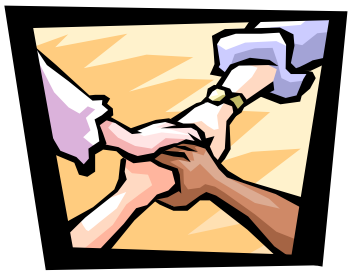
ACTION LEARNING SCENARIO #3

Implementing Federal Enterprise Architecture within the USGS:
Charting the Future for the Survey



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Implementing Federal Enterprise Architecture within the USGS:

Charting the Future of the Survey

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ISSUE:

The USGS conducts research, monitoring, and assessments to contribute to our understanding of the natural world – our lands, water, and biological resources. As the environment and technology change over time, the USGS must ensure that an efficient and effective organization supports its scientific and administrative programs. Modernizing organization and information infrastructures requires structured business planning and effective change management. These requirements can be fulfilled through the creation of an Enterprise Architecture (EA) that links an organization's Business Processes, Performance, Services, and Technologies.

Once developed, enterprise architecture can be used to identify and resolve misalignments among processes, information, applications, technology, and organization. This gap analysis can lead to an understanding of how business processes might be re-engineered or how information systems might be redesigned.

Enterprise architecture can be used to capture the strategic intent of an organization and provides the means for modeling, and sharing new visions. The discipline required by the EA approach assures that any new vision will:

- Consider all associated business functions,
- Address misalignments or missing business functions,
- Consider information systems, data flow as well as data storage, and
- Ensure that technology needs have been considered and mapped into the new vision.

A quote from the General Accounting Office (GAO):

"A well-defined enterprise architecture provides a clear and comprehensive picture of the structure of any enterprise, whether it is an organization or a functional or mission area. This structure is defined in models that describe (in both business and technology terms) how the entity operates today and how it intends to operate in the future; it also includes a plan for transitioning to this future state. Such an architecture is an essential tool for leveraging information technology (IT) in the transformation of business and mission operations. Attempting to modernize and evolve organizations and IT environments without an enterprise architecture to guide and constrain investments often results in operations and systems that are duplicative, not well integrated, unnecessarily costly to maintain and interface, and ineffective in supporting mission goals. A properly managed enterprise architecture helps to clarify and optimize the interdependencies and relationships among enterprise operations and their supporting IT assets, so that agencies can base IT investment decisions on an explicit and common understanding of both today's and tomorrow's environments."

CHALLENGE:

The development, implementation, and maintenance of architectures is required by the Clinger-Cohen Act and the implementing guidance issued by the Office of Management and Budget (OMB). Further, the E-Government Act of 2002 assigns OMB responsibility for overseeing the development of enterprise architecture Government-wide.

In accordance with the Federal mandates described above, the Department of Interior has embarked on a department-wide enterprise architecture project. In FY2004, the department has identified 5 cross-cutting business lines which will be documented and evaluated under its EA project. They are:

1. Law Enforcement
2. Recreation
3. Fire Management
4. Indian Trust Management, and
5. Financial Management

The challenge is to assess the future of the Enterprise Architecture Initiative. The specific questions for the action learning team to address are:

- *How should the Federal Enterprise Architecture initiative be implemented within the USGS?*
- *How can the USGS use the Federal Enterprise Architecture initiative to advance its Science and Information Technology Programs?*
- *How should USGS scientists and managers be engaged in this process?*
- *What are the barriers to the successful implementation of EA at USGS?*
- *What performance measures could be used to demonstrate the effectiveness of the EA within USGS?*

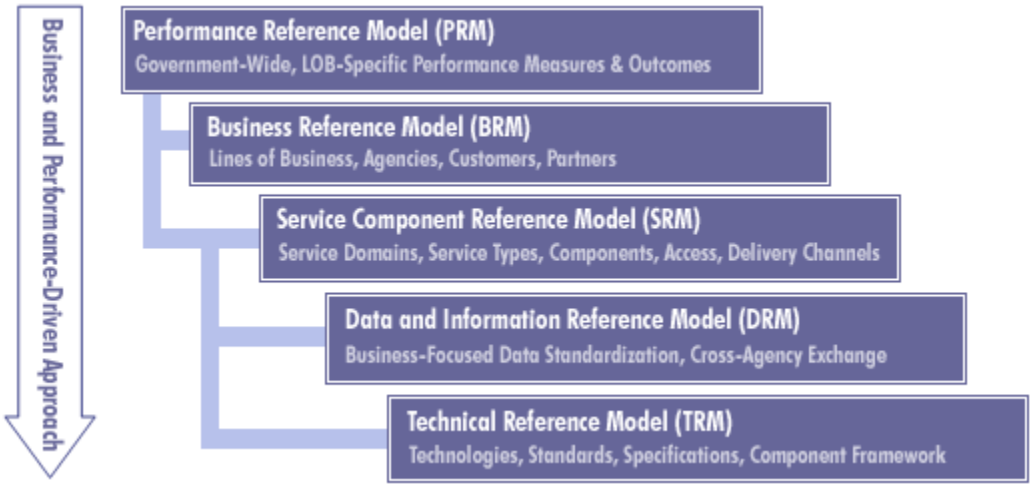
BACKGROUND:

On February 6, 2002 the development of a Federal Enterprise Architecture (FEA) commenced. Led by OMB, the purpose of this effort was to identify opportunities to simplify processes and unify work across the agencies and within the lines of business of the Federal Government. The outcome of this effort will be a more citizen-centered, customer-focused government that maximizes technology investments to better achieve mission outcomes.

What is the Federal Enterprise Architecture (FEA) ?

To facilitate efforts to transform the Federal Government to one that is citizen-centered, results-oriented, and market-based, the Office of Management and Budget (OMB) developed the Federal Enterprise Architecture (FEA), a business-based framework for Government-wide improvement.

The FEA is being constructed through a collection of interrelated "reference models" designed to facilitate cross-agency analysis and the identification of duplicative investments, gaps, and opportunities for collaboration within and across Federal Agencies.



These models are defined as:

- Performance Reference Model (PRM)
- Business Reference Model (BRM) v2.0
- Service Component Reference Model (SRM)
- Data and Information Reference Model (DRM)
- Technical Reference Model (TRM)

A business-drive approach:

In contrast to many failed "architecture" efforts in the past, the FEA is entirely business-driven. Its foundation is the Business Reference Model, which describes the government's Lines of Business and its services to the citizen independent of the agencies and offices involved. This

business-based foundation provides a common framework for examining business functions across Government.

A HISTORICAL PERSPECTIVE:

The concept of an architecture to describe an enterprise first emerged in the mid-1980s, and over the years, various frameworks for defining the content of enterprise architectures have been published. Organizations in the early 1990s identified enterprise architectures as critical success factors in allowing organizations to effectively apply IT to meet mission goals. Since then the Congress, OMB, and the federal Chief Information Officers (CIO) Council have promoted the importance of enterprise architectures and have required that agencies in develop, maintain, and use them.

Enterprise Architecture: A Brief Description

In simple terms, an enterprise can be viewed as any purposeful activity, and an architecture can be characterized as the structure (or structural description) of any activity. Building on this, enterprise architectures can be viewed as systematically derived and captured structural descriptions—in useful models, diagrams, and narrative—of the mode of operation for a given enterprise, which can be either a single organization or a functional or mission area that transcends more than one organizational boundary (e.g., financial management, homeland security). The architecture describes the enterprise's operations in both logical terms (such as interrelated business processes and business rules, information needs and flows, and work locations and users) and technical terms (such as hardware, software, data, communications, and security attributes and performance standards). It provides these perspectives both for the enterprise's current (or "as-is") environment and for its target (or "to-be") environment, as well as a transition plan for moving from the "as-is" to the "to-be" environment.

The Importance of Enterprise Architectures

The importance of enterprise architectures is a basic tenet of IT management, and their effective use is a recognized hallmark of successful public and private organizations. For over a decade, the General Accounting Office (GAO) has promoted the use of architectures, recognizing them as a crucial means to a challenging goal: that is, agency operational structures that are optimally defined, in terms of both business and technology. The alternative is the perpetuation of the kinds of operational environments that saddle most agencies today, in which the lack of integration among business operations and the IT resources that support them leads to systems that are duplicative, not well integrated, and unnecessarily costly to maintain and interface.

Managed properly, an enterprise architecture can clarify and help optimize the interdependencies and relationships among an organization's business operations and the underlying IT infrastructure and applications that support these operations. Employed in concert with other important IT management controls (such as portfolio-based capital planning and investment control practices), architectures can greatly increase the chances that organizations' operational and IT environments will be configured so as to optimize mission performance. Enterprise architectures are integral to managing large-scale programs as well as initiatives that span several

agencies, such as those currently being undertaken to support the electronic government (e-government) efforts led by OMB.

Enterprise Architecture Frameworks and Management Guidance

During the mid-1980s, John Zachman, widely recognized as a leader in the field of enterprise architecture, identified the need to use a logical construction blueprint (i.e., an architecture) for defining and controlling the integration of systems and their components. Accordingly, Zachman developed a structure or framework for defining and capturing an architecture, which provides for six "windows" from which to view the enterprise. Zachman also proposed six abstractions or models associated with each of these perspectives. Zachman's framework provides a way to identify and describe an entity's existing and planned component parts, and the relationships between those parts, before the entity begins the costly and time-consuming efforts associated with developing or transforming itself.

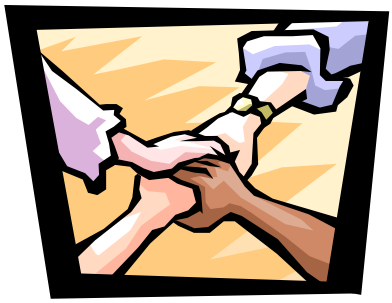
Since Zachman introduced his framework, a number of frameworks have emerged within the federal government, beginning with the publication of the National Institute of Standards and Technology (NIST) framework in 1989. Since that time, other federal entities have issued enterprise architecture frameworks, including the Department of Defense (DOD) and the Department of the Treasury. In September 1999, the federal CIO Council published the Federal Enterprise Architecture Framework (FEAF), which was intended to provide federal agencies with a common construct for their architectures, thereby facilitating the coordination of common business processes, technology insertion, information flows, and system investments among federal agencies. The FEAF describes an approach, including models and definitions, for developing and documenting architecture descriptions for multiorganizational functional segments of the federal government. More recently, OMB established the Federal Enterprise Architecture Program Management Office to develop a Federal Enterprise Architecture (FEA) according to a collection of five "reference models," which are intended to facilitate governmentwide improvement through cross-agency analysis and the identification of duplicative investments, gaps, and opportunities for collaboration, interoperability, and integration within and across government agencies. Although these post-Zachman frameworks differ in their nomenclatures and modeling approaches, each consistently provides for defining an enterprise's operations in both logical terms and technical terms, provides for defining these perspectives for the enterprise's current and target environments, and calls for a transition plan between the two.

Several laws and regulations have established requirements and guidance, respectively, for agencies' management of architectures, beginning with the Clinger-Cohen Act in 1996, which directs the CIOs of major departments and agencies to develop, maintain, and facilitate the implementation of IT architectures as a means of integrating agency goals and business processes with IT. OMB Circular A-130, which implements the Clinger-Cohen Act, requires that agencies document and submit their initial enterprise architectures to OMB and that agencies submit updates to OMB when significant changes to their enterprise architectures occur. The circular also directs the OMB Director to use various kinds of reviews to evaluate the adequacy and efficiency of each agency's compliance with the circular.

OMB was given explicit responsibility for overseeing government enterprise architectures by the E-Government Act of 2002, which established the Office of Electronic Government within OMB. This act gives OMB the responsibility for facilitating the development of enterprise architectures within and across agencies and supporting improvements in government operations through the use of IT.

Suggested Reading:

- GAO Report assessing Enterprise Architecture in the Federal Government (one reference copy for the team)
- Federal Enterprise Architecture Overview (attachment)



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