

Interior Enterprise Architecture

Common Requirements Vision

Introduction and Background	2
Environmental Trends	3
Business Strategies	5
Business Drivers	7
Business Information Requirements	8
Requirements for Technical Architecture	10
Example of How Requirements for Technical Architecture Evolve.....	12
Value of the Common Requirements Vision.....	13



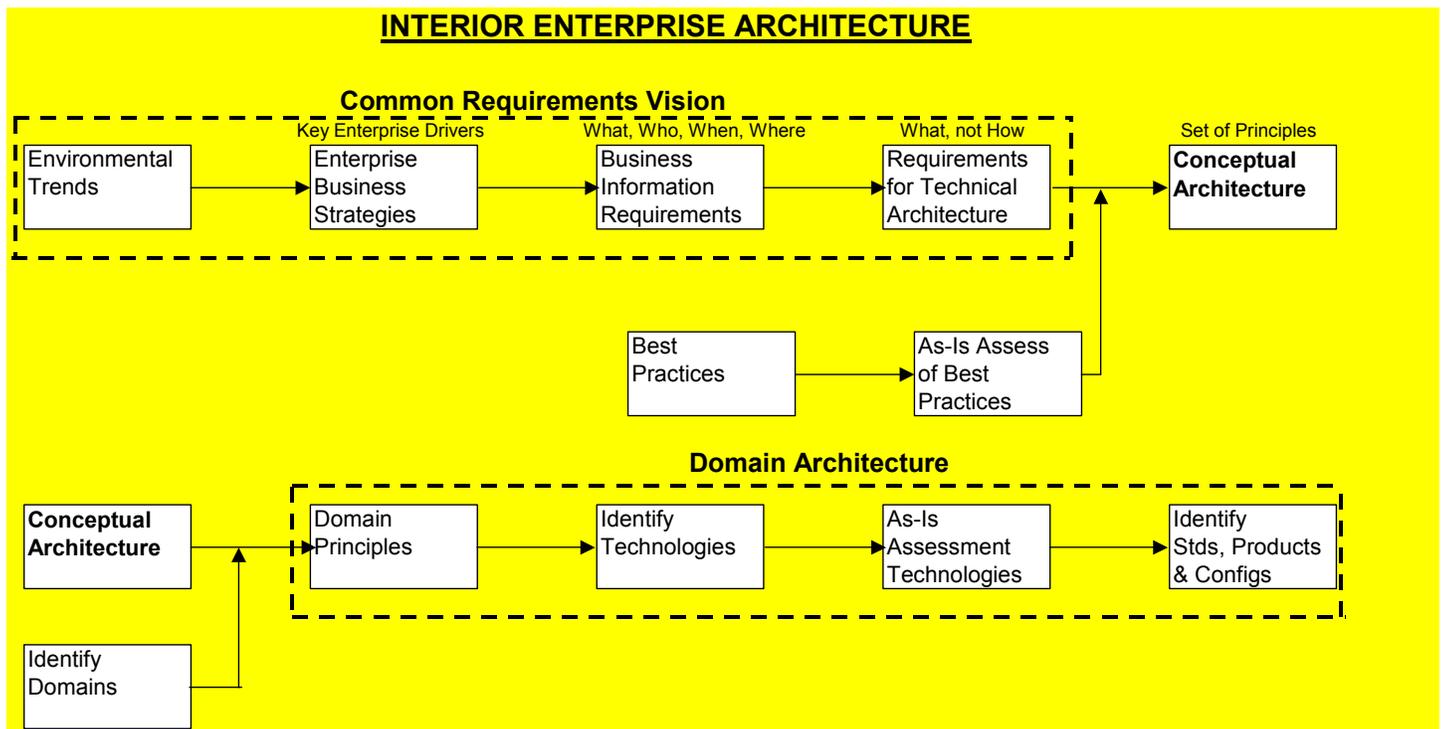
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Introduction and Background

The Clinger-Cohen Act of 1996 requires the heads of Federal agencies to link information technology (IT) investments to agency accomplishments, and to establish a process to select, manage and control these agency investments. To meet this requirement, the Office of the Chief Information Officer (OCIO) is creating an Interior-wide enterprise architecture. An enterprise architecture is an integrated framework and governance process for managing and evolving IT while meeting strategic and information resource management goals.

To be successful, the architecture must be derived from business requirements and be understood and supported by IT senior management and the heads of the Bureaus. Information technology does not exist for its own purposes; rather it exists to support the needs of business users. Accordingly, the first major piece of the architecture process is the Common Requirements Vision (CRV). This vision document is used to ensure that Interior's IT products and services are aligned with the business community's strategic direction. It is also the necessary predecessor to the creation of the Conceptual Architecture, which will be a logically consistent set of principles that are derived from these business requirements and will be used to guide the engineering of the organization's information systems and technology infrastructure. In essence, the architecture is the DNA necessary for the successful growth and development of technology within Interior.

Below is a simplified graphic of the process used to create the CRV, the Conceptual Architecture, and eventually the full Interior Enterprise Architecture.



Environmental Trends

The first step for the architecture team was to identify influencing environmental trends; that is the major internal and external forces (e.g., policies, regulatory changes) and the important technological trends that can impact Interior's business and program strategies. This information came from a combination of sources: the bureaus' and department's strategic plans, interviews with management, and research from the META Group's government strategies service. The team then reduced these to common or shared trends. For ease of review, these trends have been grouped together by focus. These are: Policy, General Public "facing", Interior Organization and Technology.

Policy focus

- ET-1) Increasing legislative pressure and administrative requirements for inter-government systems interoperability and coordination with end goal of unobstructed information.
- ET-2) Increasing focus on strategic planning, performance measurements, and budget alignment by the Federal Government (e.g., Government Performance and Results Act (GPRA)).
- ET-3) Increasing need for legislative clarity around the politics of public sector information - charging for service, information sharing, privacy, and equal access - because of impediments current laws bring to E-government. Data and information from the private and commercial sector has proprietary and privacy issues; legislation needs to be forthcoming that balances these issues with the public's right to information.
- ET-4) Growing use of comprehensive packaged solutions by government organizations because resulting systems are integrated and facilitate business process improvements.

General Public "facing" focus

- ET-5) Growing use of E-government services provided via a single point of entry that increasingly cuts across bureau boundaries.
- ET-6) Increasing need to assure the public's trust in the services and activities of government organizations as automation use increases.
- ET-7) Increasing demand by elected officials and the public for easy electronic access to many routine government services.
- ET-8) Increasing demand by the public and commercial enterprises for access to Interior information.

Interior Organization focus

- ET-9) Decreasing number of skilled workers available for Interior positions without a corresponding decrease in the volume of work.
- ET-10) Increasing need for quick and easy sharing of information with multiple organizations (i.e., Federal, state, local and tribal governments, private organizations & business) collaborating on common goals.
- ET-11) Continuing advancements in wireless connectivity and voice recognition will enable government personnel to spend more time in the field using a "location-less office" with access to organization-wide information resources.

Technology focus

- ET-12) Increasing need for faster, more complete access to information by Interior personnel to improve service delivery, worker productivity, and management of public resources.
- ET-13) Increasing demand for the capture, electronic storage, delivery, and archiving of Interior resources (including those that are currently paper-based).
- ET-14) Growing gap between the cycles of technology evolution and the planning, budgeting and procurement cycle within government (e.g., acquisitions are often obsolete before deployment).

Business Strategies

The architecture team then identified the list of business responses to these major environmental trends. This information came from a review of the bureaus and department Strategic plans, the bureaus' Annual Performance Plans and interviews with select bureau management. These strategies represent those cross-Interior responses that the organization will use to effectively deal with the shared environmental trends. Like the environmental trends, these strategies have been grouped by focus for ease of analysis.

Policy focus

- S-1) Increase analysis of interim data including preparation of quarterly financial statements to assist in the analysis of financial information throughout the year.
- S-2) Ensuring that the scientific programs focus on understanding, assessing, and monitoring resources and ecosystems to provide scientific understanding and technologies needed to support sound land and resource management decisions.
- S-3) Utilize technology to increase efficiency and expand collection of natural science data and establish and maintain national Earth and biological science databases for use by Federal, state, and local land management and regulatory agencies.

General Public “facing” focus

- S-4) Utilize and implement E-government.
- S-5) Offer “one-stop shopping” for Interior information and services through an interagency Federal web site, (e.g., recreation services through “Recreation.Gov.”).
- S-6) Engage in long-term monitoring and forecasting, short-term prediction, real-time monitoring and communication with civil authorities and others during a crisis (e.g., adding earthquake sensor reporting in real time, forest fire monitoring, etc.)
- S-7) Work to offer appropriate Interior transactional services via the internet (e.g., like existing on-line wild horse adoptions.)
- S-8) Implement an Interior-wide customer feedback system.

Interior Organization focus

- S-9) Incorporate enterprise architecture approaches that are flexible, allow systems growth, and logically fit Interior work needs (e.g., Financial System, Land Management System).
- S-10) Utilize appropriate technologies to support management objectives.
- S-11) Explore and utilize delivery and collaboration methodologies to help satisfy training requirements (e.g. web, computer-based training (CBT), video conferencing, etc.)
- S-12) Improve access to technical assistance (e.g., the new central web site which is a clearinghouse on policies, standards, training and technical assistance.)
- S-13) Provide an integrated information (Interior-wide) architecture process and structure that directly supports Interior’s mission and business information management requirements.
- S-14) Improve technical tools including adoption of Interior-wide financial data consolidation software to ensure that the same data is used for all reporting.

Technology focus

- S-15) Improve data management systems (e.g., policy and procedures relating to data standards, data privacy, data security, etc.)
- S-16) Encourage innovation in our products and services by keeping abreast of and applying new technologies and work practices.
- S-17) Utilize new collections management software to improve the efficiency of inventory data entry and management.
- S-18) Develop reusable, consistent, and sharable components (e.g., standards, guidelines, procedures, etc.) for the Information (Interior-wide) Architecture Service Areas.
- S-19) Complete implementation of an off-the-shelf software product with improved functionality and ad-hoc report capabilities to enable Interior to consolidate tracking of materiel weaknesses (both programmatic and financial management), and OIG, GAO and Single Audit recommendations, and provide for direct bureau updates on the status of corrective action and implementation activities.

Business Drivers

Once the important trends and business strategies had been determined, the architecture team then developed the *business change drivers*. Each Business Driver is a "theme" that represents a related set of environmental trends and business strategies. These become the IT and business objectives or activities that **must** be accomplished and done **well**.

- BD-1) Leverage the Internet to support Interior's business, as appropriate.
- BD-2) Provide easy, reliable, and secure access to appropriate information and services for all interested parties. Assure that the information is complete, timely and accurate.
- BD-3) Provide sound stewardship of mission related programs and associated resources to ensure accountability for Interior performance.
- BD-4) Utilize flexible Interior and contractor personnel and workplace options to address current and future needs for skilled employees and the need to increase their effectiveness (e.g., enhance productivity).
- BD-5) Provide for increased sharing of information and computer applications/ systems for efficiency and effectiveness.
- BD-6) Provide for increased partnerships with the private sector, universities, tribes, non-profits, and other government organizations.
- BD-7) Significantly improve the IT procurement process, computer systems development, implementation and application roll out processes.
- BD-8) Improve critical business processes to make them faster, more reliable, flexible, and cost-effective while improving the quality of services that customers receive.
- BD-9) Provide policy makers and senior managers with quality and essential information for decision-making.

Business Information Requirements

The architecture team then identified the information required by the business decision-makers and activities needed to satisfy the Business Drivers:

- **WHAT** information is needed?
- **WHO** needs it?
- **WHEN** (how often) is it needed?
- **WHERE** does it come from?

BIR-1) Provide anytime, anywhere access to all appropriate Interior systems, information and services, as soon as practical.

BIR-2) Publish the rules and guidelines for the disclosing of Department information to all interested parties through multiple technologies.

BIR-3) Provide secure and electronic access to systems and information (both real time and summary) maintained by other Federal, State, or local partners.

BIR-4) Design and build applications that use web technology (when appropriate) to make services more accessible and easier to use.

BIR-5) Enable the identification, maintenance and consolidation of business related information about parties with whom Interior conducts business.

BIR-6) Provide an easily accessible directory of available information across Interior (e.g., what it is, where it is, its currency).

BIR-7) Use the Internet to facilitate the acquisition of goods and services and property disposal.

BIR-8) Provide a single, secure login to authorize access to appropriate Interior information and services.

BIR-9) Provide an easy and consistent user experience in accessing systems and information through multiple technologies.

BIR-10) Provide common information in consistent ways (e.g., language of requestors, 'plain' languages, comprehensible).

BIR-11) Provide program-monitoring information to staff to assess progress in carrying out legislative intent, meeting established performance goals and targets, and to properly measure program performance.

BIR-12) Provide management with necessary resource & demand information to enable timely, flexible and accurate workforce decisions from internal and external resources.

BIR-13) Provide Interior-wide skills inventory information to bureau management.

BIR-14) Provide electronic means as an option for training of existing staff .

BIR-15) Provide a means to make Interior business information available to support work when outside of the office.

BIR-16) Provide for electronic identification and authorization, (e.g., "digital signatures").

BIR-17) Provide the means to automate the monitoring and modeling of business/ program processes and the information used by those processes.

- BIR-18) Provide the ability to utilize common business processes across Interior.
- BIR-19) Provide for substantial increases in data quantity and demand for the data.
- BIR-20) Provide the means to determine and analyze the IT impact of legislative and regulatory requirements.
- BIR-21) Provide means of sharing information across organizational boundaries both internal (e.g., within and across bureaus) and external (e.g., suppliers, providers).
- BIR-22) Provide for increased use of structured workflow (e.g., routing and approval).
- BIR-23) Ensure that information is made available while securing Interior assets and personal privacy (e.g., constituent confidentiality).
- BIR-24) Provide for increase in telecommunications capacity requirements (e.g., voice and data) and need for continual monitoring of the network.

Requirements for Technical Architecture

The final step in the Common Requirements Vision portion of the process is to translate the business information requirements into requirements for technical architecture; that is:

- **WHAT** is required of the technical architecture to support the business information requirements,
- **NOT HOW** the requirements will be satisfied.

These architecture requirements begin transitioning the plan from a “business (program) context” to an “IT (technical) context.” These requirements, along with the Conceptual Architecture, will provide guidance to the technical communities as they establish standards, policies, etc., that will guide their technical domains (e.g., Networks, Data) as expressed in their Technical Reference Models (TRMs).

RTA-1) The IEA will support a shared data, information, and records infrastructure environment that provides flexible access to a consolidated data source. Data will be defined by standard definitions stored in a common repository and will be maintained by clearly identified data stewards.

RTA-2) The IEA will provide the ability to collect, model and analyze Interior’s internal and external information (e.g., financial, constituent, demographic) across Interior for decision-making and accountability.

RTA-3) The IEA will enable access by interested parties, from multiple locations, via multiple methods and media, to appropriate information.

RTA-4) The IEA will enable an increase in the types and quantity of internal business metrics collected, monitored and analyzed for use by management.

RTA-5) The IEA will provide common application and data interoperability mechanisms to facilitate process interoperability and information exchange. Support will exist to exchange management and operational information within Interior and with outside entities.

RTA-6) The IEA will enable the ability to provide around-the-clock business operations and an Interior-wide systems management capability (e.g., event alert monitoring, performance analysis, capacity planning, etc.)

RTA-7) The IEA will enable the ability to support, capture, store, and display interested parties interactions and how they prefer to interact with Interior and its partners.

RTA-8) The IEA will provide employees with cost effective connectivity to the public Internet (e.g., news services, research, and customer collaboration), intranets (e.g., human resource, organizational news, training) and other specialized information providers (e.g., extranets.)

RTA-9) The IEA will provide a means to deliver interactive training (e.g., video teleconferencing, computer-based training, etc.) where the teachers and students are not co-located.

RTA-10) The IEA will provide support for major increases in productive (collaborative) teamwork including emails, file transfers, video/audio links, secure teleconferencing, work flow processes etc.

RTA-11) The IEA will provide secure access to all computing and information resources for employees (including mobile).

RTA-12) The IEA will provide unified directory services that integrate the existing identification, routing, connectivity, and access control functions of our computing environments (e.g., security, Domain Naming Services, e-mail, authentication, authorization).

RTA-13) The IEA will provide Interior-wide systems that support the creation, tracking, capture in a record keeping system, storage, publication, retrieval and disposition of documents, images and other information rich objects that are used within bureau processes or are exchanged with external organizations and constituents.

RTA-14) The IEA will provide comprehensive information technology security and privacy mechanisms as well as access rights management to ensure compliance with contractual, regulatory and other legal information requirements.

Example of How Requirements for Technical Architecture Evolve

As an example of how Requirements for Technical Architecture result from a logical process driven by business needs, the following illustration is offered:

- **Requirement for Technical Architecture #1 (RTA-1)** states "The IEA will support a shared data, information, and records infrastructure environment that provides flexible access to a consolidated data source. Data will be defined by standard definitions stored in a common repository and will be maintained by clearly identified data stewards." This specific RTA statement was derived from multiple business information requirements, such as
- **Business Information Requirement # 21 (BIR-21)** that states "Provide means of sharing information across organizational boundaries both internal (e.g., within and across bureaus) and external (e.g., suppliers and providers). The business information requirements were derived from multiple business drivers, such as
- **Business Driver # 9 (BD-9)** that states "Provide policy makers and senior managers with quality and essential information for decision-making." The business drivers were derived from business strategies, such as
- **Business Strategy # 15 (S-15)** that states "Improve data management systems." The business strategies are responses to environmental trends, such as
- **Environmental Trend # 13 (ET-13)** that states there is an "Increasing need for faster, more complete access to information by Interior personnel to improve service delivery, worker productivity, and management of public resources."

The above illustration is for the purpose of showing how trends and strategies that influence the business of Interior will ultimately guide the development of a technical architecture, known as the Interior Enterprise Architecture. Interior IT solutions will be the result of traceable linkages to business requirements, which will meet both Clinger-Cohen Act and OMB requirements placed upon Interior. Implementation of these solutions will enable a greater degree of interoperability and a reduction in duplicate data, computer systems and supporting technology.

Value of the Common Requirements Vision

The Common Requirements Vision is the foundation upon which subsequent components of the Interior Enterprise Architecture will be based. It is the touchstone. Each of the sections of the CRV (Environmental Trends, Business Strategies, Business Drivers, Business Information Requirements, and Requirements for Technical Architecture) will be used to support decisions on appropriate IT investments for Interior and provide verifiable linkages to business needs.

The Interior Enterprise Architecture is Interior's response not only to the Clinger-Cohen Act but also to the intensifying business need to deliver quality, cost-effective IT that enables Interior to effectively accomplish its mission. The Clinger-Cohen Act specifies the need for "an integrated framework for evolving or maintaining existing information technology and acquiring new information technology to achieve the agency's strategic goals and information resources management goals." The Interior Enterprise Architecture, and associated governance processes, will fulfill this requirement.

Business Drivers, Business Information Requirements, and Requirements for Technical Architecture were derived from business trends and strategies, and ***should be understood and used as logical recommendations but not as absolutes***. Management will always retain the control and responsibility for selecting appropriate technology solutions dependent upon priorities and resource availability. However, the IEA will be the primary foundation upon which IT decisions are made and justified -- both within Interior and to oversight organizations, such as OMB and GAO.

Contact for Further Information

Please contact the Office of the Chief Information Officer for more information about the Interior Enterprise Architecture. The OCIO can be reached at 202-208-6194.