Whitemarsh
Information Systems Corporation

Enterprise Architectures

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Enterprise's Architecture

Chapter 3 was entirely focused on the Knowledge Worker Framework. It is within that framework that the architecture in this chapter and in the following chapters reside. The Knowledge Worker Framework is not just another framework. It has been crafted and evolved over many years and was inductively arrived at from very high quality database project methodolgoies.

This chapter, the Enterprise's Architecture, describes the contents of the enterprise's architecture and describes at a high level how the enterprise's architecture is created. This chapter also describes the work products, how they are interrelated, and how these work products fit with the work products of the other architectures.

4.1 The Enterprise's Architecture Scope

An enterprise's architecture is the engineering and structure of the enterprise's mission, organizations, functions and database domains so that they can be extended and/or integrated with other more technical architectures such as hardware, business information systems, and business events.

The title of this book is Enterprise Architectures. The title implies that the book is about the various classes of architectures that exist within the enterprise. This chapter describes the enterprise's architecture. Essentially, the first two rows of the Knowledge Worker Framework are the enterprise's architecture.

The enterprise's architecture from the point of view of the knowledge worker comes directly from rows 1 and 2 of the framework shown in Table 3. That is, the Scope and Business rows. There are many other architectures within the enterprise such as finance, products, location, and within information technology, there are architectures of hardware, and networks. All of these architectures would have similar rows, but probably different

columns. The column represents the different major product groupings about which the architecture is created.

4.2 The Enterprise's Architecture Components

A review of the products shown in Table 3, and then the row sections, 3.5.1 and 3.5.2 and then the Scope and Business rows of the column sections, 3.5.1 through 3.5.6 identify the enterprise's architecture products and explain their contents from both a row and column perspective.

Figure 10[7] depicts the Metabase high-level data model for storing the data contained in the enterprise's architecture. Table 8 enumerates and describes each of the components.

4.3 Enterprise's Architecture Process Flow

In the enterprise's architecture, the Missions, Business Organizations and Business Functions are all captured in their hierarchical manner. Missions and Business Organizations are then interrelated to make Mission-Organization pairs. Business Functions are related to the Mission-Organization pairs making valid triples, Mission-Organization-Function.

While not described in Table 3, it is also important to collect the management levels and positions and then related these to the various Mission-Organization-Function triples. Once the Missions are created, they can be cross referenced with the Business Organizations. No relevant organization should be without at least one mission. Else why have the organizations?

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[7] Throughout this book, the "line with arrow head" conventions are as follows: 1. A line from a component to itself with one arrow-head is a recursive relationship. Ex. Mission contains mission. 2) A line between a component and itself with an arrow head on both ends of the line is a network relationship. Ex. From Figure 17, a concept can contain multiple concepts, and a concept can be contained in multiple concepts. 3) A line between two components with a single arrow head is a one-to-many relationship. Ex. Mission has zero, one, or more Database Domains. 4) A line between two different components that has an arrow head at both ends represents a many-to-many relationship. Ex. Business event can involve many Business Information Systems, and a Business Information System can be involved in many Business Events.
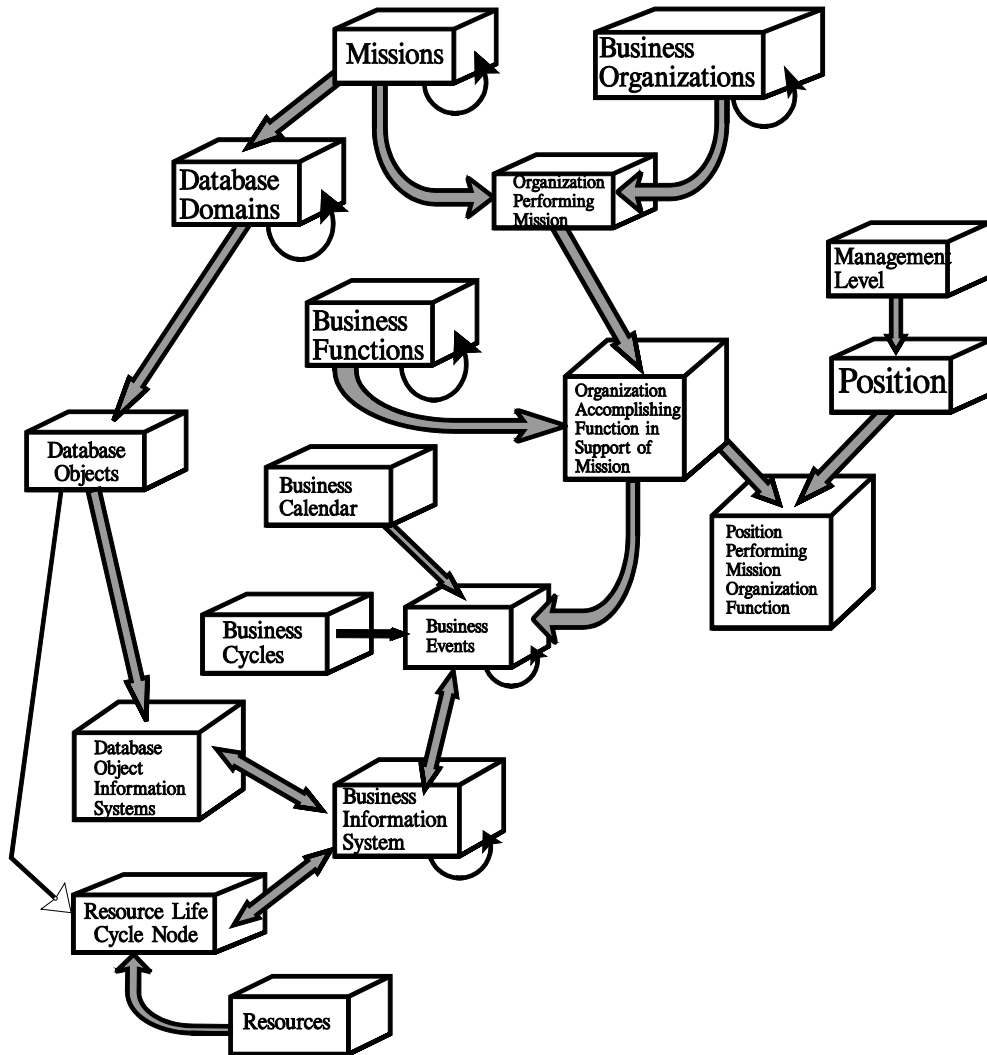
Figure 10. Enterprise architecture products and interrelationships.

Business Functions are also a good cross-reference check on the missions. Once the Missions, Organizations, and Business Functions are created and cross-referenced there should be a good view of the enterprise under study. It is common to have the Mission, Organization, and Business Function documents 25 or more pages each. All these hierarchically

organization textual descriptions and interrelationships should be entered into the Metabase so that all kinds of cross reference reports can be produced.

Once this is done, then missions should be analyzed to determine the various database domains. From the database domains the Database Object Classes are discovered.

Business iInformation systems that are relevant to the enterprise research area are identified and discovered. These business information systems need to be set within their calendar and business life cycles.

Another key component of the enterprise architecture is the identification of the Resources and their Resource Life Cycles.

Enterprise Architecture Components	
Name	**Description**
Business Events	A Business Event is an intersection between a business information system and a business function. A business event is a triggering event. It is invoked by the business function, and the business information systems execute in response. Business events may be set within business event cycles and calendar cycles, or both.
Business Organizations	An Organization is a unit within an enterprise. It is hierarchical so any quantity of organizational levels can be represented.
Business Cycle	A Business Cycle is a cycle during which business events occur such as financial reports, holidays, business planning and the like. A business cycle may be simple or complex. If complex, the business cycle actually consists of other business cycles as represented in the business cycle structure.
Business Calendar	A Business Calendar Cycle is a set of recurring calendar-based dates that are of interest to the enterprise. For example, quarterly, bi-weekly, monthly, daily, and the like. Business Calender cycles are linked to Business Events so that the timing of business event triggering can be known.
Business Functions	A Business Function is a set of hierarchically organization text that describes the activities performed by a position within an organization. Business functions are entirely human-based and if support is needed from a business information system then a business event is triggered. Business functions are independent of organizations and may be allocated to more than one business organization.

Enterprise Architecture Components	
Name	**Description**
Business Information Systems	A Business Information System is a computer-based business information system that is being managed through the Metabase. It is known by its characteristics, its operation cycles (business and calendar), subordinate business information systems, employed databases, views, and associated Resource Life Cycle nodes.
Database Domains	A Database Domain is a hierarchically organized set of noun-intensive descriptions associated with a mission leaf. Analyzed database domains lead to the identification of Database Object Classes, enterprise data elements, and property classes. Property classes, in turn, often become tables in databases.
Database Object Classes	A Database Object Class is a large collection of data and processes that are tied together for business-based reasons, and when instantiated, proceeds through well defined states. A database object can exist in two forms: a collection of interrelated database tables, or the set of a column-based nested structures within a table. The rows that comprise an object are transformed from one valid state to another via database object table processes and database object information systems. Database objects are related to one or more database domains.
Database Object Information Systems	A Database Object Information System is a collection of processes defined within the domain of the DBMS usually as a stored procedure that transforms one or more rows of a database object from one valid state to another. A database object information system accomplishes one or more database object table processes.
Management Level	Management level is a named and defined level of bureaucratic management within an organizational setting. Examples could be executive, senior, mid-level, and first-level.
Missions	Missions are hierarchically organized textual descriptions 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. An enterprise is incomplete if one of its missions is not defined. Not all enterprises accomplish their missions simultaneously or in an ideal state. Missions are accomplished over time and are subject to revisions.

Enterprise Architecture Components	
Name	**Description**
Organizations Performing Missions	An Organization Performing Missions, that is, a Mission-Organization is the association of an organization with a mission. There can be multiple organizations associated with a mission and an organization can be associated with multiple missions. The description contained within the Mission-Organization may be more refined than the description contained in either the mission or the organization.
Organizations Accomplishing Functions ...	An organization accomplishing a function in support of a mission, that is, a Mission-Organization-Function is the association of a mission-organization with a function. A mission-organization can be associated with multiple functions and a function can be associated with multiple mission-organizations. One or more mission-organization-functions may be associated with a business information system. When they are, business events are created.
Positions	A Position is a named and defined collection of work tasks that can be performed by or more persons. Positions are often assigned to one or more organizations.
Positions performing missions ...	A Mission Organization Function Position Role is the assignment of a position to a particular function within an organization as it accomplishes a mission. Once a position is assigned, its role can be described.
Resource Life Cycle Analysis Node	A Resource Life Cycle Node is a life cycle state within the resource. If the resource is employee, the life cycle node may be employee requisition, employee candidate, employee new hire, assigned employee, reviewed employee, and separated employee.
Resources	A Resource is an enduring asset of value to the enterprise. Included for example are facilities, assets, staffs, money, even abstract concepts like reputation. If a resource is missing then the enterprise is incomplete.

Table 8. Enterprise's architecture components.

Once these are all identified, described, and entered into the Metabase, the Database Object Classes and Resource Life Cycle nodes are intersected. Database Object Classes and Business Information Systems are interrelated though the creation of a Database Object Information System. Database Object Class details are discussed in the Database Object Classes architecture section.

The objective of the enterprise architecture effort is to clearly know what the enterprise is, what are its critical components, and to set all the descriptions of these components into their proper relationship with other components. Done completely, but at a reasonably high level, the enterprise's purpose and scope should be quite clear. These products become the foundation from which all databases and business information systems are identified and defined. These products also become the context for all policy specification, implementation, and adherence. Finally, these products become the context for all organizational and functional details. All these lower levels are shown in the System through Operations rows of Table 3.

4.4   Enterprise's Architecture Summary

The objective of this chapter was to describe the first of the contained architectures, the enterprise's architecture. It is fitting that this architecture is accomplished first as this architecture provides context for all the other architectures. However, if other architectures are done in parallel, that's acceptable just so long as the work products that exist across the architectures are reconciled. While there may be overlapping work products there must only be one definitive set. For example, if there's a Resource and one or more of its Resource Life Cycle nodes cannot be discovered from within the enterprise's missions, then an analysis error has been made. Such errors must be resolved.

This chapter also identified and described all the component parts of the enterprise's architecture, and also set out the high-level process flow that creates the enterprise's architecture.

Chapter 5, Database Object Classes, defines what a Database Object Class is, how it contrasts with other types of objects, and what unique role Database Object Classes play in a database environment. Chapter 5 also presents how Database Object Classes can be implemented in SQL DBMSs that are not object-oriented and how these classes can be implemented in SQL:1999 and above compliant DBMS which are object-oriented. Finally, Chapter 5 describes the work products, how they are interrelated, and how these work products fit with the work products of the other architectures.

4.5   Questions and Exercises

1.   What has been your experience with developing and using an enterprise's architecture? If good, how and what have been its benefits to strategic, tactical and operational work environments?

2.   What's the effect of an enterprise's architecture on your projects? Is the enterprise's architecture followed as a controlling guidance? If yes, why and what have been the benefits and drawbacks? If not, what was used as the context to justify a project?

3.   How often do you update your enterprise's architectures? Why is it updated? Is it an all or nothing update process? Can there be incremental updates to part of an architecture?

4.   Do "outsiders" accomplish your enterprise's architectures? If yes, why? What are the benefits? If no, what have been the benefits or drawbacks? Is there "ownership" if an "outsider" does your enterprise's architectures?

5.   Figure 10 shows the components and relationships in the enterprise's architectures. Do you agree with these? Too many? Too few? Please explain your answer.

6.   Should the effort to develop/update and enterprise's architecture be woven information technology the yearly planning cycle? If so, how? Is your organization engineered to participate in these efforts?

7.   Are "systems" built that are not justified by the enterprise's architectures? Who makes the case for the exceptions? Or, are exceptions the rule? What happens to the credibility of the enterprise's architectures if they are not followed?

8.   Can you see how to tell "stories" with the enterprise's architecture components? Are stories/scenarios an effective tool? If yes, why? If not, why not?