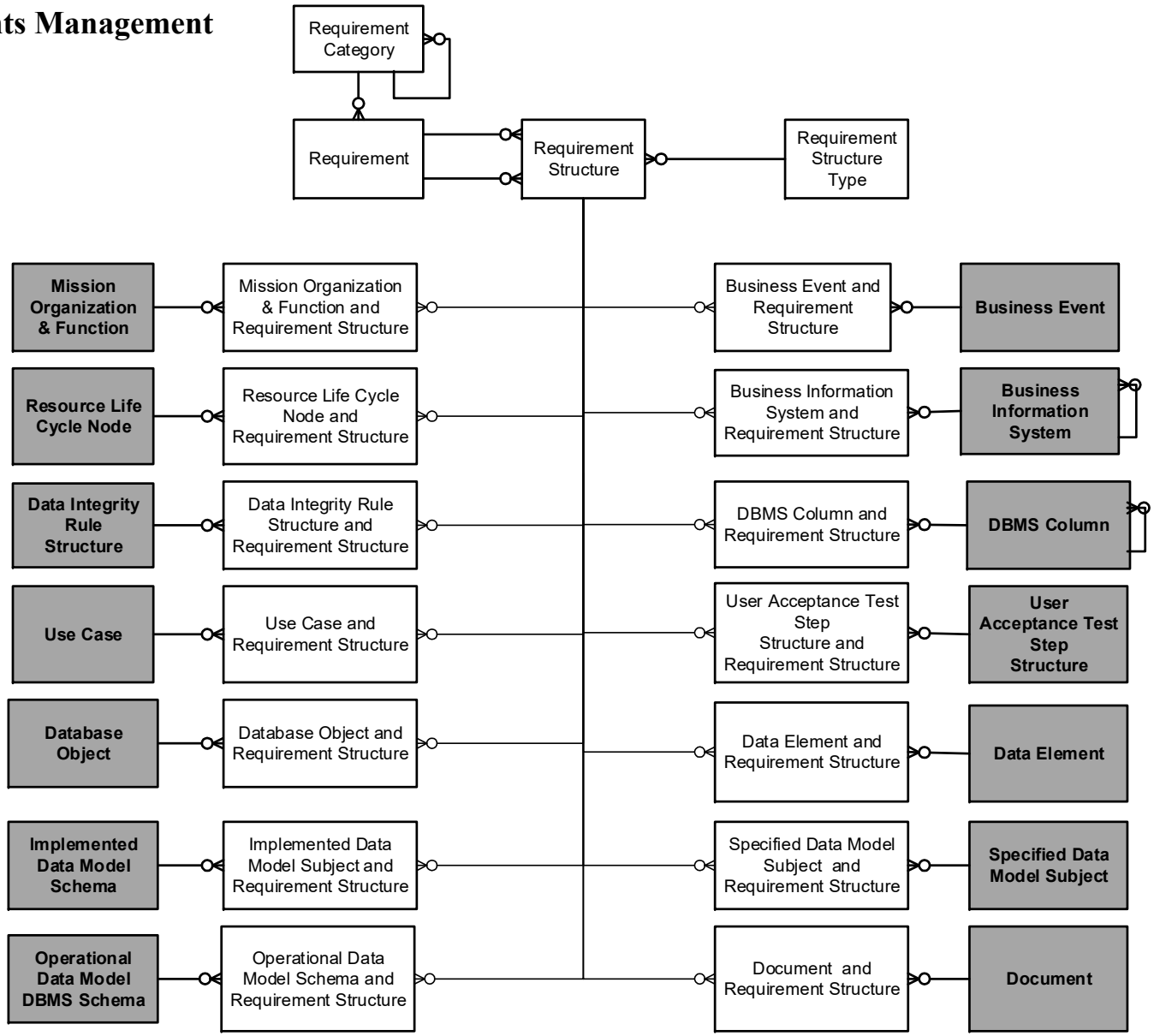
## Project Management (cont.)



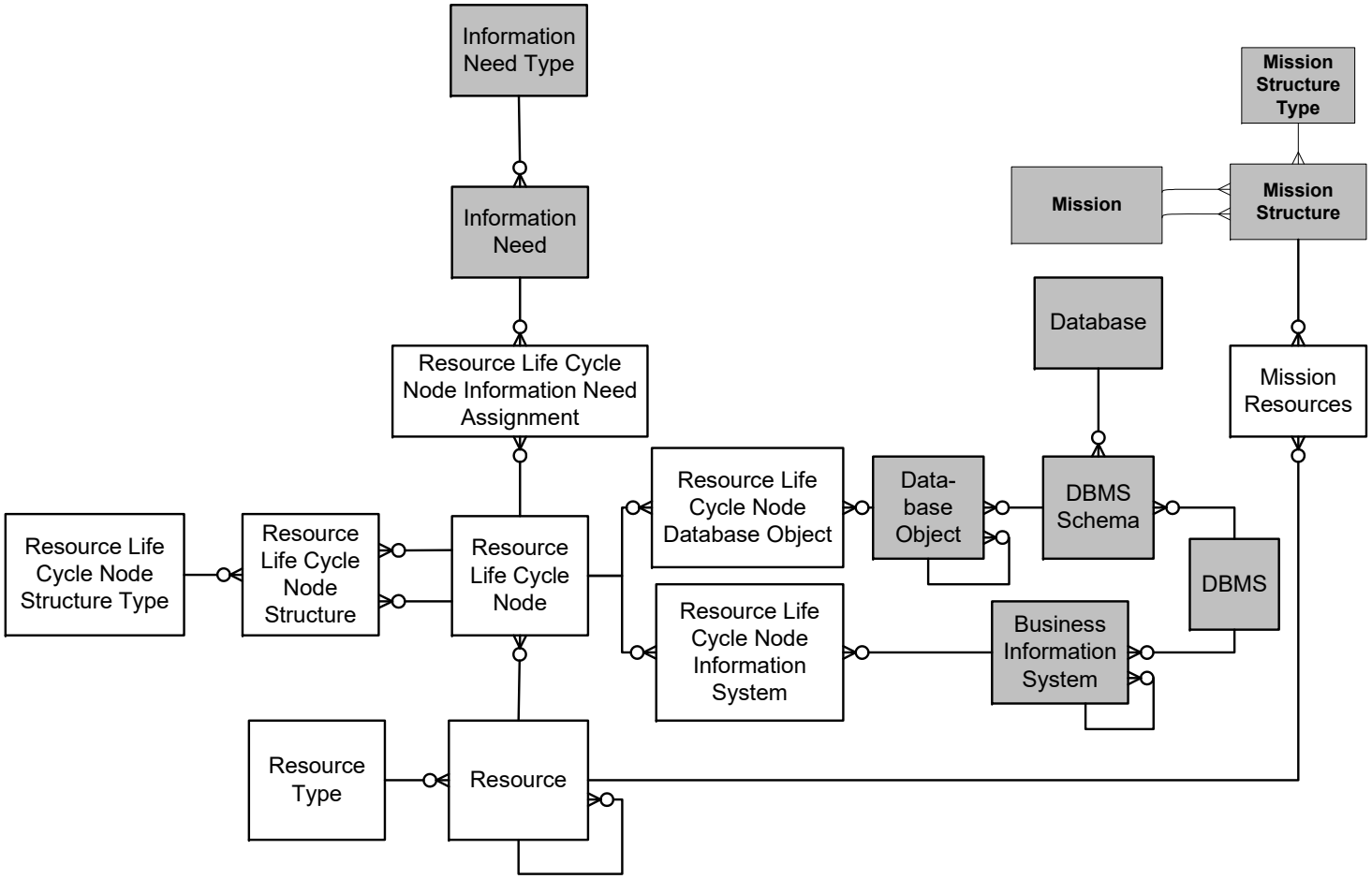
## Reports Management



## Requirements Management

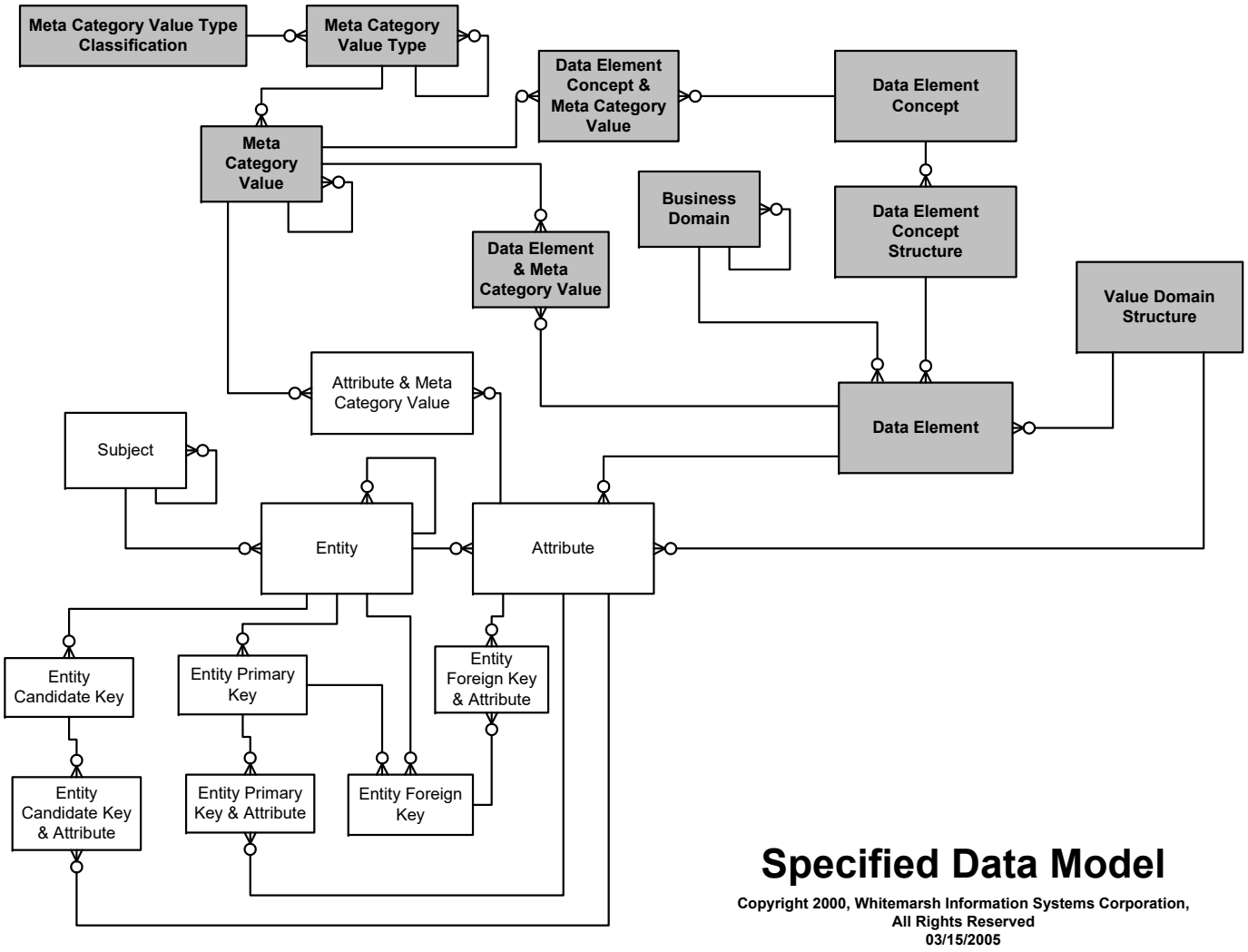


## Resource Life Cycle Analysis

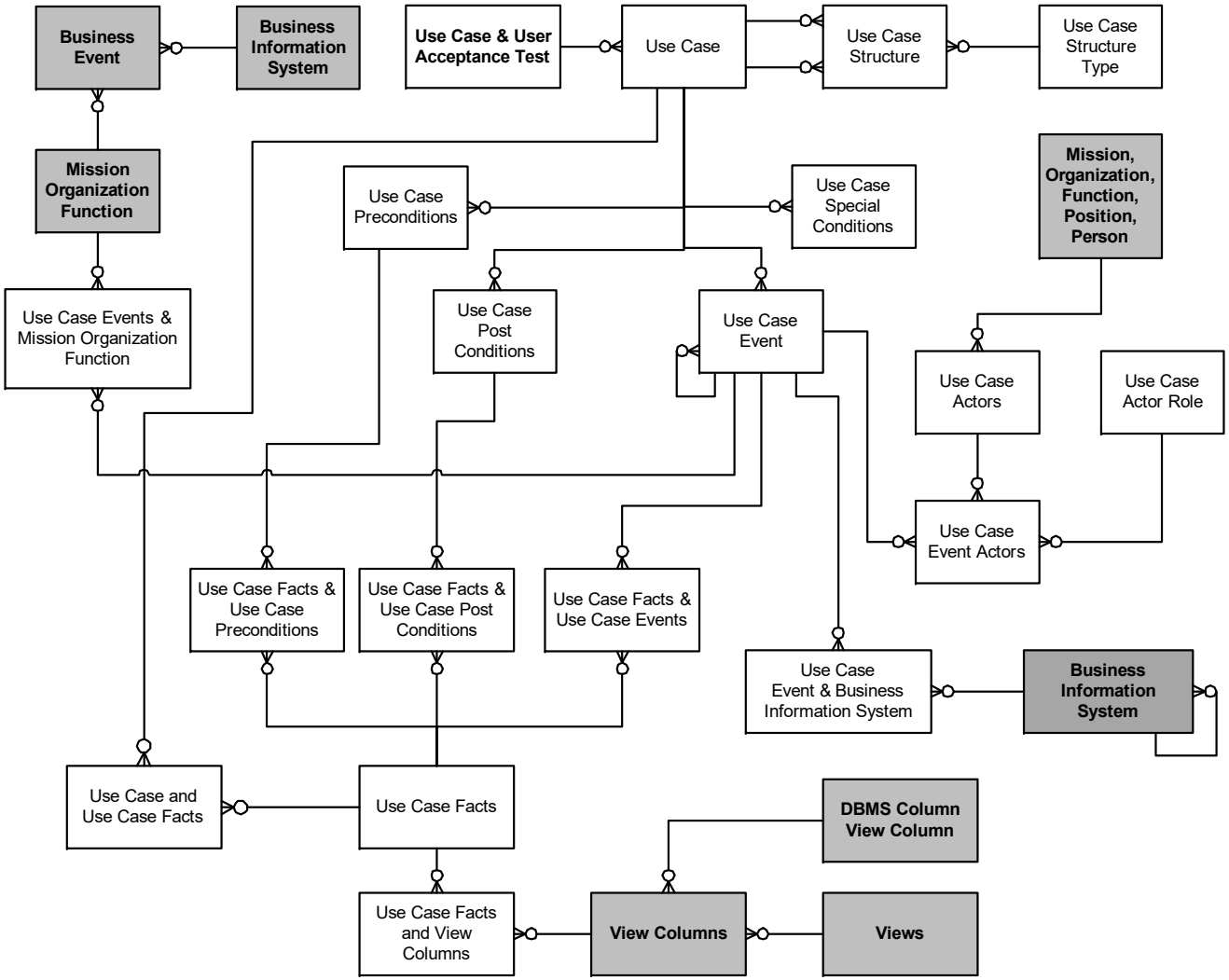



**Resource Life Cycle Analysis**

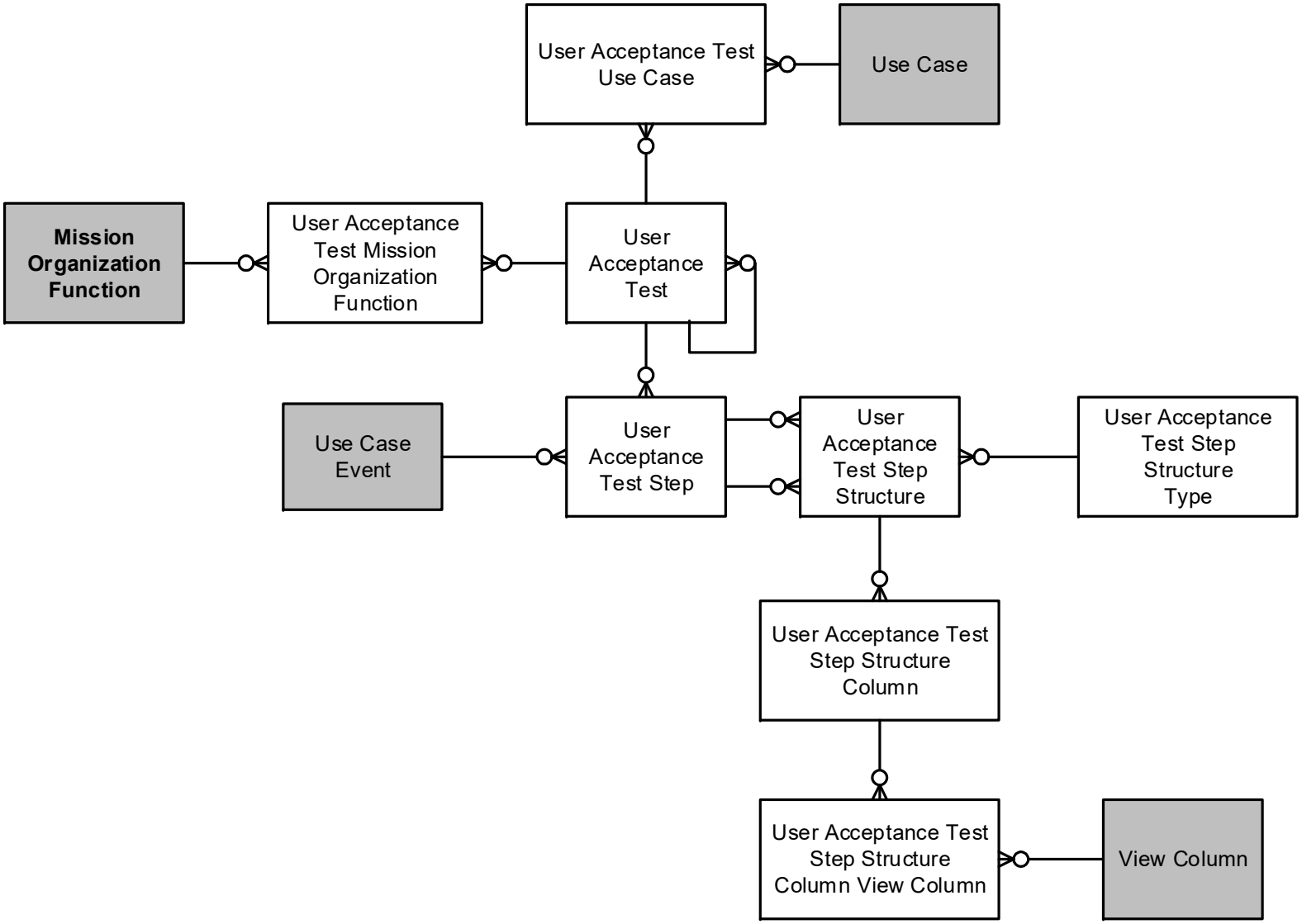
## Specified Data Model



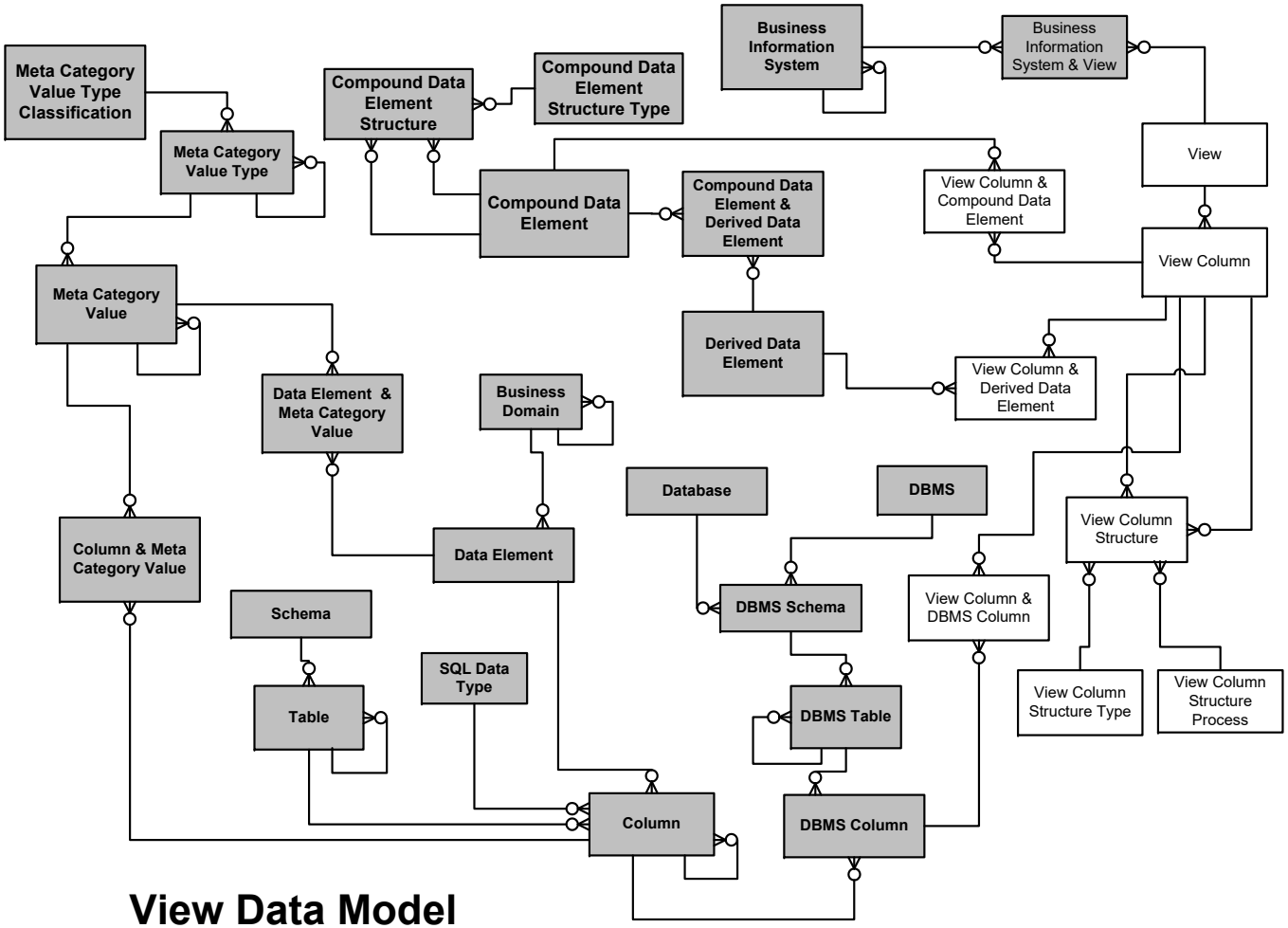
## Use Cases



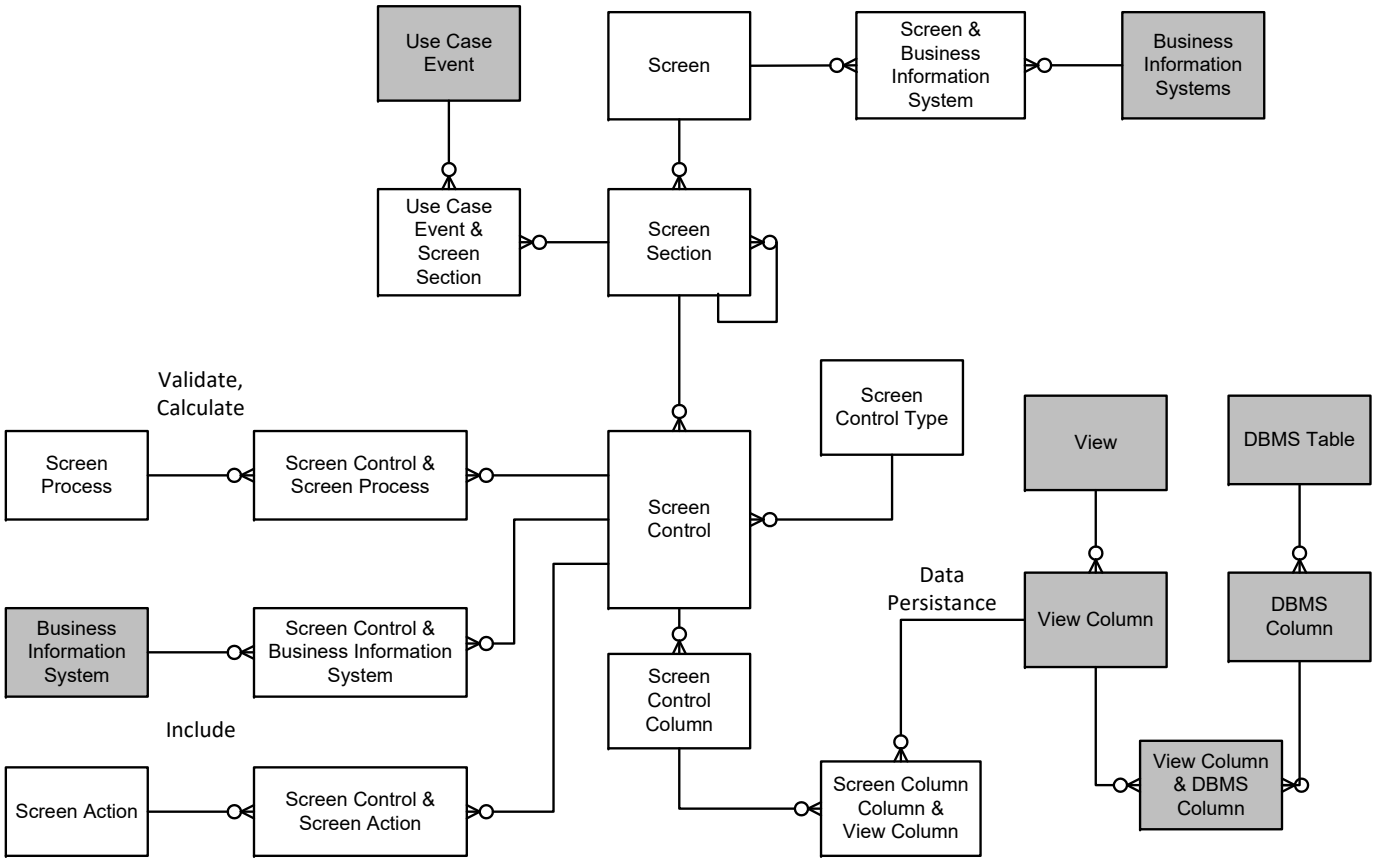
## User Acceptance Tests



## View Data Model



## Screens



# Publications

**Books** (listed in alphabetical order)

- Comprehensive Metadata Management
- Data Interoperability: Architecture and Concept of Operations
- Data Interoperability Community of Interest Handbook
- Data Management Concepts and Terms
- Data Modeler Architecture and Concept of Operations
- Data Semantics Management
- Data Standardization
- Database Management Systems: Understanding and Applying Database Technology
- Database Objects, The Foundation Stones for Enterprise Database
- DBMS Selection and Evaluation Questionnaire
- Enterprise Architectures
- Enterprise Database in a Client Server Environment
- Enterprise Governance
- Knowledge Worker Framework
- Managing Database: Four Critical Factors
- Repository Selection and Evaluation Questionnaire
- Strategy for Successful Development of Business Information Systems
- The Enterprise Database Framework
- The Information Systems Plan
- The Whitemarsh Methodology
- Whitemarsh Project Management

**Data Management and Business Information System Articles from The Data Administration Newsletter**
**www.tdan.com**

- A Column by Any Other Name is Not a Data Element
- A New Paradigm for Successful Acquisition of Information Systems
- A Strategy to Determine the Size and Cost of Database-
- And Where do XML Tags Come From? A Column by
- Business Event Management
- Centric Business Information Systems
- Challenge for Business Information System Success
- Comprehensive Metadata Management
- Data Architectures and the Interoperability Challenge
- Data is Executed Policy
- Data Model Evaluation Workplan
- Data Models: The Center of the Business Information Systems Universe
- Database Objects: The Foundation Stones of Enterprise Database
- Developing a Return on Investment
- Earned Value Management
- Enterprise Governance
- Enterprise-Wide Project Management
- Expensive Lessons from the Past: Profit from them.
- Frameworks, Metadata Repository & the Knowledge Worker
- Function Points
- Great News, The Relational Model is Dead
- Information Systems Development
- Information Systems Plan: The Bet your Business Project
- Integrated Metadata for Business Information Systems
- Is SQL a Real Standard Anymore?
- Iterations of Database Design
- Managing Names, Value Domains, Abbreviations and Definitions
- Modeling Data and Designing Databases

- Outsourcing: Scourge or Salvation?
- Rationale for Enterprise Governance
- Reference Data Management
- Tag and Post Vs. Data Standardization
- The Road to a Well-Ordered Enterprise is Through Metadata Management
- The Role of Government in IT Standards
- The Role of NIST in SQL Standardization
- Topology of Data Models within the Enterprise
- Valid RFP Development

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U.S. Army Office of the CIO
U.S. Army Tank Automotive Command
U.S. Department of Commerce
U.S. Department of Homeland Security IVV
U.S. Department of Homeland Security (Earned Value Management)
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U.S. DoD Office of Assistant Inspector General for Audits
U.S. DoD Strategic Defense Initiative Office
U.S. Department of Justice: US Marshals Service
U.S. Navy
U.S. Office of Personnel Management
U.S. Office of Trademarks