



USGS Enterprise Architecture Plan

EA Tiger Team
4-26-02

U.S. Department of the Interior
U.S. Geological Survey

Team Members

- Donna Scholz - chair
- Jessica Alvarez - SA expertise and Water regional insights
- Paul Celluzzi - enterprise web and collaborative communications
- Stu Doescher - USGS representative on DOI Architecture Group and Geography insights
- Karen Kaye - architecture expertise and Biology insights – Now at DOI Architecture
- Mike McGreer - architecture expertise and capital investment concepts
- Ray Obuch - database expertise and Geology insights
- Sandy Williamson - publications expertise and Water ITAC insights

Enterprise Architecture Defined

The enterprise architecture (EA) establishes the USGS-wide roadmap to achieve the USGS mission through optimal performance of its core scientific and administrative processes within an efficient information technology (IT) environment.

Enterprise Architectures

- Are “blueprints” for systematically and completely defining an organization’s current (baseline) or desired (target) environment.
- Are essential for evolving information systems and developing new systems that optimize their mission value.
- Assist in optimizing the interdependencies and interrelationships among an organization’s scientific and administrative processes and the underlying IT support operations.

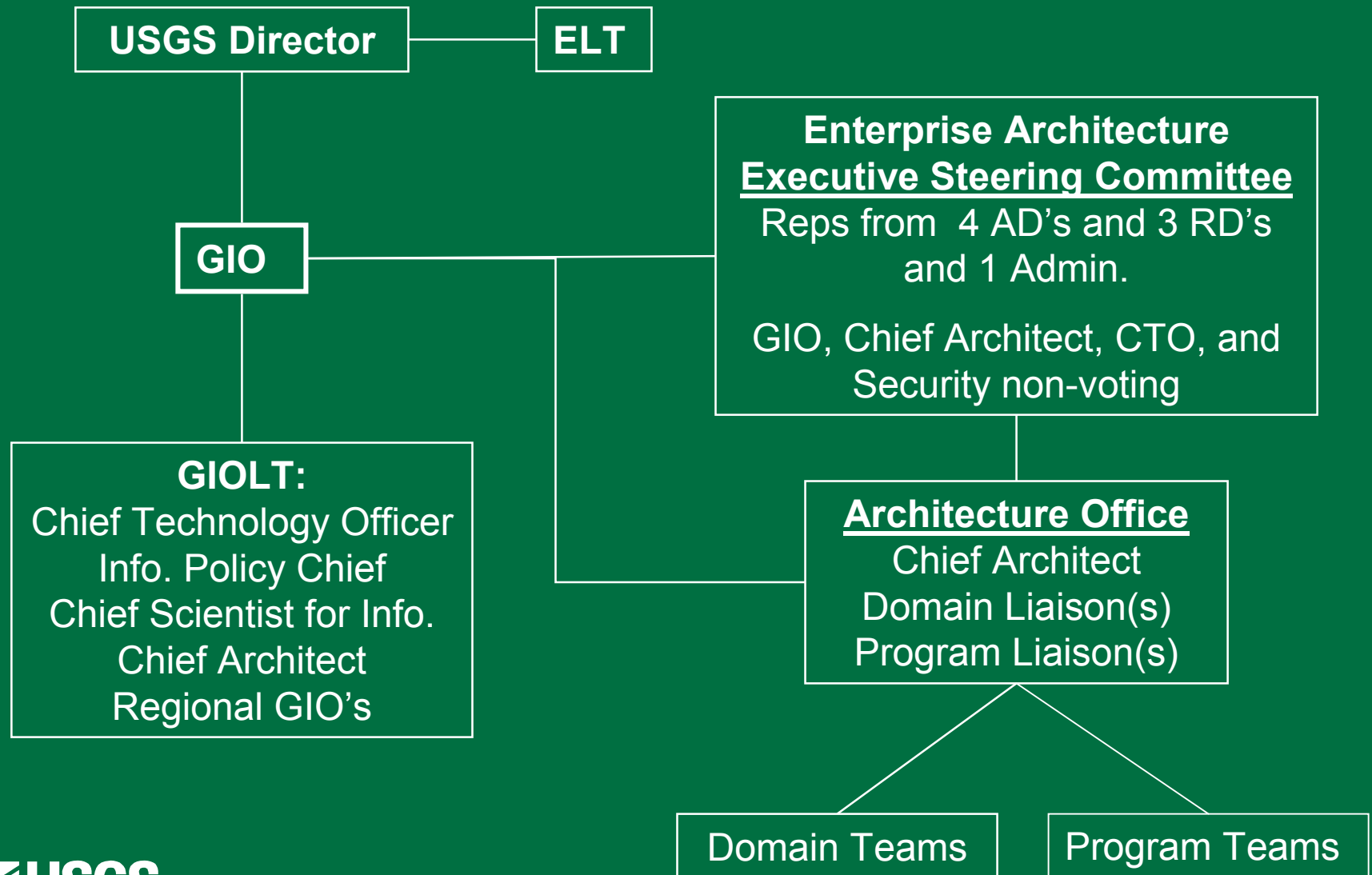
Zachman Architecture Framework

	What	How	Where	Who	When	Why
Planners						
Owners						
Designer						
Builder						
Vendor						
Product						

Deliverables

- **Tiger Team Report with Appendices:**
 - Enterprise Architecture Executive Steering Committee Charter
 - Enterprise Architecture Office Charter
 - Draft Guidance and Principles
 - Suggested sequence of steps
- **PowerPoint Briefing(s) for GLOLT**
- **Quick Place repository of references**

Architecture Organization Chart



Enterprise Architecture Executive Steering Committee

- Ensures the EA is in alignment with scientific and administrative functions
- Approves the EA and updates
- Establishes and controls the process and approval thresholds to ensure compliance with EA
- Approves the Architecture office plans

Enterprise Architecture Executive Steering Committee

- Chair is a scientist appointed by the GIO, annually renewable
- Reps from 4 AD's and 3 RD's and 1 Admin.
 - 10-15% FTE each
- GIO, Chief Architect, CTO, and IT Security Chief – all non-voting
- Meets at least quarterly

Enterprise Architecture Office

- Establishes a common framework for refining and defining scientific, administrative information requirements and aligning IT.
- Works closely with the GIOLT, the Enterprise Architecture Executive Steering Committee, bureau strategy, planning, programming and budgeting groups, and discipline offices to accomplish EA.

Enterprise Architecture Office

- Promotes the use of architecture process in scientific and administrative planning, and IT operations.
- Facilitates, coordinates and mentors the program teams and the domain teams.
- Develops annual and long-term architecture office plans and budgets.
- Coordinates Bureau architecture and planning with the Department and other government architecture activities.
- Ensures compliance of significant IT expenditures and program architecture plans with the Bureau EA.

Enterprise Architecture Office

Chief Architect	Heads the Enterprise Architecture Program Management Office, organizes and manages the Enterprise Architecture office; directs development of the baseline and target architecture.
Program Liaison (2)	Coordinate, communicate and facilitate the Bureau scientific and administrative views (rows 1 and 2 of Zachman) and strategic planning teams
Domain Liaison (2)	Coordinate, communicate and facilitate the Bureau current and future technology teams (domains), (rows 3-5 of Zachman). Coordinates with the DoI domain teams.

Functions below need support

Analysis and Modeling	Analyzes and documents scientific and administrative processes, scenarios, and information flow.
Technical Documentation	Ensures that policies, guidebooks, and other documentation within the Enterprise Architecture repository are clear, concise, usable, and conform to configuration management standards.
Quality Assurance	Ensures that all established program and project standards, processes, and practices are met.
Risk Management	Identifies, monitors, and controls risks in light of environmental factors and constraints.
Configuration Control	Assures that all changes are identified, tracked, monitored, and appropriately documented.

Suggested sequence of steps

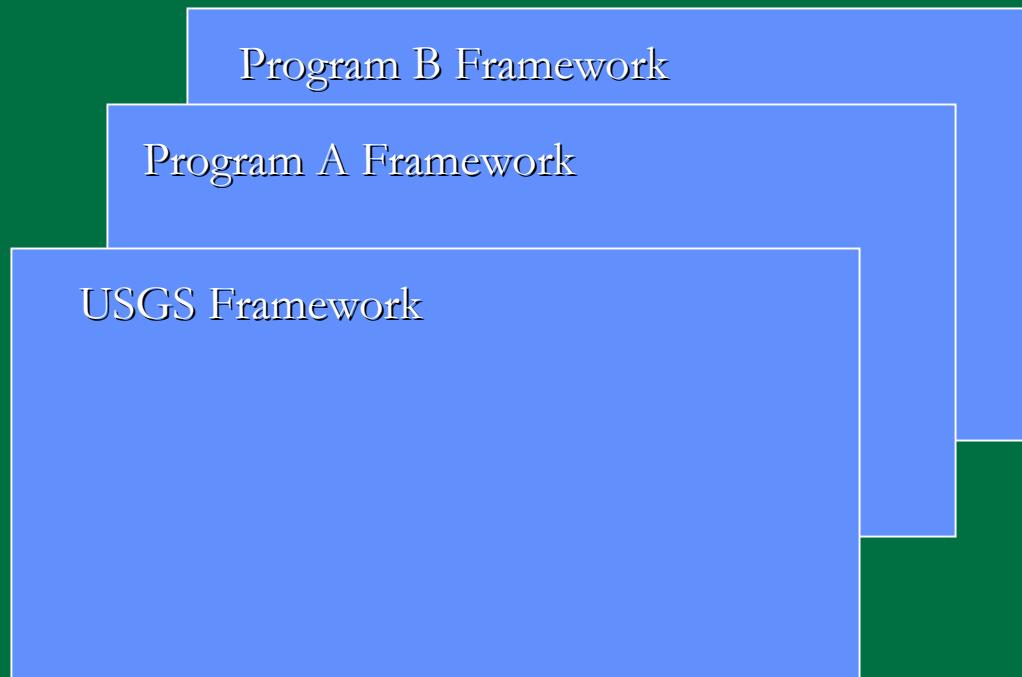
1. Develop Statement Of Work For Contractor – to be awarded 5-3-02
2. EA Tiger Team Report Adopted
3. Select Chief Architect
4. Select Architecture office staff
5. Select EA Steering Committee
6. Architecture office develop EA Plan for steering committee approval

Outline for Statement of Work for Initial Architecture contract

- **Develop an Architecture and Communications Plan**
- **Develop initial framework for USGS Architecture, tools and repository**
- **Develop sub architecture for The National Map**
- **Refine mechanism for additional sub architectures**
- **Existing Tiger Team will act on behalf of Architecture Office until it is formed**

The end

Conceptual Architecture Framework



Outline for Statement of Work for Architecture contract

- **Work closely with the architecture core team and steering committee, and program team**
 - Focus on “program-architecture” (Federated Model)
 - Focus on Zachman rows 1 & 2 for “USGS Architecture”
 - Training/Mentoring USGS architecture workers and program leaders (steering committee)
 - Help develop communications plan:
 - Help prepare ‘road show’, website, newsletter?
 - Assist in tool evaluation for the repository

Year One Contractor Cost Estimate

Level of Effort	# Program Efforts	Baseline Contract Hours	Cost per hour	Total Hrs	Est. Cost
Enterprise Plan Plus scope and business view	1	1,280	120	1,280	153,600
Minimum Level: (Capital Investment Plans)	21	80	120	1,680	201,600
Complete Program Architectures	4	640	120	2,560	307,200
Annual Level of Effort					662,400

Contracting Guidelines

- Time and materials basis
- Work alongside USGS employees
- Experience base of architecture in the federal gov [3-5 yrs]
- Experience in business modeling
- Hire the person(s) not the organization
- 'Lease before you buy'

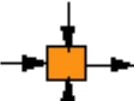
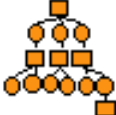
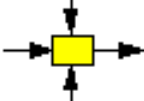
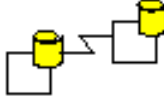
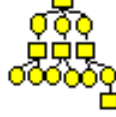
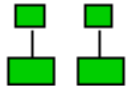
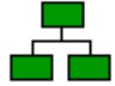
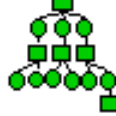
Domain Liaison Options

- **Option A:** Two FTEs selected to facilitate technical requirements with DoI Domains and the Technical Reference Model. These individuals will also work with the CTO to identify the Bureau IT teams and the development of the Bureau domains.
- **Option B:** The CTO assigns two FTE's to facilitate technical requirements with DoI Domains and the Technical Reference Model. These individuals will also work with the CTO to identify the Bureau IT teams and the development of the Bureau domains.

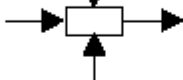
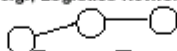
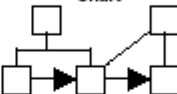
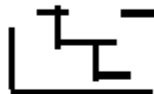
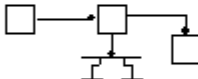
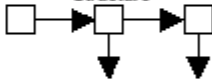
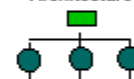
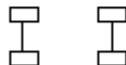
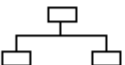
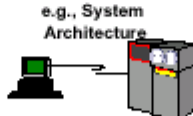
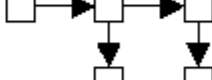
Zachman Framework

	What	How	Where	Who	When	Why
Planners	Scope Objects: List of Things	List of Science and Administrative Processes	List of Locations	List of Organization and Enterprise Parties	List of Science and Administrative Events	List of Mission, Vision, Goals, and Strategies
Owners	Science and Administrative Concepts and Relationships	Science and Administrative Process Models	Logistics	Organization Structure/Charts	Schedule of Events and Activities	Science and Administrative Plan: Goals, Objectives etc.
Designer	Science and Administrative Data Models	Application Architecture	Distributed System Architecture	Role Assignments and Team Models	Process Structure	Science and Administrative Model Strategies
Builder	Logical and Physical Data Models	System Design	Technology Specifications	Team and Responsibility Models	Control Structure / Event Models	Requirements Model
Vendor	Component Content Description	3 rd Party Component	Industry Standards, HW/SW Services	Outsourcing Services / Suppliers	Timing	Industry Best Practices
Product	Data Stores	Integrated Component Executables Published	Distributed Computing Services	Security: Role Access - Organization	Job and Event Schedules	Publishes Science And Administrative Plan

ENTERPRISE ARCHITECTURE - A FRAMEWORK™

	DATA <i>What</i>	FUNCTION <i>How</i>	NETWORK <i>Where</i>	PEOPLE <i>Who</i>	TIME <i>When</i>	MOTIVATION <i>Why</i>	
SCOPE (CONTEXTUAL)	List of Things Important to the Business 	List of Processes the Business Performs 	List of Locations in which the Business Operates 	List of Organizations Important to the Business 	List of Events Significant to the Business 	List of Business Goals/Strat 	SCOPE (CONTEXTUAL)
<i>Owner</i>	Entity = Class of Business Thing	Function = Class of Business Process	Node = Major Business Location	People = Major Organizations	Time = Major Business Event	Ends/Mean = Major Bus. Goal/Critical Success Factor	<i>Owner</i>
ENTERPRISE MODEL (CONCEPTUAL)	e.g. Semantic Model 	e.g. Business Process Model 	e.g. Business Logistics System 	e.g. Work Flow Model 	e.g. Master Schedule 	e.g. Business Plan 	ENTERPRISE MODEL (CONCEPTUAL)
<i>Owner</i>	End = Business Entity Rein = Business Relationship	Proc = Business Process FO = Business Resources	Node = Business Location Link = Business Linkage	People = Organization Unit Work = Work Product	Time = Business Event Cycle = Business Cycle	End = Business Objective Means = Business Strategy	<i>Owner</i>
SYSTEM MODEL (LOGICAL)	e.g. Logical Data Model 	e.g. Application Architecture 	e.g. Distributed System Architecture 	e.g. Human Interface Architecture 	e.g. Processing Structure 	e.g. Business Rule Model 	SYSTEM MODEL (LOGICAL)
<i>Designer</i>	End = Data Entity Rein = Data Relationship	Proc = Application Function FO = User Views	Node = VS Function (Processor, Storage, etc) Link = Line Characteristics	People = Role Work = Deliverable	Time = System Event Cycle = Processing Cycle	End = Structural Assertion Means = Action Assertion	<i>Designer</i>
TECHNOLOGY MODEL (PHYSICAL)	e.g. Physical Data Model 	e.g. System Design 	e.g. Technology Architecture 	e.g. Presentation Architecture 	e.g. Control Structure 	e.g. Rule Design 	TECHNOLOGY MODEL (PHYSICAL)
<i>Builder</i>	End = Segment/Table/etc. Rein = Pointer/Key/etc.	Proc = Computer Function FO = Data Element/Set	Node = Hardware/System Software Link = Line Specifications	People = User Work = Screen Format	Time = Execute Cycle = Component Cycle	End = Condition Means = Action	<i>Builder</i>
DETAILED REPRESENTATIONS (OUT-OF-CONTEXT)	e.g. Data Definition 	e.g. Program 	e.g. Network Architecture 	e.g. Security Architecture 	e.g. Timing Definition 	e.g. Rule Specification 	DETAILED REPRESENTATIONS (OUT-OF-CONTEXT)
<i>Sub-Contractor</i>	End = Field Rein = Address	Proc = Language Stmt FO = Control Block	Node = Addresses Link = Protocols	People = Identity Work = Job	Time = Interrupt Cycle = Machine Cycle	End = Sub-condition Means = Step	<i>Sub-Contractor</i>
FUNCTIONING ENTERPRISE	e.g. DATA	e.g. FUNCTION	e.g. NETWORK	e.g. ORGANIZATION	e.g. SCHEDULE	e.g. STRATEGY	FUNCTIONING ENTERPRISE

Zachman's Framework for Information Systems Architecture

	What	How	Where	Who	When	Why
	Data	Function	Network	People	Time	Motivation
DEFINITION	Scope List of Things Important to Business 	List of Processes the Business Performs 	List of Locations Important to Business 	List of Organizations Important to Business 	List of Events Significant to Business 	List of Business Goals/Strategies 
	Investor Entity=Class of Business Thing 	Function=Class of Business Process 	Node=Major Business Location 	Agent=Major Org Unit 	Time=Major Business Event 	End/Mean=Major Business Goal/CSF
DESIGN	Enterprise Model e.g., Entity Relationship Diagram 	e.g., Function Flow Diagram 	e.g., Logistics Network 	e.g., Organization Chart 	e.g., Master Schedule 	e.g., Business Plan 
	Owner Ent=Business Entity Rel=Business Rule 	Function=Business Process 	Node=Business Location Link=Business Linkage 	Agent=Org Unit Work=Work Product 	Time=Business Event Cycle=Business Cycle 	End=Business Objectives Means=Business Strategy
DEVELOPMENT	Information System Model e.g., Data Model 	e.g., Data Flow Diagram 	e.g., Distributed System Architecture 	e.g., Human Interface Architecture 	e.g., Processing Structure 	e.g., Knowledge Architecture 
	Designer Entity=Data Entity Relationship=Data Relationship 	Func=Appl Function Arg=User Views 	Node=Info Sys Funct Link=Line Char 	Agent=Role Work=Deliverable 	Time=System Event Cycle=Processing Cycle 	End=Criterion Means=Option
	Technology Model e.g., Data Design 	e.g., Structure Chart 	e.g., System Architecture 	e.g., Human/Technology Interface 	e.g., Control Structure 	e.g., Knowledge Design 
	Builder Entity=Segment/Row Relationship=Pointer/Key 	Func=Computer Funct Arg=Screen/Device Formats 	Node=Hardware/System Software Link=Line Specification 	Agent=User Work=Job 	Time=Execute Cycle=Component Cycle 	End=Condition Means=Action
FUNCTIONING SYSTEM	Components e.g., Data Definition Description 	e.g., Program 	e.g., Network Architecture 	e.g., Security Architecture 	e.g., Timing Definition 	e.g., Knowledge Definition 
	Subcontractor Ent=Fields Rel=Addresses 	Func=Language Stmts Arg=Control Blocks 	Node=Addresses Link=Protocols 	Agent=Identity Work=Transaction 	Time=Interrupt Cycle=Machine Cycle 	End=Subcondition Means=Step
	e.g., Information	e.g., Application	e.g., Technology	e.g., Organization	e.g., Schedule	e.g., Strategy