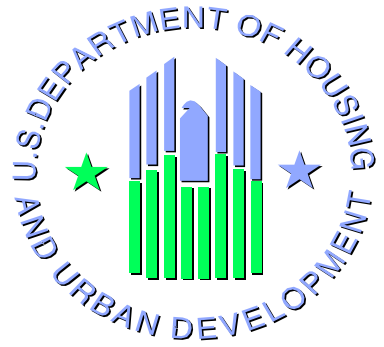


Segment Architecture Development Guidance/Work Product and Decision Templates

Volume 1 of 1

January 2007

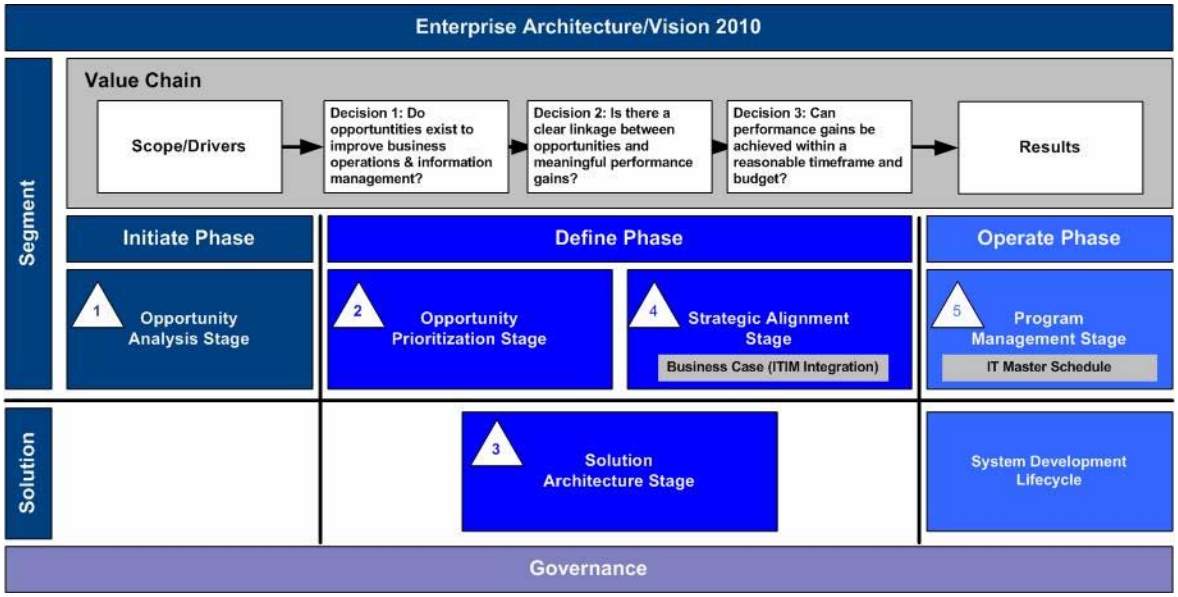
Revision History

Date	Version	Summary
9/06	Version 0.A	Initial draft version of segment architecture development guidance and work product/decision templates. This version will be verified through collaboration with Integrated Program Teams (IPTs) and development of segment architecture work products for core mission areas, business services and enterprise services.
1/07	Version 1.0	Incorporated comments received on draft.

Synopsis

Segment Architecture Development Guidance provides instructions and work product templates to develop segment architecture, and enhance decision-making during the definition and execution of business and information technology (IT) modernization initiatives. Segment architecture creates a bridge between the Department of Housing and Urban Development's (HUD's) strategic goals and objectives and tactical IT implementation, and increases the detail and utility of enterprise architecture (EA) to achieve measurable performance improvements.

Segment architecture is developed in three phases – *initiate, define and operate.* Each phase is aligned with a simple value chain process and comprises one or more stages. The following graphic provides an overview of the segment architecture development process and the relationships between each element of the development process.



Work products created during each phase of the segment architecture development process are driven by information requirements to fulfill each element of the value chain and to enhance decision-making. In addition, products are developed to achieve a maximum level of reuse by other life cycle processes including enterprise architecture, IT investment management (ITIM), program/project management, and the system development life cycle (SDLC).

Segment architecture development is executed by an Integrated Program Team (IPT) comprising business and technical subject matter experts. The guidance included in this document, provides IPTs with clear directions and templates for the creation of results-oriented deliverables in the following practice areas:

- Requirements Definition (Architectural Drivers)
- Opportunities Analysis
- Baseline Architecture Development
- Total Cost of Ownership (TCO) Analysis
- Target Architecture Development
- Implementation Planning
- Program/Project Management

Demonstrated level of EA Practice maturity

This document demonstrates the following level of EA practice maturity relative to the current version of the OMB EA assessment framework.

COMPLETION			
Assessment Criteria	**Level(s)**	**Section/Reference**	**Summary Rationale**
Federation of Segment Architecture	3	5.2.3/Use	Standard EA framework and modeling standards.

Presidential Management Agenda (PMA) Milestones

This document fulfills the following quarterly Presidential Management Agenda (PMA) milestones:

Milestone	Due Date	Completion Date	Status
Complete standard segment architecture work product templates and decision templates	9/30/06	9/30/06	Complete: Initial version of segment architecture guidance and work product/decision templates.

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1 Segment Architecture Overview

1.1 Introduction

Segment architecture is business-driven, results-oriented architecture for a segment or portion of the enterprise. Segment architecture development is a scalable and repeatable process performed by HUD's program and support offices with assistance from the Office of the Chief Information Officer Staff (OCIO). The process enhances the efficiency and effectiveness of business and IT modernization initiatives. This collaborative process is a critical element of HUD's three-phase IT life cycle framework – architect, invest and implement – providing a bridge between HUD's strategic vision for business and IT modernization (Vision 2010) and tactical IT implementation.

Segments are identified and prioritized by HUD's enterprise architecture and EA transition strategy, and are organized into three categories:

- **Core Mission Areas**: Unique service areas that define the mission or purpose of the agency. Core mission areas are defined by the agency BRM (e.g. Community and Economic Development, Rental Housing Assistance, Multi-Family Housing Finance).
- **Business Services**: Common or shared business functionality that support the core mission areas. Business services are defined by the agency Business Reference Model (BRM) and include the foundational mechanisms and back office services used to achieve the purpose of the agency (e.g., loan insurance, grants management, financial management).
- **Enterprise Services**: Common or shared IT services that support core mission areas and business services. Enterprise services are defined by the agency Service Component Reference Model (SRM) and include the applications and service components used to achieve the purpose of the agency (e.g. knowledge management, records management, mapping/GIS, business intelligence, and reporting).

The EA transition strategy provides a simple roadmap documenting the relationships and dependencies between individual segments in each category. The Chief Architect coordinates implementation of the transition strategy and segment integration to increase enterprise-wide collaboration and reuse.

Figure 1-1 shows the relationships between the three categories of segments.

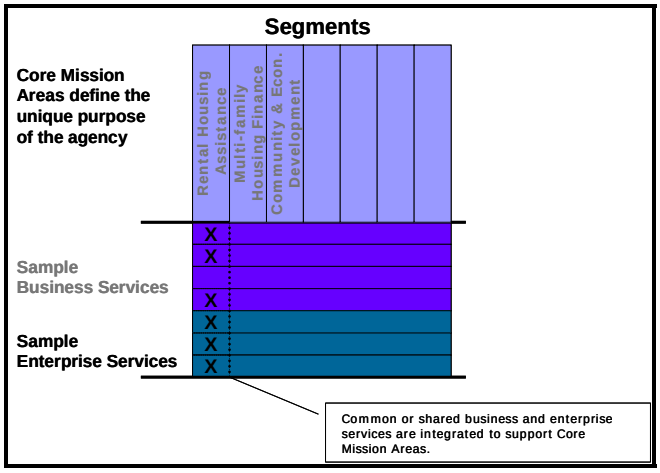


Figure 1-1: Segment Relationships

1.1.1 Segment Architecture Principles

Segment architecture development seeks to provide the right information at the right time to support business and IT modernization initiatives and the implementation of associated business and information management solutions. To achieve this objective, segment architecture content and the segment architecture development process reflect the following guiding principles:

Principle #1: Segment architecture development is conducted on the basis of "just enough, just in time" to support business and information management decisions.

Rationale: Segment architecture development is a *business-driven*, *results-oriented* practice executed to provide information at the right level of detail to support informed decision-making for both long-term planning and near-term implementation and execution. Architecture development is an iterative process providing increasing levels of work product detail to fulfill business and information management requirements and achieve performance improvements.

Principle #2: Segment architecture development and approval precedes IT investment planning and program and project execution.

Rationale: IT investment decisions and implementation decisions are supported by approved architectural work products. Segment-level work products are reconciled with HUD's enterprise vision and are applied to support the development of business cases for IT investment, and the preparation of program-level and project level management plans to support solution development. Segment architecture development is coordinated with IT investment management and program management to improve decision-making.

1.1.2 Segment Architecture Process

Segment architecture development provides a powerful technique for OCIO staff members and EA program staff members to collaborate with business stakeholders to implement the agency enterprise architecture and deliver value to program offices and support offices. The segment architecture development process is a methodology structured around asking and answering questions about stakeholder requirements. The methodology is used to make informed decisions about the nature and priority of identified opportunities. The information derived throughout the process is used to plan and initiate business and information management solutions that will assist in the achievement of target performance goals.

The segment architecture development process connects architectural work products at three levels – *enterprise, segment, and solution*:

- **Enterprise architecture:** describes the agency-level vision for business and information management and performance improvement. Major elements of EA include baseline and target architecture and a transition plan or roadmap for business and IT modernization (Vision 2010).
- **Segment architecture:** provides baseline and target architecture and a detailed transition strategy for a portion of the enterprise. Segments are defined by the agency EA, and segment architecture work products are reconciled at the enterprise level to increase collaboration and reuse.
- **Solution architecture:** is developed for priority opportunities to achieve target performance improvements. Solution architecture work products are reconciled to develop and maintain the segment architecture. They are also used/reused during the implementation of the HUD System Development Methodology (SDM).

Table 1-1 summarizes the characteristics of enterprise architecture, segment architecture, and solution architecture and illustrates the relationships between each architectural level:

Table 1-1: Architecture Levels

Level	Scope	Detail	Outcomes	Audience
Enterprise Architecture	HUD (Agency)	Lowest	Strategic	All Stakeholders
Segment Architecture	Core Mission Areas Business Services Enterprise Services	Medium	Business	Business Owners
Solution Architecture	Performance Improvement Opportunities	Highest	Operational	End User Project Managers Developers

Segment architecture links HUD's enterprise architecture (strategic vision for business and IT modernization) and the development and implementation of business and information solutions to achieve performance improvements. The segment architecture development process applies a simple value-chain to define the segment scope and change drivers (business needs), and to answer three simple questions to support decision-making and achieve results. Figure 1-2 provides an overview of the segment architecture value chain, architecture levels, phases and stages. It illustrates the value chain and the relationships between individual elements in the chain and the three phases in the segment development process – *initiate, define and operate*. It also shows how each of the five stages is associated to the phases and architecture levels.

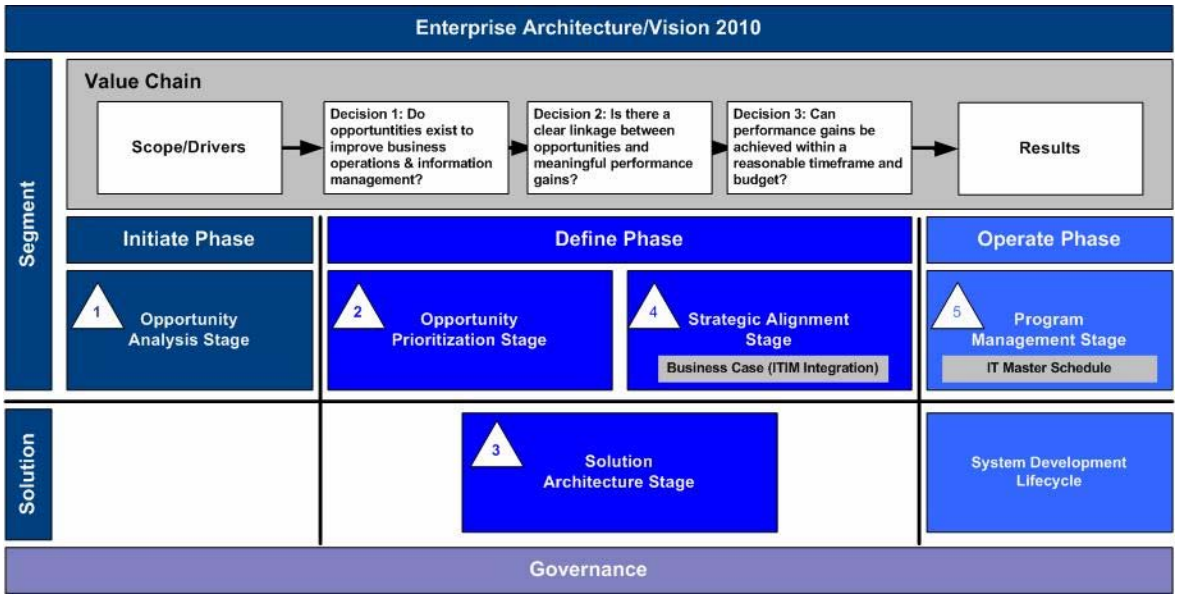


Figure 1-2: Segment Architecture Development Process

Each phase of the segment architecture development process comprises one or more stages and is designed to create a series of work products to achieve specific outcomes. All stages except the Solution Architecture stage are executed at the segment level. Solution Architecture stage is

executed at the solution level. Table 1-2 summarizes each stage and shows its relationship to each phase of the segment architecture development process.

Table 1-2: Segment Architecture Development Process

Phase	Stage	Summary Description
Initiate	1. Opportunity Analysis	Defines the segment scope and architectural change drivers (business needs). Applies change drivers to define a list of potential opportunities to improve business and information management.
Define	2. Opportunity Prioritization	Applies evaluation criteria to prioritize and select specific opportunities to improve business and information management and generate results.
	3. Solution Architecture	Develops detailed architecture for priority opportunities. Architecture is developed to a sufficient level of detail (breadth and depth) to achieve target performance improvements.
	4. Strategic Alignment	Verifies that opportunities can be achieved in a reasonable timeframe, with available resources, and in compliance with the enterprise vision. Brings together solution architecture to define a single segment-level architecture and transition strategy (implementation plan).
Operate	5. Program Management	Defines an executable program management plan, comprising multiple individual projects, to achieve performance improvement goals.

Segment architecture development is conducted by an Integrated Program Team (IPT) comprising business subject matter experts, EA program staff members, and technical subject matter experts. IPT activities and meetings are coordinated and managed by an assigned Program Manager. The Program Manager is responsible for executing the segment architecture development process and coordinating interactions with other IT life cycle processes. Members of the EA program staff participate as members of an IPT to aid in the development of segment architecture, and assist Program Managers by resolving questions about the segment architecture development process and individual steps and work products.

1.1.3 Segment Architecture Content

Segment architecture comprises a series of work products describing baseline ("as-is") architecture, target ("to-be") architecture, and a transition strategy for a core mission area, business service or enterprise service. These work products are developed throughout the segment architecture development process. They capture segment-level change drivers; describe segment-level baseline and target performance, business, data, services and technology architecture; and provide an implementation plan to enhance business operations and achieve measurable performance improvements. In accordance with principle #1, architecture work products are developed to a sufficient level of detail ("just enough, just in time") to enhance decision-making during each phase of the IT life cycle framework.

Segment architecture work products are developed using standard work product templates. Individual templates are designed to collect or develop information to answer specific questions. The templates are defined and developed to maximize reuse and support life cycle processes including enterprise architecture, IT investment management, and program/project management and execution.

1.2 About This Guidance

This guide provides step-by-step instructions for Program Managers and IPT members to execute the segment architecture development process and develop segment architecture work products.

Following this introduction, ***Section 2*** provides a detailed description of the segment architecture development process including decision points and process interfaces.

Section 3 describes the purpose, content and format of each segment architecture work product. This section provides instructions on how to develop each work product, and sample products illustrate segment architecture content and format.

1.3 Measuring Progress

The segment architecture development process provides a simple framework to measure progress towards the implementation of HUD's enterprise architecture and EA transition strategy. Progress through each phase and stage of the segment architecture development process is tracked by EA program staff using the segment architecture development dashboard (Figure 1-3). The dashboard is updated at the end of each stage and is used to provide actual progress measures (i.e. number of segments that have completed the initiate phase [opportunities analysis], number of segments that have completed the define phase). It helps to track the completion of detailed architecture on a segment-by-segment basis, and track the use of segment architecture to support IT investment management and program/project execution to deliver value to business areas and support offices.

Segment Types	Versions	**Resources**	Integrated Program Team	**Progress**	Initiate (Opp. Analysis)	Define (Opp. Prioritization)	Define (Solution Architecture)	Define (Strategic Alignment)	Operate (Program Management)	**Architecture (Completion)**	Performance Architecture	Business Architecture	Data Architecture	Service Architecture	Technical Architecture	Transition Strategy	**Federal Transition Framework**	Cross Agency Initiative	**Governance (EA)**	EA Review/Approve	**Lifecycle Integration**	Investment: Business Case	Results: IT Master Schedule		Notes
Core Mission Areas																									
Multi-family Housing Finance	1		●		●	●	⊙	●	●		●	●		●	●	●				●		●	●		Segment update Q2/Q3 2007
Rental Housing Assistance	2		●		●	●	⊙	●	●		●	●		●	●	●				●		●	●		
Single Family Housing	2		●		●	●	⊙	●	●		●	●	⊙	●	●	●				●		●	●		Q1/2007 Data Architecture (LOM Module)
…																									
Business Services																									
Financial Management	1		●		●	●	●	●	●		●	●	●	●	⊙	●		●		●		●	●		SSC select/implement FY2007
Grants Management	3		●		●	●	⊙	⊙	●		●	●	⊙			⊙		●				●	●		Strategic Alignment Q3/2007
Human Resources Mgmt	1		●		●		●	●	●		●	●		●	●	●		●		●		●	●		
…																									
Enterprise Services																									
EDRM	1		●		●	●	⊙	●	●		●	⊙	⊙	⊙	⊙	⊙						●	●		<insert date for next version?>
Identity Management																									In progress
Portal																									In progress
Tracking and Workflow	1						⊙	●																	
…																									

⊙ Partial ● Complete

Figure 1-3: Segment Dashboard (illustrative)

1.4 Continuing Process Development: Next Steps

The following activities will be executed as "next steps" to enhance the effectiveness of the segment architecture development guidance, and work product and decision templates:

- Verify each phase and stage of the segment architecture development process and each work product template during the development of segment architecture

for core mission areas, business services, and enterprise services. EA program members work with the Program Manager and IPT members to capture lessons learned during the execution of the segment architecture development process. Lessons learned will be captured and applied to improve the development process and work product templates to ensure segment architecture development supports each element of the value chain, and enhances the definition and execution of business and IT modernization initiatives.

- Update EA governance and management processes to ensure segment architecture development is fully integrated with HUD's IT life cycle processes. Governance processes will be updated to increase enterprise-wide collaboration and reuse through the definition and implementation of governance touch points across each phase of the IT life cycle framework (e.g. segment architecture review and reconciliation, EA development and maintenance, service discovery and reuse, and technology insertion).

2 The Segment Architecture Development Process

This section provides a detailed description of the segment architecture development process. It includes guidance organized using the five stages of the segment architecture development process illustrated in Figure 2-1.

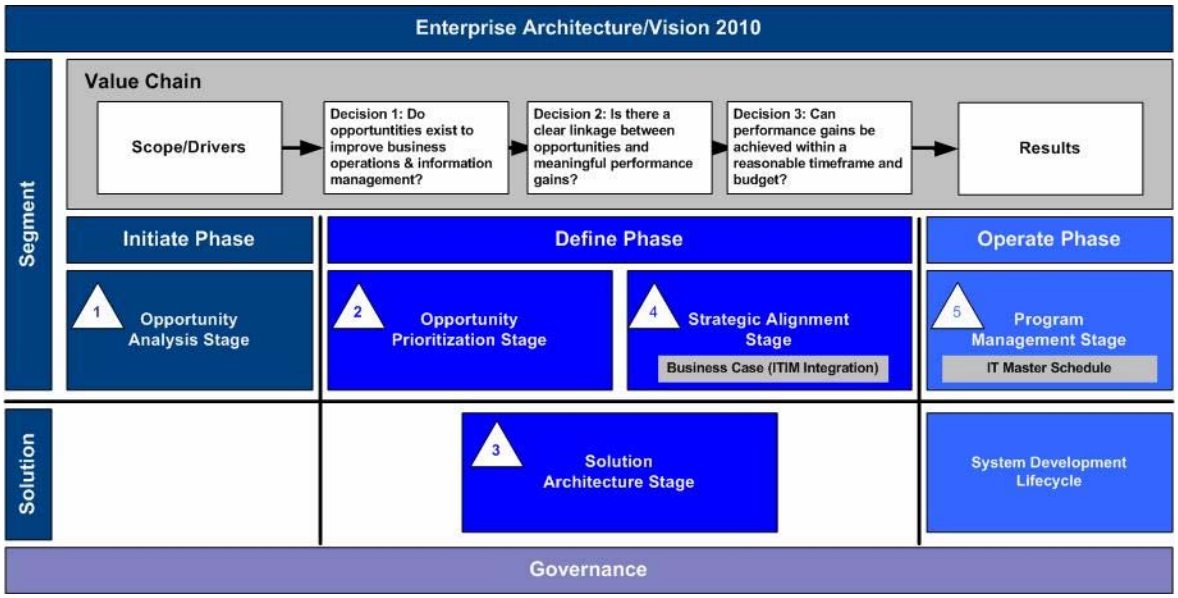


Figure 2-1: Segment Architecture Development Process

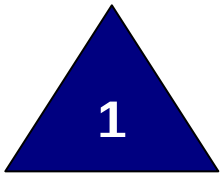
A triangle shaped symbol with the number associated to the appropriate stage (Figure 2-2) marks the beginning of the guidance for each stage. The symbol is used to orient users and establish a link between the written guidance and the summary diagram (Figure 2-1).

Figure 2-2: Segment Architecture Development Stage Symbols

Each stage of the segment architecture development process includes the following elements:

- Stage number and name
- Overview
- Target outcomes
- Estimated level of effort (elapsed time)
- Process description
- Work product template references

The process description includes step-by-step guidance comprised of the individual activities for each stage. It includes the stage inputs, outputs, and opportunities for reuse. In addition, references are provided to work product templates that are to be used for each stage. Details associated to the work products are described in *Section 3*.



Opportunity Analysis

Review the segment scope captured in the EA and apply the business and information management needs (drivers) to identify potential opportunities for improvement.

The Opportunity Analysis stage starts the segment architecture development process. The Program Manager is assigned and IPT members are identified. Role(s) are clearly defined for each member. During this stage, baseline information and business needs are complied and reviewed to identify a list of potential opportunities.

The target outcomes of the Opportunity Analysis stage are:

- A Program Manager
- An IPT with clearly defined roles
- A list of potential opportunities to improve performance
- Evaluation criteria which will be used to prioritize potential opportunities and help determine their relative value.

Note: The determination that no viable opportunities to improve performance exist, is an acceptable outcome of the Opportunities Analysis stage.

The estimated level of effort (elapsed time) to complete the Opportunity Analysis Stage is 10 days.

Process Description

Table 2-1outlines each step in the Opportunity Analysis stage including inputs and outputs. References are provided to the work product templates in Section 3. The reuse column identifies potential opportunities to reuse work products developed by each step.

Table 2-1: Opportunity Analysis Stage

Step	Input	Output	Reuse
Assign Program Manager as IPT Lead		Program Manager assignment	
Establish IPT		IPT Roles Matrix and Roster (Template 1) IPT member notifications	
Create Segment Initialization package	Enterprise Architecture Enterprise Architecture Transition Plan IT Portfolio	Segment Initiation Package (Template 2)	Communications and Outreach

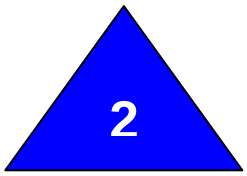
Step	Input	Output	Reuse
Execute Facilitated Session	Segment Initiation Package Segment architecture decision templates and process	Potential Opportunities List (Template 3) Opportunity Prioritization Criteria (Template 4) Working Session Minutes (Template 5)	Communications and Outreach
Develop Work Plan and Update Segment Architecture Dashboard	Potential Opportunities List Working Session Minutes	Work Plan (Microsoft Project) (Template 6) Segment Architecture Dashboard updated	

Referenced Work Product Templates

Table 2-2 provides the reference number for each work product template referenced in the Opportunity Analysis stage (output column), and describes the specific questions supported by the completion of each work product. References are provided to work product templates in Section 3.

Table 2-2: Opportunity Analysis Stage Work Product Questions

Template #	Name	Question(s) Answered
1	IPT Roles Matrix and Roster	What skill sets are required to address segment architecture needs? Are those personnel available for IPT assignment? Do they understand their roles?
2	Segment Initiation Package	What is the segment scope and what are the drivers for business and IT modernization? What is the baseline operating environment?
3	Potential Opportunities List	What are the potential business and IT modernization opportunities in this segment?
4	Opportunity Prioritization Criteria	What criteria are used to prioritize potential business and IT opportunities?
5	Working Session Minutes	What are the critical outcomes, decisions and actions from the facilitated session?
6	Work Plan	What are the critical steps and milestones to develop the segment architecture?



Opportunity Prioritization

Review candidate opportunities and apply evaluation criteria to prioritize and select opportunities for improvement.

Opportunity Prioritization, the first stage in the *Define* phase, is executed at the segment level. This stage identifies and closes baseline information gaps and estimates total cost of ownership (TCO) to provide information at a sufficient level to review and prioritize potential opportunities. Opportunity Prioritization selects opportunities to improve business and information management and achieve target performance improvements.

The target outcomes of the Opportunity Analysis are:

- Prioritize opportunities to improve business and information management
- Decide which opportunities will be pursued.

The estimated level of effort (elapsed time) to complete the Opportunity Prioritization stage is 15-20 days.

Process Description

Table 2-3 outlines each step in the Opportunity Prioritization stage including inputs and outputs. References are provided to the work product templates in Section 3. The reuse column identifies potential opportunities to reuse work products developed by each step.

Table 2-3: Opportunity Prioritization Stage

Process	Input	Output	Reuse
Review completeness of segment initiation package to support opportunity prioritization	Segment Initiation Package (Template 2) Potential Opportunities List (Template 3)	Baseline Information Gaps (Template 7)	
Assign IPT members responsibility to resolve information gaps		IPT member assignments	
Resolve Information Gaps	Segment Initiation Package (Template 2) Baseline Information Gaps (Template 7)	Update or augment Segment Initiation Package (Template 2)	
Develop Rough Order of Magnitude (ROM) Total Cost of Ownership (TCO)	Segment Initiation Package (Template 2)	Initial ROM TCO (Template 8)	

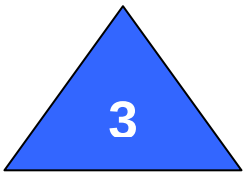
Process	Input	Output	Reuse
Conduct facilitated session to prioritize opportunities	Updated Segment Initiation Package (Template 2) Initial ROM TCO (Template 8)	List of prioritized opportunities (no template)	
Decision Point 1: Do opportunities exist to improve business operations and information management?	List of prioritized opportunities	Decision Paper #1 Opportunities Analysis Report (Part I) (Template 9)	
Determine which opportunities will be forwarded to the solution architecture stage	Opportunities Analysis Report (Part I) (Template 9)	Microsoft Project Plan (Template 6) Segment Architecture Dashboard updated	

Referenced Work Product Templates

Table 2-4 identifies the reference number for each work product template referenced in the Opportunity Prioritization stage (output column), and describes the specific questions supported by completion of each work product. References are provided to work product templates in Section 3.

Table 2-4: Opportunity Prioritization Stage Work Product Questions

Template #	Name	Question(s) Answered
7	Baseline Information Gaps	Are there gaps in the information to prioritize or disqualify potential opportunities? What additional information will help prioritize or disqualify segment opportunities?
2	Segment Initiation Package	What is the segment scope, and what are the drivers for business and IT modernization? What is the baseline operating environment?
8	Initial ROM TCO	What is the rough order of magnitude (ROM) estimate to operate the baseline environment?
9	Opportunities Analysis Report (Part I)	Which opportunities will be forwarded to the Solution Architecture stage?
10	Decision Paper 1	Do opportunities exist to improve business operations and information management?
6	Work Plan	What are the next steps and milestones to develop the segment architecture?



Solution Architecture

Develop solution-level architecture and conduct alternatives analysis and impact analysis for each opportunity selected to improve business and information management.

Solution Architecture, the second stage in the *Define* phase, is executed at the solution level. This stage defines a target vision to fulfill priority opportunities, and develops baseline (as-is) and target (to-be) architecture, implementation alternatives, and an implementation plan with preliminary resource estimates to meet business and information management requirements. Solution architecture is defined for each opportunity selected during the Opportunity Prioritization stage and determines whether improvement opportunities are linked to meaningful performance gains.

The target outcomes of the Solution Architecture stage are:

- Baseline and target architecture (for priority opportunities)
- Initial implementation plan and resource estimate
- Quantified performance improvements

The scope and level of detail of baseline and target architecture is based upon the individual opportunity and information requirements to validate target performance measures. The estimated level of effort (elapsed time) to complete the Solution Architecture stage is based upon the nature and complexity of each opportunity but should not exceed 45 days.

Process Description

Table 2-5 outlines each step in the Solution Architecture stage including inputs and outputs. References are provided to the work product templates in Section 3. The reuse column identifies potential opportunities to reuse work products developed by each step.

Table 2-5: Solution Architecture Stage

Process	Input	Output	Reuse
Define the scope	Microsoft Project Plan (Template 6) Opportunities Analysis Report (Part I) (Template 9)	Baseline CONOPS (Template 11)	
Define the vision	Microsoft Project Plan (Template 6) Opportunities Analysis Report (Part I) (Template 9)	Target CONOPS (Template 12)	

Process	Input	Output	Reuse
Develop the baseline architecture	Baseline CONOPS (Template 11)	**Baseline Architecture (Template 13):** Performance Business Data Services Technology Security Stakeholder	
Develop the target architecture	Target CONOPS (Template 12)	**Target Architecture (Template 13):** Performance Business Data Services Technology Security Stakeholder	
Analyze and develop baseline to Target Gaps	Baseline Architecture and Target Architecture (Template 13)	GAP Analysis Report (Template 14)	
Develop Implementation Alternatives	GAP Analysis Report (Template 14)	Alternatives and Impact Analysis Report (Template 15)	
Develop Solution Implementation Plan	Alternatives and Impact Analysis Report (Template 15)	Solution Implementation Plan and ROM TCO (Template 16)	
Decision Point 2: Is there a clear link between opportunities and meaningful performance gains?	Alternatives and Impact Analysis Report Solution Implementation Plan and ROM TCO (Template 16)	Decision Paper #2 (Template 17)	
Update Opportunities Analysis Report	Opportunities Analysis Report (Part I) (Template 9)	Opportunities Analysis Report (Part II) (Template 18)	

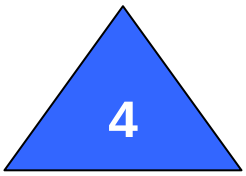
Process	Input	Output	Reuse
Update Work Plan and Update Segment Architecture Dashboard Capture Lessons Learned	Opportunities Analysis Report (Part II) (Template 18)	Microsoft Project Plan (Template 6) Segment Architecture Dashboard updated "Lessons-Learned" documentation	

Referenced Work Product Templates

The table below identifies the reference number for each work product template referenced in the Opportunity Prioritization stage (output column), and describes the specific questions supported by completion of each work product. References are provided to work product templates in Section 3.

Table 2-6: Solution Architecture Stage Work Product Questions

Template #	Name	Question(s) Answered
11	Baseline CONOPS	How do current functional and operational components work together to achieve business objectives?
12	Target CONOPS	What are the major functional characteristics of proposed business operations? How will proposed operations be executed to achieve business process improvements?
13	Baseline and Target Architecture	What is the right level of baseline and target information to identify and describe performance gaps?
14	Gap Analysis	Where are the current functional, technical, and performance gaps between baseline and target architecture?
15	Alternatives and Impact Analysis Report	What are the implementation alternatives to address the gaps between baseline and target architecture? What is the organizational impact of each alternative? What is the preferred alternative?
16	Solution Implementation Plan & ROM TCO	What are the proposed tasks, milestones and schedule for implementation? What is the expected total cost of ownership for the solution?
17	Decision Paper 2	Is there a clear linkage between opportunities and meaningful performance gains?
18	Opportunity Analysis Report (Part II)	What are the actual performance improvements to be generated by the solution architecture?
6	Work Plan	What are the next steps and milestones to develop the segment architecture?



Strategic Alignment

Verify that opportunities can be achieved in a reasonable timeframe with available resources and in compliance the enterprise vision.

Strategic Alignment, the third and final stage in the *Define* phase, is executed at the segment level. This stage brings together solution architecture (defined at the opportunity level) to create a single, segment-level architecture aligned with strategic goals and the enterprise vision. Segment architecture is applied to develop a reuse plan and implementation plan to increase enterprise-wide collaboration, apply economies of scale, and achieve target performance goals. The Strategic Alignment stage verifies that segment architecture is compliant with HUD's enterprise architecture and standards, and the implementation plan can be executed in reasonable time with available resources. At the completion of this stage, there is an interface point with the IT Investment Management (ITIM) Select process. The segment architecture is an input to the development of the IT investment business case. Using an approved segment architecture for the development of the IT investment business case enhances both the quality and strategic alignment of the business case.

The target outcomes of the Strategic Alignment stage are:

- Alignment with strategic goals
- Reuse strategy for business processes, data, applications, and technology
- Viable executable opportunities
- Verified segment-level architecture and implementation plan

The estimated level of effort (elapsed time) to complete the Strategic Alignment stage is 15-20 days.

Process Description

Table 2-7 outlines each step in the Strategic Alignment stage including inputs and outputs. References are provided to the work product templates in Section 3. The reuse column identifies potential opportunities to reuse work products developed by each step.

Table 2-7: Strategic Alignment Stage

Process	Input	Output	Reuse
Develop a conceptual segment architecture Summarize and reconcile individual opportunities describing segment-level integration and alignment including common services and relevant cross-agency initiatives (CAIs).	Opportunities Analysis Report (Template 18) Baseline Architecture and Target Architecture (Template 13) Solution Implementation Plan and ROM TCO (Template 16)	Conceptual Segment Architecture (Template 19) **Strategic Alignment Analysis (Template 20):** Strategic Goals/Objectives EA/EATP (Vision 2010) Cross-agency Initiatives	IT Investment Business Case

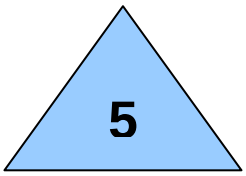
Process	Input	Output	Reuse
Develop Reuse Plan	Conceptual Segment Architecture (Template 19)	Reuse Plan (Template 21)	IT Investment Business Case
Conduct Workforce Capabilities Analysis	Conceptual Segment Architecture (Template 19)	Workforce Capability Analysis (Template 22)	IT Investment Business Case
Create Implementation Plan	Conceptual Segment Architecture (Template 19)	**Implementation Plan (Template 23):** Definition of projects Project sequencing and schedule Internal and external dependencies Link milestones to performance Measures Acquisition Strategy Risk Management Plan	IT Investment Business Case
Develop Funding Strategy/Spend Plan (including baseline and target contract map)	Conceptual Segment Architecture (Template 19) Implementation Plan (Template 23)	Funding Strategy and Spend Plan (Template 24)	IT Investment Business Case
Develop Segment Architecture Document	Segment Architecture Outline (Template 25)	Segment Architecture Document (Template 25)	IT Investment Business Case
Decision Point 3: Can performance gains be achieved in a reasonable time frame with available resources and budget?	Segment Architecture Document (Template 25)	Decision Paper #3 (Template 26)	
Review Segment Architecture	Decision Paper #3 (Template 26) Segment Architecture Work Products	Segment Architecture Review Comments and Approval (conducted by EA Practice)	Enterprise Architecture
Update Work Plan and Update Segment Architecture Dashboard Capture “Lessons Learned”	Implementation Plan (Template 23)	Microsoft Project Plan (Template 5) Segment Architecture Dashboard updated “Lessons-Learned” Documentation	

Referenced Work Product Templates

The table below identifies the reference number for each work product template referenced in the Strategic Alignment stage (output column), and describes the specific questions supported by completion of each work product. References are provided for the work product templates in Section 3.

Table 2-8: Strategic Alignment Stage Work Product Questions

Template #	Name	Question(s) Answered
19	Conceptual Segment Architecture	How are individual opportunities brought together to create a single segment-level vision?
20	Strategic Alignment Analysis	How does the segment-level vision support agency goals and objectives, and EA and cross-agency initiatives?
21	Reuse Plan	Do opportunities exist to reuse business processes, information assets, service components, and technology to achieve target performance gains?
22	Workforce Capabilities Analysis	Is the current workforce qualified to implement the target segment architecture?
23	Implementation Plan	What are the proposed tasks, milestones, and schedule for segment architecture implementation?
24	Funding Strategy	How will implementation of the segment architecture be funded?
25	Segment Architecture Work Product Outline	How should the final segment architecture work product be packaged?
26	Decision Paper 3	Can opportunities be achieved in a reasonable timeframe with available resources and in compliance with the enterprise vision?



Program Management

Develop an executable program management plan tied to enterprise performance measures and controls. The program management plan outlines funded projects executed at the opportunity level.

Program Management, the only stage in the *Operate* phase, is executed at the segment level. This stage defines an executable Program Management Plan, including detailed project definitions and dependencies, to achieve results (Note: the Program Management Plan is not an investment plan and must be developed to a sufficient level of detail to support program/project coordination, execution, and monitoring). The Program Management stage includes a clear hand-off from the Program Manager to project managers responsible for the execution of individual implementation projects using standard project management methods and the system development life cycle (SDLC). Summary information from the Program Management Plan is provided to update the IT Master Schedule and monitor progress toward the implementation of segment architecture as part of HUD's business and IT modernization roadmap.

The target outcomes of the Strategic Alignment stage are:

- Hand-off to program/project execution team(s)
- Increased understanding of executable plans to achieve performance improvements
- Increased reuse through project management and SDLC integration

Program Management is part of the Operate phase and is executed continuously. The estimated level of effort (elapsed time) to develop the initial Program Management Plan is 10-15 days.

Process Description

Table 2-9 outlines each step in the Program Management stage including inputs and outputs. References are provided to the work product templates in Section 3. The reuse column identifies potential opportunities to reuse work products developed by each step.

Table 2-9: Program Management Stage

Process	Input	Output	Reuse
Develop Program Management	Conceptual Segment Architecture (Template 19) Implementation Plan (Template 23) Funding Strategy (Template 24)	**Program Management Plan (Template 27)** Individual Project definitions Major milestones and performance measures Internal/external dependencies Resource allocation Contract/Acquisition Plan	ITIM IT Master Schedule Program Communications Project Management /Initiation

Process	Input	Output	Reuse
Assign Project Managers	**Program Management Plan (Template 27)**	**Updated Program Management Plan (Template 27)** Project management assignments Handoff from IPT to Program/Project Managers for execution	Project Management
Conduct Project Manager Orientation Session Turnover segment work products to project teams	Segment-level and opportunity-level work products	Facilitated Segment Orientation Session Work Product Turnover (Template 28)	Project Management SDLC
Execute Projects	HUD Project Management Guidelines System Development Lifecycle (SDLC)	Standard project management work products	Project Management
Update Program Management Plan Capture "Lessons Learned"	**Program Management Plan (Template 27)** Standard project management work products	**Updated Program Management Plan (Template 27)** "Lessons-Learned" Documentation	ITIM IT Master Schedule

Referenced Work Product Templates

Table 2-10 identifies the reference number for each work product template referenced in the Program Management stage (output column), and describes the specific questions supported by completion of each work product. References are provided to work product templates in Section 3.

Table 2-10: Program Management Stage Work Product Questions

Template #	Name	Question(s) Answered
27	Program Management Plan	What are the individual projects, milestones, and internal and external dependencies? What are the resource requirements and contract/acquisition requirements?

3 Work Product Templates

The following section describes recommended work product templates associated with each step of the segment architecture development process. Work Product Templates are referenced in the process description in Section 2.0. Templates are sequentially numbered and provided in the order they are used in the process.

Work product templates should be used as reference material. They offer integrated product teams (IPTs) content, considerations, and in some cases, suggested work product formats. The work products described below should be developed with maximum "reuse" in mind. Each work product should be constructed so that its contents can be reused to support a variety of parallel initiatives such as the development of an IT investment business case, execution of the Systems Development Life Cycle (SDLC) and departmental communications.

Each segment architecture work product is intended to answer one or more key questions. Once a given question is answered, IPTs are encouraged to document the answer and move to the next step in the process. Teams should focus their efforts on completely answering the questions provided with each template. IPTs are also encouraged to use existing material, prior art or different forms of information as long as key questions are fully addressed and documented.

Each work product template is "stamped" with a descriptor box similar to the graphic below. The stamp provides descriptive information for each template. The stamp offers reference points orienting readers to the summary process graphic found in Section 1 Figure 1-2.

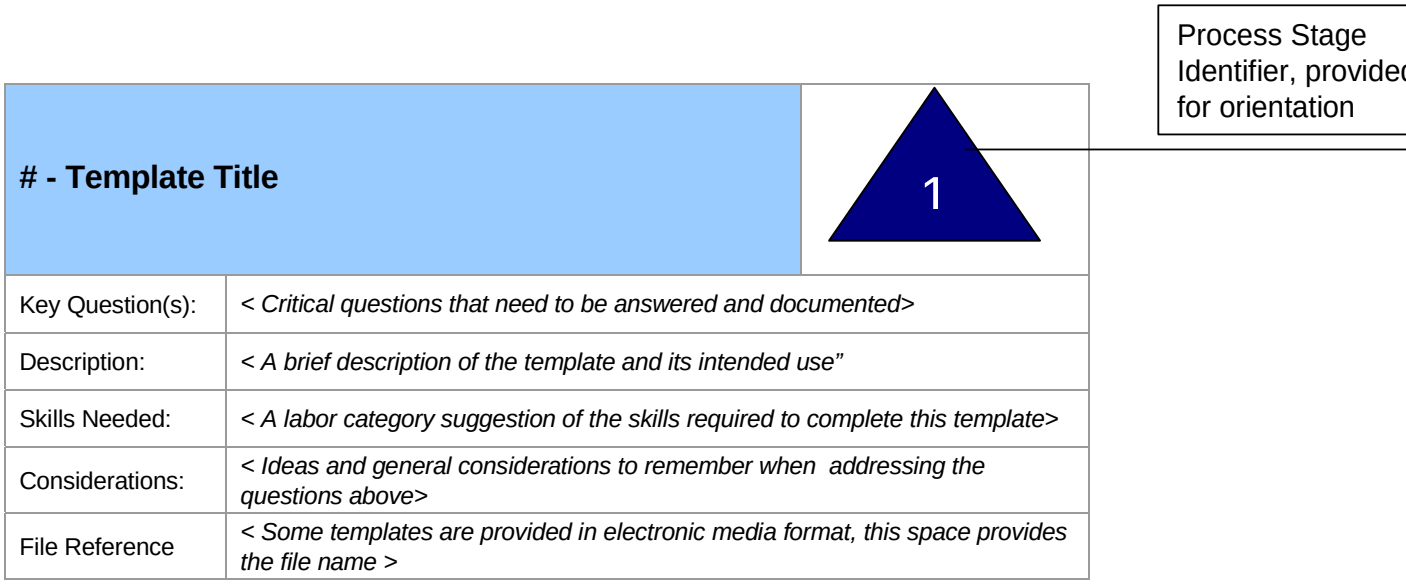
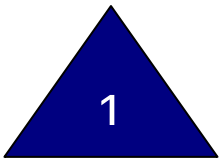
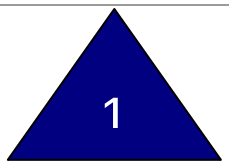


Figure 3-1: Work Product Template Descriptor Box



Opportunity Analysis

The following templates assist in reviewing the segment scope and applying segment scope and business and information management needs (drivers) to identify potential opportunities for improvement.

1 – IPT Roles Matrix and Roster	
Key Question(s):	• What skill sets are required to address segment architecture needs? • Are those personnel available for IPT assignment? • Do they understand their roles?
Description:	IPT Roles Matrix and Roster describes personnel roles by project phase and identifies the staff member(s) assigned to the role.
Skills Needed:	Program Management
Considerations:	IPT staff members produce many of the work products found throughout the segment process. The IPT requires differing skill sets in different stages in the process. Be prepared to move personnel into the appropriate role at the onset of each stage.
File Reference:	T1 Roles Matrix and Roster.xls

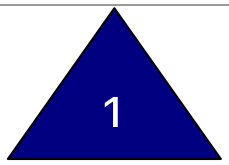
Instructions:

An IPT approach is strongly recommended for segment architecture development. IPT membership is made up of multi-functional stakeholders working together to execute a decision-based process. This team is empowered to make critical lifecycle decisions for the segment.

Implementation of segment IPTs represents a transition from a functional stovepipe focus to a customer and product focus. Teamwork within the framework of the IPT drives the process into a mutually reinforcing relationship that helps remove barriers to implementation and results. Business, product, and system development activities change and evolve over the life the segment project. IPT team membership and leadership will likewise evolve. The assigned IPT Program Manager uses the Roles Matrix throughout the segment architecture development process to identify and staff the IPT.

Template:

T1 Roles Matrix and Roster.xls

2 – Segment Initiation Package	
Key Question(s):	• What is the segment scope and what are the drivers for business and IT modernization? • What is the baseline operating environment?
Description:	The Segment Initiation Package is prepared in advance of the Opportunity Analysis stage and is used in the kick-off meeting. It contains a segment architecture development process overview and baseline and historical information. The information is used to frame segment visioning discussions.
Skills Needed:	Enterprise Architecture and/or a strategic view of a segment
Considerations:	The Segment Initiation Package information summarizes segment information. It is used as a basis of discussion during the Facilitated IPT Session. It will contain gaps in knowledge, but should provide enough information on which to base vision and opportunity statements. The facilitated session should be a well coordinated and facilitated meeting. Stakeholders are given baseline segment information and provide potential segment opportunities with criteria for ranking each opportunity. An acceptable outcome from the Facilitated Session is that no opportunities presently exist for performance improvement in this segment or that the opportunities identified do not meet with present organizational priorities.
File Reference:	T2 Segment Initiation Package.ppt

Instructions:

This work product is developed then delivered in the Facilitated Session with IPT participation. It represents a kick-off of IPT activities and a hand-off from the Enterprise Architecture team to the IPT. During the Facilitated Session, the Program Manger provides a segment development process overview. The EA team offers a Segment Orientation and the Facilitator gathers segment-level opportunity and prioritization criteria. The session is concluded with the introduction of project timelines, tasks, and assignments. In the event no opportunities are identified, the Program Manager assigns a team to document these finding in a formal decision paper (Template 1).

A draft agenda is provided below and reflected in the Microsoft PowerPoint template:

- Welcome and Introductions
- Segment Architecture Development Process
- Segment Orientation
- Cross Agency Initiatives
- Potential Opportunity Identification
- Opportunity Prioritization Criteria
- Schedule / Assignments

Ideas for presentation work product development are included in the Microsoft PowerPoint template referenced above. Ideas for presentation and content development are provided below.

Segment Architecture Development – Process Overview:

The Facilitated Session begins with a brief overview of the segment architecture development process addressing:

- What is a segment?
- Where does it fit in a solution life cycle?
- Why is a segment developed and how?

Enterprise Architecture Segment Orientation:

The EA Team researches and develops a presentation for the IPT from the best available segment information. This portion of the Facilitated Session represents a formal hand-off of information from EA to the IPT. It offers the IPT a strategic overview of the segment and highlights gaps and potential areas for performance improvement.

The EA team may find data for their presentation from the following sources:

- Enterprise Architecture models and information
- Enterprise Architecture Transition Plan or an IT Master Schedule
- ITIM Portfolio
- OMB 300 Business Cases
- Business and IT Performance Measures
- Departmental and organizational strategic plan(s)
- Interagency directives and alignment initiative
- Stakeholder interviews
- Technical system descriptions, standards or high level architecture
- Program Assessment Rating Tool (PART) Program Assessments and Ratings
- Inspector General (IG) Findings

The presentation includes a slide or two for each of the following topics. Notes for some of the more difficult topics are provided below:

- Segment Drivers
- Segment Business / Services
- Segment Stakeholders
- Segment Investment Summary
- Segment Technology
- Segment Performance Measures
- Summary EA Assessment

Notes on Segment Drivers:

Drivers provide a narrative description of the strategic mission for the segment. The justification component defines the business case for the IT investment and describes the relationship between business and information requirements and key strategic, legislative, management, and performance drivers. This could include audit findings and other oversight drivers (e.g. GAO, IG findings, PART).

A common technique to identify drivers is a Strengths, Weaknesses, Opportunities, and Threats (SWOT) analysis. This asks and answers the question, "What specific things must we do to maintain our strengths, improve of weaknesses, exploit our opportunities, and minimize our threats?"

Drivers provide insight into the root cause of some gaps and help prioritize opportunities form improvement. Consider the following broad categories:

- Legislative – related to Federal laws and regulations with the force of law.
- Organizational – related to the culture, politics, and priorities of HUD
- Business – related to changes in how HUD provides housing assistance
- Technology – related to changes in the various technologies reviewed by HUD. These can be increased capabilities or new vulnerabilities.
- Financial – related to availability of funding and funding trends
- Market – Related to economic, business, or citizen demand, or technical changes in the market

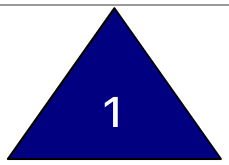
Examples of Justification/Drivers for an Identity Management segment could include:

- Citizens and businesses look to the Government to protect sensitive and personal information, yet these customers also expect HUD to make it easy to access information or conduct business with HUD.
- Implementing a federated approach to Identity and Authentication Management, using a common framework, allows agencies, departments, and partners to establish trust relationships for sharing information across organizational boundaries. Such trust expedites user access to sensitive information and extends interoperability among and across communities of interest.
- The HUD Identity Management segment will assist agencies and departments in development of request for proposals (RFPs) and Business Case development and influence Portal projects and application solutions. HUD's Identity Management components, tools, and Web services can be shared to expedite future development and to reduce maintenance and operational costs.

Template:

T2 Segment Initiation Package.ppt

Note: Additional information is required to conduct the facilitated session. This information is collected and planned for by the Facilitator and Program Manager in Templates 3 and 4 below.

3 – Potential Opportunities List	
Key Question(s):	• What are the potential business and IT modernization opportunities in this segment?
Description:	This work product is generated during the facilitated session. IPT members brainstorm potential opportunities for performance improvement. The resulting work product is a list of potential performance improvement opportunities accompanied by one or more standard benefit categories.
Skills Needed:	Facilitation, Brainstorming
Considerations:	The main result of a brainstorm session may be a draft solution to a problem, a list of ideas for an approach to a subsequent solution, or a list of ideas resulting in a plan to find a solution. Allow IPT members to openly express their ideas. Capturing ideas anonymously may result in a broader set of ideas.
File Reference:	T2 Segment Initiation Package.ppt Slide titled "Potential Opportunities Identification" T3 Potential Opportunities List.xls

Instructions:

This portion of the Facilitated Session is conducted by the facilitator as a brainstorming session.

Potential opportunity ideas are captured, discussed and described. A standard benefit category is assigned to each opportunity. Standard benefit categories are provided by OMB.

Opportunities are not prioritized during this stage.

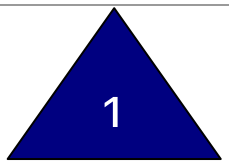
Standard Benefit Categories include:

- Cost savings
- Cost avoidance
- Improved service to citizens
- Improved mission performance
- Improved management and use of information including greater dissemination, reduced collection burden on the public, and greater information sharing and collaboration
- Technology consolidation and standardization

Make sure to capture an adequate description and associated implementation assumptions for each potential opportunity.

Template:

T3 Potential Opportunities List.xls

4 – Opportunity Prioritization Criteria	

Key Question(s):	• What criteria are used to prioritize potential business and IT opportunities?
Description:	This work product is generated during the facilitated session. IPT members determine how opportunities will be prioritized. The resulting criteria are used throughout the segment process to focus the IPT and working groups on those opportunities that offer the largest performance gains.
Skills Needed:	Facilitation, consensus building
Considerations:	This is a consensus building exercise. Please remember, achieving consensus requires serious treatment of every group member's considered opinion.
File Reference:	T2 Segment Initiation Package.ppt (see slide titled “Prioritization Criteria”) T4 Opp Prioritization Criteria.xls

Instructions:

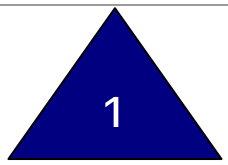
Opportunity prioritization criteria seek to identify opportunities that produce the largest performance gains. It is helpful to arrange the criteria in categories and assign a numeric value weighted percentage to each category. Assigning the values to the criteria can occur during the initial facilitated session.

The criteria included in the template are provided as an example and can be tailored to the needs of a specific segment. The use of a weighting level is optional, and is best used when there is a substantial variance in how the importance of the individual criteria is perceived within a segment. If weighting levels are used, a numeric value helps to quickly resolve priority discrepancies.

Opportunities are not prioritized during this stage.

Template:

T4 Opp Prioritization Criteria.xls

5 - Working Session Minutes	
Key Question(s):	• What are the critical outcomes, decisions and actions from the facilitated session?
Description:	A suggested outline for Working Session Minutes
Skills Needed:	Note taking
Considerations:	Only capture relevant outcomes, decisions and actions. Make sure names and due dates accompany all action items. Working session minutes should not be a transcript of the session.
File Reference:	T5 Meeting Minutes.doc

Instructions:

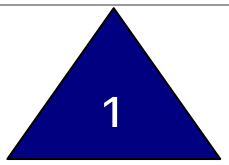
Delivery of Working Session Minutes should be accompanied by other documented outcomes from the facilitated session. Consider including:

- Copy of presentation charts
- List of Potential Opportunities
- Completed Prioritization Criteria
- Decision Paper (Template 10)

The meeting minutes provide the facts needed to more fully document the potential opportunities and assist in determining which opportunities should be pursued and further developed.

Template:

T5 Meeting Minutes.doc

6 – Work Plan	
Key Question(s):	• What are the critical steps and milestones to develop the segment architecture?
Description:	Microsoft Project Plan and necessary text descriptions
Skills Needed:	Program Management, project planning
Considerations:	The Microsoft Project plan offers a work breakdown Structure (WBS) for standard segment architecture development. This standard will need to be modified to insert or delete tasks not relevant to the construction of a particular segment. No task dependencies have been included in the template.
File Reference:	T6 Work Plan.mpp

Instructions:

A formal work plan has intentionally not been developed until this point in time. In the event no viable opportunities were identified in the Opportunity Analysis Stage, there would be no need for a work plan.

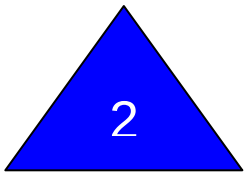
If opportunities were identified in this stage, the Program Manager should draft a plan encompassing only the next stage in the segment architecture development process, i.e. the Opportunity Prioritization stage. During this stage, the first of three critical questions is asked and answered: Do meaningful opportunities for performance improvement exist? If the answer to this question is “no,” then further planning is unnecessary

Provide additional text descriptions as necessary.

Provide an update to the segment architecture status through the EA team (i.e., dashboard discussed in Section 1 of this document).

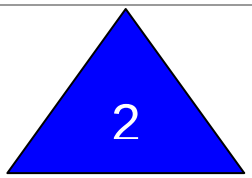
Template:

T6 Work Plan.mpp



Opportunity Prioritization

The following templates assist in reviewing candidate opportunities and applying evaluation criteria to prioritize and select opportunities for improvement.

7 - Baseline Information Gaps	
Key Question(s):	• Are there gaps in the information to prioritize or disqualify potential opportunities? • What additional information will help prioritize or disqualify segment opportunities?
Description:	This report identifies pieces of missing information and reconciles assumptions made in the Opportunity Analysis stage.
Skills Needed:	Business subject matter expert, IT Engineer, Segment Architect
Considerations:	This report should consider the potential interaction between opportunities at a segment level and document dependencies and logical sequencing.
File Reference:	T7 Baseline Information Gaps.doc

Instructions:

Review and analyze each of the following work products.

- Segment Initiation Package
- Potential Opportunities List
- Opportunity Prioritization Criteria
- Meeting Minutes

The intention of developing baseline information gaps is to determine if additional information is needed to prioritize, combine, or eliminate potential performance improvement opportunities from the list.

Initially, determine if any opportunities can be removed from the list based on prioritization criteria.

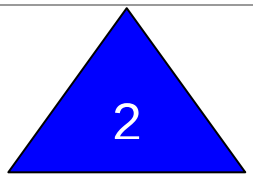
The following activity is conducted at a segment level viewing opportunities as potential functions. Organize the list of opportunities from the initiation session. Document interdependencies between potential opportunities by listing them and noting a logical implementation sequence. Ascertain if information is missing to assist in prioritization or solution architecture development. Make a note when an opportunity is not dependant on other opportunities. Also, note dependencies on major prerequisite events. Determine if any of the opportunities overlap and combine opportunities where necessary.

The Program Manager assigns IPT members responsibility to resolve the identified information gaps and provide augmentations to the Segment Initiation Package (Template 2). IPT members are cautioned to provide summary segment level information.

Template:

T7 Baseline Information Gaps.doc

8 - Initial ROM TCO



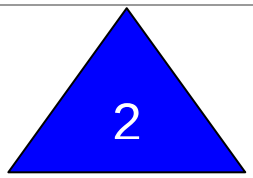
Key Question(s):	• What is the rough order of magnitude (ROM) and Total Cost of Ownership (TCO) estimate to operate the baseline environment?
Description:	The ROM TCO estimate describes current segment operating costs by category. The initial ROM TCO is used to help substantiate performance improvements and reuse.
Skills Needed:	Portfolio Investment, Business Management, estimating capabilities
Considerations:	Budgets are rarely broken into categories that are easy to summarize for purposes of a ROM TCO. In some cases an allocation or portion of a budget will need to be estimated. The IPT should document the basis of estimate for each summary ROM TCO category.
File Reference:	T8 Initial ROM TCO.xls

Instructions:

The key to a providing a decent ROM TCO estimate is to provide a clear “basis of estimate” and to cite the “sources of information” used in the estimate. A basis of estimate is the justification for arriving at a particular cost estimate. This justification can include the estimating methods, assumptions, or the approach taken to estimate. A valid “source of information” is to state that no information was attainable and the ROM TCO was based on IPT estimates.

Template:

T8 Initial ROM TCO.xls

9 – Opportunities Analysis Report (Part I)	
Key Question(s):	• Which opportunities will be forwarded to the Solution Architecture stage?
Description:	In Part I, this report provides the results of segment-level analysis. It describes those opportunities that should be forwarded to the Solution Architecture stage.
Skills Needed:	Segment SME, Segment Architecture, Analytical
Considerations:	Only a portion of this template will be completed during this stage. The report is completed in Stage 3 when solution architecture is developed for priority opportunities.
File Reference:	T9 Notional Opportunity Performance.ppt T9 Opportunity Analysis Spreadsheet.xls T9 Opportunity Analysis Report.doc

Instructions:

In a facilitated session, the IPT determines which opportunities, if any, will be forwarded to the Solution Architecture stage. In the event no opportunities are recommended, the IPT documents its finding in Decision Paper 1 (Template 10) and discontinues segment development.

The IPT uses the following information to rank opportunities:

- Opportunity Prioritization Criteria (Numeric weights)
- Updated Potential Opportunity List
- Notional Opportunity Performance
- Baseline Information Gaps (addressed in summary form)
- Baseline ROM

Conduct a brief consensus gathering session to determine the current notional segment performance. This segment level performance characterization is used as input to the Opportunities Analysis Report. The IPT completes a “notional segment performance assessment” to characterize current performance in the functional areas represented by the opportunities. The sample below suggests that greater performance gains would be achieved by implementing opportunity 4. (See T9 Notional Opportunity Perfromance.ppt)

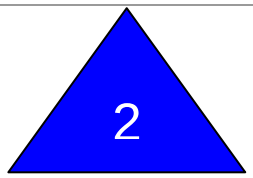
Using the approved opportunity ranking criteria and other supporting information above, the IPT ranks each opportunity. A High (3), Medium (2), or Low (1) rank is given to each priority criteria for each opportunity. Optionally, mathematical priority weights are applied to determine which opportunity has the highest priority based on the criteria created in the Opportunity Analysis stage.

Using the mathematical ranking as a starting point, the IPT reviews other supporting information and compiles a list of opportunities to be forwarded to the Solution Architecture stage.

The resulting disposition of each original potential opportunity is documented in of the Opportunity Analysis Report (Part I). The Baseline ROM is provided as an appendix to this report.

Templates:

T9 Notional Opportunity Performance.ppt
T9 Opportunity Analysis Spreadsheet.xls
T9 Opportunity Analysis Report.doc

10 – Decision Paper 1	
Key Question(s):	• Do opportunities exist to improve business operations and information management?
Description:	This paper documents the first formal decision point in the segment architecture development process. It summarizes the disposition of segment opportunities during the Opportunity Analysis and Opportunity Prioritization stages.
Skills Needed:	Program Management, Writer
Considerations:	This document is an executive summary of decisions made in the Opportunity Prioritization stage.
File Reference:	T10 Decision Paper 1.doc

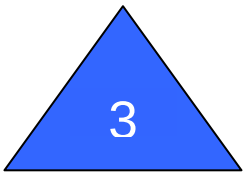
Instructions

Document the background, findings, rationale, and opportunity disposition discovered during the Opportunity Analysis and Priorities stages. If opportunities are rejected, briefly document the removal rationale.

This formal decision paper is intended as a managerial and executive status of the segment architecture development process.

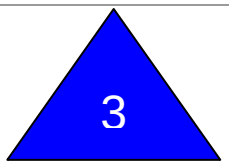
Template:

T10 Decision Paper 1.doc



Solution Architecture

The following templates assist in developing solution-level architecture, implementation alternatives, and impact analysis for selected opportunities to improve business and information management.

11 – Baseline Concept of Operations	
Key Question(s):	• How do current functional and operational components work together to achieve business objectives?
Description:	A one-page graphic illustrating the current situation or operating environment for improvement opportunities. The graphic is intended to build consensus within the IPT on the scope of the opportunity and current processes, data stores, applications, and/or stakeholders.
Skills Needed:	Business Architect, Facilitator
Considerations:	The concept of operations (CONOPS) diagram is used to facilitate communication between stakeholders and to facilitate architectural working sessions. The CONOPS diagram is a “cartoon-like” illustration of a business operation and/or environment. The format, look, and feel of the product are less important than creating a picture that helps foster communication and build consensus.
File Reference:	None

Instructions:

A small group of IPT members should develop a “strawman” concept of operations (CONOPS) diagram and use this starting point to conduct a facilitated session with IPT members to complete the diagram. The following OV-1 diagram from the Department of Defense (DoD) Architecture Framework is an example of a CONOPS diagram.

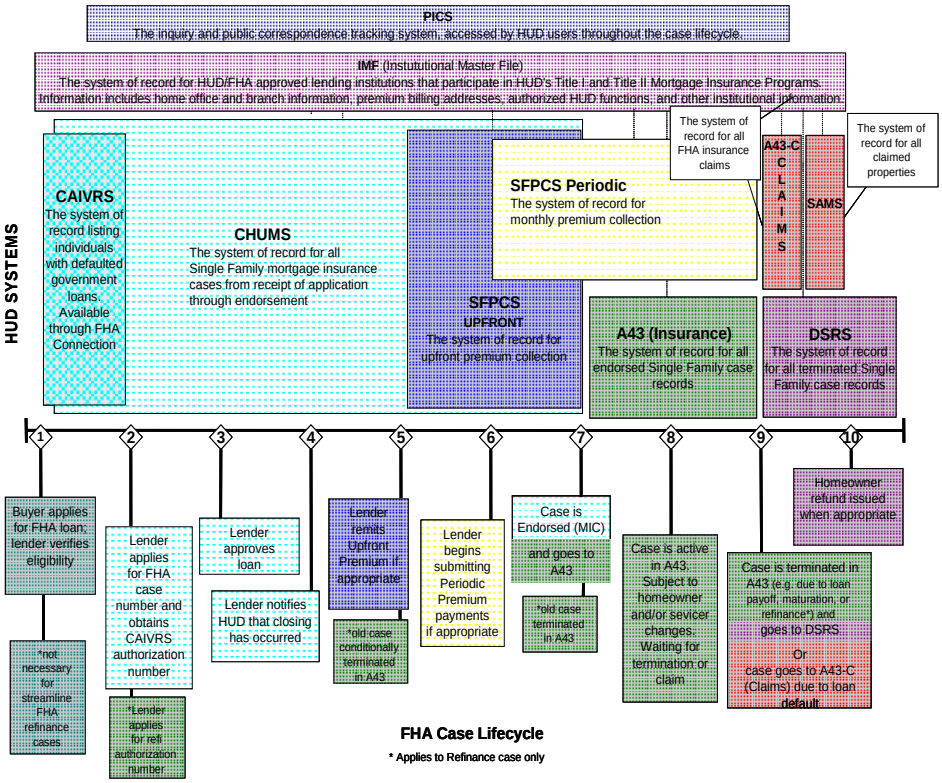
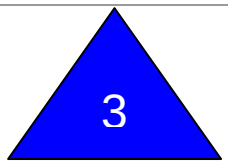


Figure 3-2: Sample Baseline CONOPS

Template:

None provided.

12 – Target Concept of Operations	
Key Question(s):	• What are the major functional characteristics of proposed business operations? • How will proposed operations be executed to achieve business process improvements?
Description:	A one-page graphic illustrating the target environment for priority opportunities. The graphic is intended to build consensus within the IPT on the scope of the opportunity to improve the current situation and realize target performance gains. Development of the CONOPS diagram is an important first step in the development of target architecture.
Skills Needed:	Business Architect, Facilitator
Considerations:	The CONOPS diagram is used to facilitate communication between stakeholders and to facilitate architectural working sessions. The CONOPS diagram is a "cartoon-like" illustration of a business operation and/or environment. The content and format of the target CONOPS diagram is flexible and is dependent upon the nature of opportunities for improvement.
File Reference:	None

Instructions:

A small group of IPT members should develop a "strawman" target CONOPS diagram and use this starting point to conduct a facilitated session with IPT members to complete the diagram. The OV-1 diagram from the DoD Architecture Framework is an example of a CONOPS diagram.

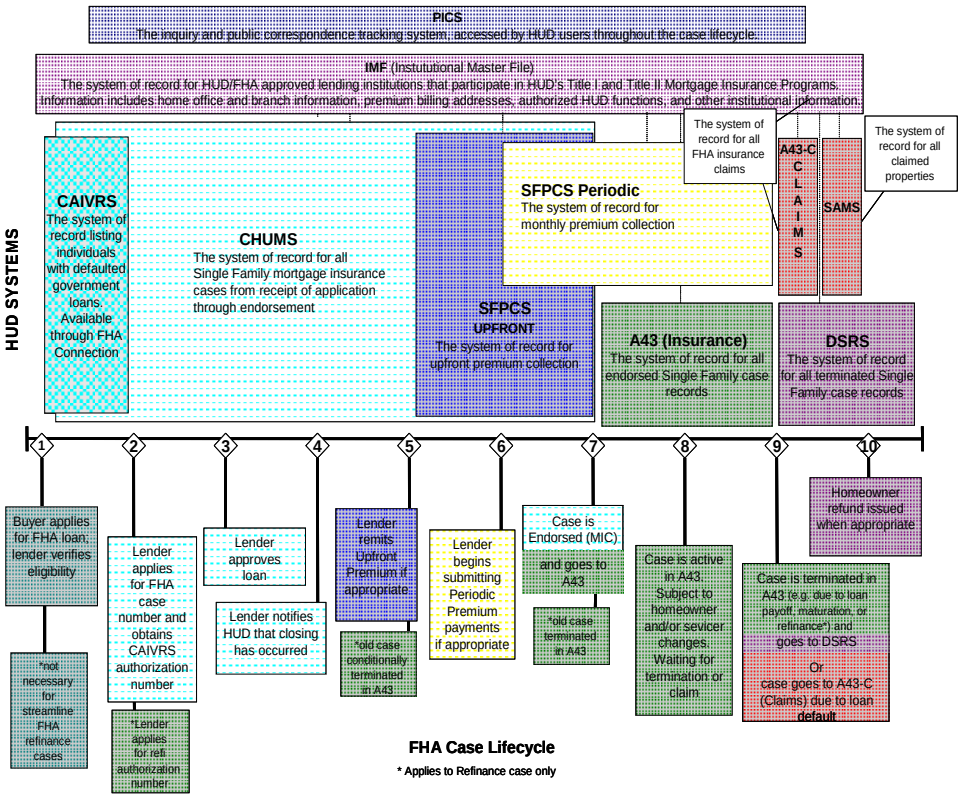
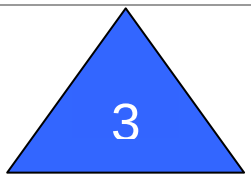


Figure 3-3: Sample Target CONOPS

Template:

None provided.

13 – Baseline & Target Architecture	
Key Question(s):	What is the right level of baseline and target information to identify and describe performance gaps?
Description:	These two sets of work products represent a before and after snapshot for a given solution architecture. The two sets of business and technical models are used to compare and contrast the “AS IS” and “TO BE” states for priority opportunities. These work products feed the gap analysis process and are reconciled to create segment-level architecture.
Skills Needed:	Segment Architecture, System Design, Business Management and institutional knowledge of how the segment operates.
Considerations:	The key to success in this step is to begin the Systems Development Life Cycle Initiation stage and provide solution architectures that drive results and performance improvements. Consider using Integrated Development Environment modeling tools to develop baseline and target architecture. Using these tools may reduce system design and development costs. (Note: it is not necessary to own or use “tools sets” to develop these work products.) Individual architecture products are not stand-alone entities. Products represent depictions or subsets of information that have clear relationships to other aspects of the solution. Choose models that expose business and technical requirements and reveal performance improvements with the minimum amount of effort. Always use the same modeling techniques for each component piece other than the Baseline and Target Architecture.
File Reference:	Performance Reference Model (September 2006) Technical Reference Model or target technology standards Segment Data Architecture Development Methodology Department of Defense Architecture Framework (DODAF)

Instructions:

Opportunities are transformed to "solutions" during this stage. Prior to assigning individual opportunities to IPT members for baseline and target architecture development, consider aggregating opportunities that logically address related performance improvements or whose solution architecture is inherently interrelated. When developing baseline and target architecture the IPT operates simultaneously at both the segment level and solution level. This approach maximizes technology standardization and reuse through solution integration.

The Baseline and Target Architecture work products should directly support the initial phases of an organization's Systems Development Life Cycle (SDLC). These work products are included as reference materials in the Segment Architecture Work Product Outline (Template 25). In the Program Management stage, work products are formally turned over to project implementation teams for use in the SDLC. All work products in this section are developed on a solution-by-solution basis. The formal reconciliation of solution architecture is accomplished in the Strategic Alignment stage.

Building from the Baseline and Target Concept of Operations assemble the models listed below for each opportunity (Note: Remember to apply principle #1 and develop "just enough architecture, just in time" to support decisions).

Assign IPT resources to develop baseline and target architecture addressing the following areas:

Table 3-1: Expected Results by Baseline & Target Models

Baseline & Target Models	Expected results
Business Architecture	Expose function, process, organization roles and information flows
Stakeholder Relationships	Reveal stakeholder roles to functions
Performance Architecture	Defines performance measures to monitor results
Data Architecture	Reveals impacted data entities Proposes data stewardship
Technology Architecture	Proposed technology strategy and rationale including product recommendations, infrastructure impact and data migration
Procurement / Contract Architecture (Baseline only)	Exposes disconnects between functional coverage and required delivery

Sample models and template considerations follow. Files referenced in this section refer to instructional materials based on mature architecture methodologies and models.

Business Architecture (Functions and Processes):

The Business Architecture describes the operations and functions that are normally conducted in the course of achieving a mission or a business goal. It describes capabilities, operational activities (or tasks), input and output flows between activities, and Input and output activities that are outside the scope of the solution.

High-level operational activities are decompositions of a Business Area, or a Business Sub-Function as published in OMB's Business Reference Model [OMB, 2003].

In order to construct the Business Architecture consider using DoDAF models to develop an operational view of the nodes and information exchanges (OV-2, OV-3). The value of this approach

is that the Node Connectivity Description consolidates multiple use cases into a single usable entity.

The Node Connectivity Description graphically depicts the operational nodes (or organizations) with "needlines" drawn between those nodes that indicate a need to exchange information. The graphic includes internal operational nodes (internal to the architecture) as well as external nodes. It exposes users groups, functions, information exchanges for both internal and external organizations.

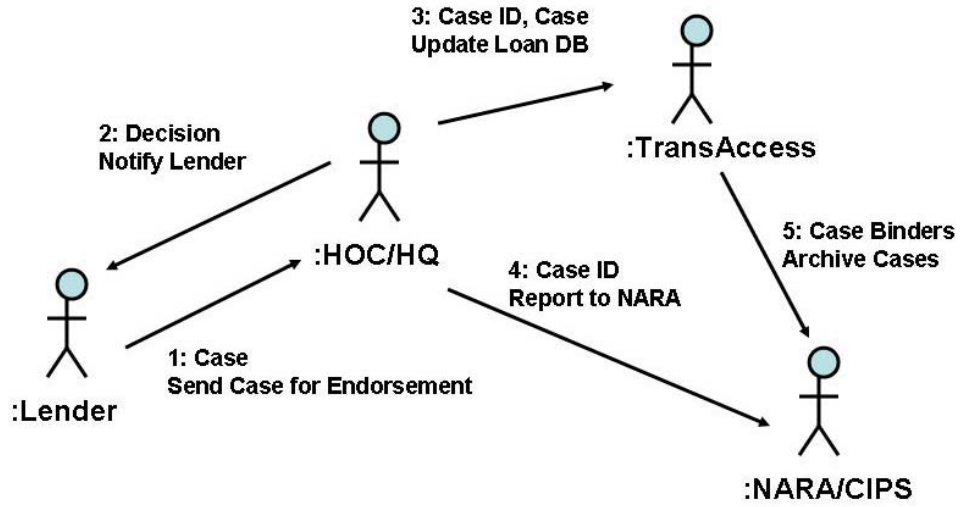


Figure 3-4: Sample OV-2 Node Connectivity Description Diagram

An operational node is an element of the business architecture that produces, consumes, or processes information. A needline documents the requirement to exchange information between nodes. The needline does not indicate how the information transfer is implemented. Needlines are represented by arrows (indicating the direction of information flow) and are annotated with a diagram- unique identifier and a phrase that is descriptive of the principal types of information exchanged. It is important to note that the arrows on the diagram represent needlines only. This means that each arrow indicates only that there is a need for some kind of information transfer between the two connected nodes. There is a one-to-many relationship from needlines to information exchanges (e.g., a single needline on Node Connectivity Description diagram represents multiple individual information exchanges).

The Node Connectivity Description should also illustrate requirements to exchange information between operational nodes and external nodes (i.e., operational nodes that are not strictly within the scope of the subject architecture but that act as important sources of information required by nodes within the architecture or important destinations for information provided by nodes within the architecture). The operational activities performed by a given node may be listed on the graphic, if space permits. The Node Connectivity Description focuses first on the operational nodes and second on the activities.

When complete the Node Connectivity Description should contain the following information.

- External and internal stakeholders
- Type of information exchanged
- How and when the information is exchanged
- Standards used to exchange information
- Legislative and security requirements

If there is a need to drill down deeper due to the inherent complexity in the solution (to expose performance gains between the baseline and target architectures), the DoDAF specifies how to define and describe lower levels of detail for the Node Connectivity Description in their OV-3 template.

In the event business processes are projected to change due to the implementation of the proposed solutions, the business process can be modeled using Business Process Modeling Notation (BPMN) for the Establish Program process[1].

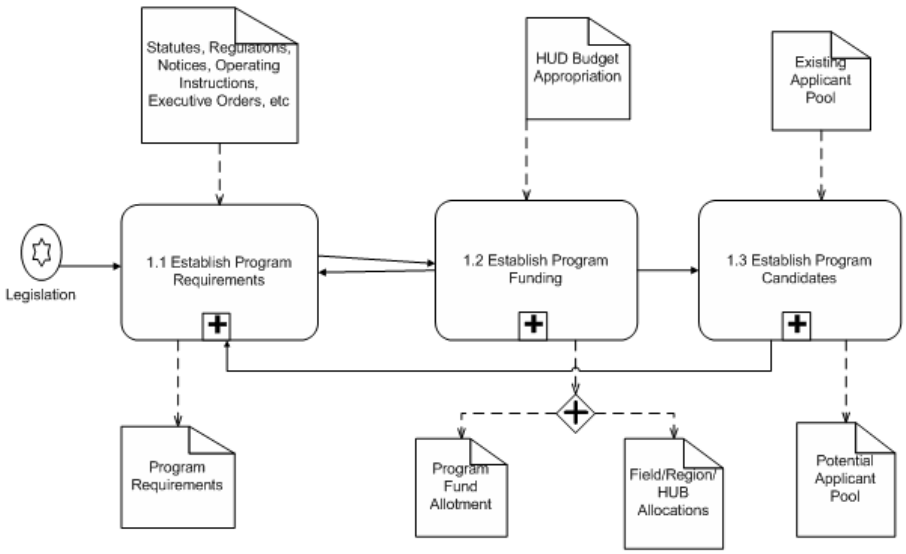


Figure 3-5: Sample BPMN

Business process documentation should contain:

- Business process activities
- Sequence and dependencies between the activities
- Data exchanged between the activities
- Security requirements to exchange data.

Upon completion of the baseline and target business architecture the IPT should be able to clearly articulate performance gain proposal(s) and revisions in the way business is operated to achieve those gains.

Stakeholder Relationships:

Use the initial segment level stakeholder analysis as a starting point to develop these models.

Make note of major functions or stakeholder groups that will be replaced in the target architecture. Highlight organizational, stakeholder and functional redundancies with accompanying text.

[1] *Sample: excerpt from Segment Data Architecture Development Methodology*

Table 3-2: Sample Stakeholder Relationships Table

Internal & External Operational Node	Stakeholder Group by Role	(ROM) Number of Stakeholders in group	Major Functions

Performance Architecture:

The before and after picture of the Performance Architecture provides two distinct values to the proposed solution architecture as listed below:

- Articulates specific performance gains in terms of business metrics
- Provides business metrics by which solution implantation can be measured

The organization's Enterprise Architecture Performance Reference Model (PRM) should be used as a guide to developing baseline and target performance metrics assigned to a solution. Copy the form and format of PRM entries so that later re-integration with the PRM will be simplified. Consider OMB 300 business case requirements when capturing this data in order to simplify later business case development. Mapping performance measurements to organizational strategic goals substantiates the measure and helps build the business case for the opportunity.

Table 3-3: Sample Performance Architecture

Performance Measurement Identifier:				
Performance Measurement Description:				
Increase in Customer Satisfaction Index				
Measurement Method: Conduct e-mail survey				
Fiscal Year	**Baseline Metric**	**Planned Improvement**	**Target Metric**	**Target Metric Due Date**
2007	38%	48%	Median customer satisfaction index=/> 86%	12/31/09
2008	86%	90%	Median customer satisfaction index=/> 90%	12/31/10
Strategic Goal(s)			**Strategic Objective(s)**	
Goal E: Embrace High Standards of Ethics, Management and Accountability			• E2: Improve HUD's management and internal controls to ensure program compliance and resolve audit issues. • E3: Improve accountability, service delivery and customer service of HUD and its partners. • E4: Capitalize on modernized technology to improve the delivery of HUD's core business functions.	
Measurement Area: Customer Results				
Measurement Category: Service Quality				
Measurement Grouping: Accuracy of Service or Product Delivered				

See HUD PRM (September 2006).

Data Architecture:

Data Architecture guidance is provided in HUD's Segment Data Architecture Development Methodology. The Segment Data Architecture Development Methodology (SDADM) is a phased, lifecycle approach to transition the HUD conceptual Data Reference Model (DRM) from a business view aligned with HUD's Business Reference Model (BRM) to a physical view used for the implementation of the data specification and information exchanges. The initial phases of the methodology define the high-level data requirements for the complete scope of a segment from both a business function and operational system perspective. The later phases of the methodology define detail requirements for targeted areas of a segment that have been selected for implementation (Figure 3-6).

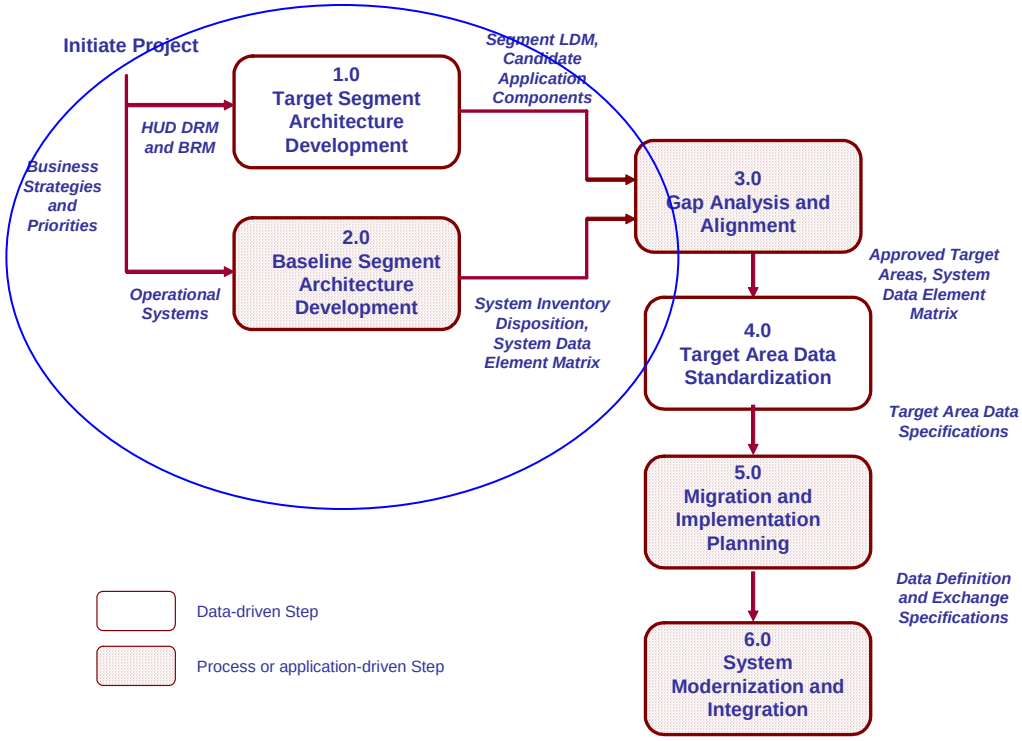


Figure 3-6: Segment Data Architecture Development Methodology (SDADM)

Only phases 1 and 2 of the methodology are executed at this point. Summary descriptions for the first two phases are provided below:

- **Phase 1: Target Segment Architecture Development**. This phase describes the steps required to decompose and detail the conceptual HUD DRM to a segment logical data model (LDM). The segment LDM in conjunction with the segment Business Process Models (BPMs) identifies logical application components or targeted areas that are evaluated for further development.
- **Phase 2: Baseline Segment Architecture Development.** This phase describes the steps to document the baseline architecture based on HUD's operational systems and data sources. The Target Area Data Models (TADM) derived from the segment LDM are further detailed based on the harmonization and standardization of the baseline data elements.

Details pertaining to data architecture models and templates for these two phases are provided in the SDADM.

Technology Architecture:

The Technology Architecture proposed technology strategy and rationale including product recommendations, infrastructure impact and data migration. In addition to text descriptions of the proposed technology strategy the baseline and target architecture should consider the following Models.

- Technical Reference Model Map
- Technology Forecast

The TRM Map identifies how the target architecture will fit into the current HUD's technical operating environment. By comparing target standard products, licenses and products to those required by the solution, the TRM Map aids in developing the acquisition, reuse, operations and infrastructure strategy.

Table 3-4: Technical Standards Profile

Domain	Category	Product	New or Existing	Site License? (Y/N)	License Requirement

Due to the inevitable time lapses between architecture design and procurement a Technology Forecast is recommend as part of the technology strategy.

The Technology Forecast provides forward looking information about technologies that could potentially affect the solution in the short, medium and long tern.

The System Technology Forecast defines the underlying current and expected supporting technologies that can be reasonably forecast given the current state of technology and expected improvements. New technologies should be tied to specific time periods. It is recommended that you follow the approach describe in the DODAF to develop a summary of emerging technologies that impact the architecture and its existing planned systems (SV-9). The focus should be on the supporting technologies that may most affect the capabilities of the architecture or its systems.

The System Technology Forecast provides a detailed description of emerging technologies and specific hardware and software products. It contains predictions about the availability of emerging technological capabilities and about industry trends in specific time periods. The specific time periods selected (e.g., 6-month, 12-month, 18- month intervals) and the technologies being tracked should be coordinated with architecture transition plans. The forecast includes potential technology impacts on current architectures and thus influences the development of transition and target architectures. The forecast should be focused on technology areas that are related to the set of opportunities being addressed and should identify issues that will affect the target architecture.

Table 3-5: Technology Forecast

Technology Categories Related to Opportunities Pursued	Short Term (0-6 months)	Mid Term (6-12 months)	Long Term (12-24 months)
Data Management			New Oracle version likely
Operating Systems		Microsoft Vista Pilot Projects	Microsoft Vista Deployments

Technology Categories Related to Opportunities Pursued	Short Term (0-6 months)	Mid Term (6-12 months)	Long Term (12-24 months)
Physical Hardware		AMD Workstations added to standard base	

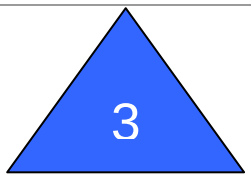
The technical strategy articulates reuse, new technology implementation, data migration, broad technical implementation. If possible, provide projected technical resource requirements based on a combination of the target business, stakeholder and technology strategies.

Procurement / Contracts Map: (Baseline Only)

A map of contracted services and procurement actions can help to expose gaps service delivery and detail functional and time based gaps. When compared to segment level objectives the contract map provides input to the reuse plan, the funding strategy and implementation plan.

Table 3-6: Sample Contract Map

Internal & External Operational Node	Contract Functions	Contract Term	Noted Baseline Gaps

14 – Gap Analysis	

Key Question(s):	• Where are the current functional, technical, and performance gaps between baseline and target architecture?
Description:	Gap analysis compares baseline and target architecture to identify areas for improvement in the baseline operating environment. The process involves determining, documenting, and approving the variance between the target solution architecture and current capabilities. This comparison is gap analysis.
Skills Needed:	Segment functional understanding, analytical skills
Considerations:	Gap analysis is performed at the opportunity level. A key element of gap analysis is the identification of performance gaps (i.e. the variance between current and target performance measures). Gaps are also identified for functional and technical areas.
File Reference:	T14 Gap Analysis.xls

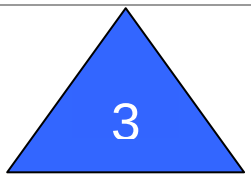
Instructions:

Gap analysis is based on the review and comparison of baseline and target architecture for priority opportunities. Individual gaps (variance) between the baseline and target architecture should be organized and presented using the following categories:

- **Performance gap**: Variance between baseline and target performance measures.
- **Functional gap**: A business function or process is not available in the baseline operating environment.
- **Technology gap**: A technology component or standard is not available in the baseline operating environment
- **Other**

Template:

T14 Gap Analysis.xls

15 – Alternatives and Impact Analysis Report	
Key Question(s):	• What are the implementation alternatives to address gaps between the baseline and target architecture? • What is the organizational impact of each alternative? • What is the preferred alternative?
Description:	Alternatives analysis identifies and evaluates solutions to close gaps between the baseline and target architecture and achieve meaningful performance gains. The evaluation of alternatives considers a series of impacts including cost, schedule, risk, standardization, and collaboration and reuse to determine the preferred alternative.
Skills Needed:	Program Manager, Enterprise Architect, Business and Technical SMEs
Considerations:	Alternatives and impact analysis should consider viable alternatives to close gaps and achieve target performance gains. Alternatives can include non-technical solutions.
File Reference:	T15 Alternatives and Impact Analysis.xls

Instructions:

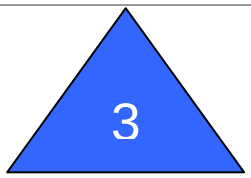
Individual alternatives are defined to close the gaps identified by the gap analysis. Implementation alternatives should be defined to address all gaps across all opportunities in the solution architecture phases, i.e. changes to existing manual business processes. Alternatives should include major "thematic" alternatives addressing major modernization or implementation approaches, e.g. custom development, service integration. The following information should be developed for each alternative:

- **Description**: A brief narrative description of the implementation alternative and major characteristics of the approach.
- **Cost**: Rough order of magnitude (ROM) total cost of ownership (TCO) for the implementation alternative over the program lifecycle. Cost estimates shall include staff (FTEs), contract support, equipment, facilities and other (discretionary) costs, e.g. travel.
- **Schedule**: An initial estimate of the time required to implement the alternative and achieve the target performance gains.
- **Alignment**: Assessment of strategic alignment of each alternative with HUD's enterprise vision (enterprise architecture and Vision 2010), enterprise business services, and relevant cross-agency initiatives. Alignment should evaluate the impact of the alternative on standardization (across each layer of the enterprise architecture) and reuse of technology and services.
- **Risk**: Describe the business and technical risks associated with the implementation of the alternative. The risk assessment shall address the availability and maturity of product and services, and the capability of the workforce to implement manage and implement the solution.

The definition and evaluation implementation alternatives results in the identification of the preferred implementation alternative to achieve target performance gains.

Template:

T15 Alternatives and Impact Analysis.xls

16– Implementation Plan and ROM TCO	
Key Question(s):	• What are the proposed tasks, milestones and schedule for implementation? • What is the expected Total Cost of Ownership (TCO) for the solution?
Description:	The implementation plan outlines the task, activities and milestones to take the architecture from the "drawing board" to the execution of projects, implementation of solutions, and the generation of results. A rough order of magnitude estimate is developed to verify cost-related performance gains.
Skills Needed:	Program Manager, Enterprise Architect, Business and Technical SMEs
Considerations:	The initial implementation plan and ROM TCO estimate is developed to a sufficient level of detail to verify that a clear relationship can be defined between the individual opportunities for improvement and target performance gains (decision point #2).
File Reference:	T16 ROM TCO.xls

Instructions:

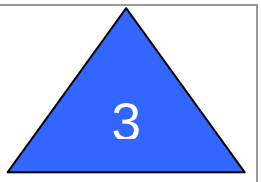
The initial version of the implementation plan (MS Project) is developed to a sufficient level of detail to support decision point #2, i.e. to ask and answer the question: is there a clear link between opportunities and meaningful performance gains? The implementation plan is develop using MS project and includes the following elements:

- **Defined projects**: Individual implementation projects of narrow scope and brief duration to implement solution architecture.
- **Sequencing plan**: A view of individual projects, providing visibility to the sequential rollout of individual elements of the architecture.
- **Dependencies**: Maps the dependencies between projects and other program and project milestones (including the maintenance and availability of legacy systems and services).
- **Performance Improvement Plan**: Summarizes the performance goals and target results from each project in the implementation plan. Target performance improvements should be linked to specific milestones in the implementation plan to demonstrate that planned projects are linked to target performance gains.

The rough order of magnitude (ROM) total cost or ownership (TCO) estimate outlines the initial projected costs to execute the implementation plan over the program life cycle. The ROM TCO estimate includes the following elements: direct and indirect labor costs (government and contract), and other costs (e.g., facilities, travel, training). A template is provided to the initial projected costs TCO.

Template:

T16 ROM TCO.xls

17 – Decision Paper 2	
Key Question(s):	• Is there a clear linkage between opportunities and meaningful performance gains?
Description:	This paper documents the formal decision point in the segment architecture development process. It summarizes the disposition of segment opportunities and how clear performance gains are tied to the implementation of selected solutions.
Skills Needed:	Program Management and documentation
Considerations:	This document is an executive summary of decisions made in segment architecture development to this point.
File Reference:	T17 Decision Paper 2.doc

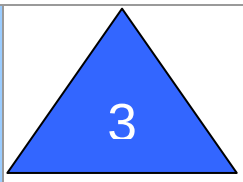
Instructions

Document the background and summary findings for each solution identified. Complete one or many performance improvement tables.

This formal decision paper is intended as a managerial and executive status of the segment architecture development process.

Template:

T17 Decision Paper 2.doc

18 – Opportunity Analysis Report (Part II)	
Key Question(s):	• What are the actual performance improvements to be generated by the solution architecture?
Description:	In Part II of the Opportunity Analysis, performance improvements are quantified and viable are forwarded to the Strategic Alignment Stage. This report provides the results of the Solution Architecture stage. It describes performance gains predicted by each solution architecture.
Skills Needed:	Segment SME, Segment Architecture, analytical skills
Considerations:	Only a portion of this template will be completed during this stage. Part I was completed in Template 9.
File Reference:	T9 Opportunity Analysis Report.doc

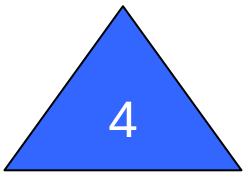
Instructions:

Complete the report began in Template 9. Summarize the performance gains expected by solution. Use the Target Performance Reference Model as input to this work product. Make note of solution architectures that were combined, discontinued, or deemed unreasonable based on detailed findings discovered during the Solution Architecture stage.

Consider each of the notional performance measures created in Part 1. Demonstrate how the solution architecture performance measure will assist in filling performance gaps.

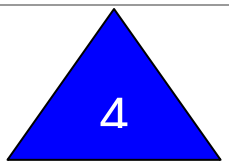
This report forms the basis for logical business case-driven performance improvements.

Template:
T9 Opportunity Analysis Report.doc



Strategic Alignment

The following templates assist in verifying that opportunities can be achieved in a reasonable time frame with available resources, and are in compliance the enterprise vision.

19 – Conceptual Segment Architecture	
Key Question(s):	• How are individual opportunities brought together to create a single segment-level vision?
Description:	This work product provides one or more concept diagrams illustrating how individual opportunity-level architectural work products are brought together to create target segment-level architecture, aligned with agency strategic goals and the enterprise vision. The conceptual segment architecture should display new components and existing components (applications and data stores) included in the target architecture.
Skills Needed:	Visioning, Logical Design (Segment Architecture)
Considerations:	Conceptual segment architecture should be developed at a sufficient level of detail to illustrate the functional nodes in the target segment architecture and the interfaces and relationships between nodes. Individual nodes may be broken down into components (e.g. applications and/or data stores) to support the definition of individual implementation projects.
File Reference:	None

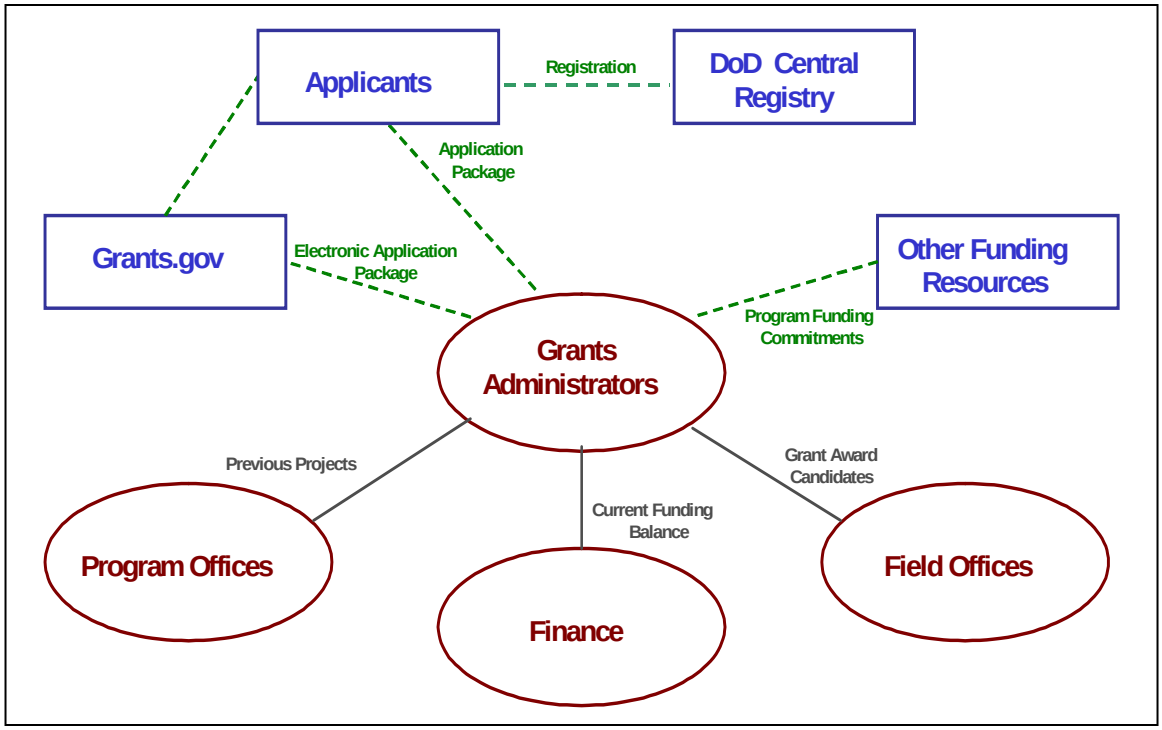
Instructions:

Candidate or "strawman" conceptual segment architecture diagrams should be prepared by a subset of the IPT and reviewed with other members to complete the work product. The "strawman" diagrams should be used to lead IPT working sessions and refine the segment architecture vision to achieve the appropriate level of detail to support subsequent tasks.

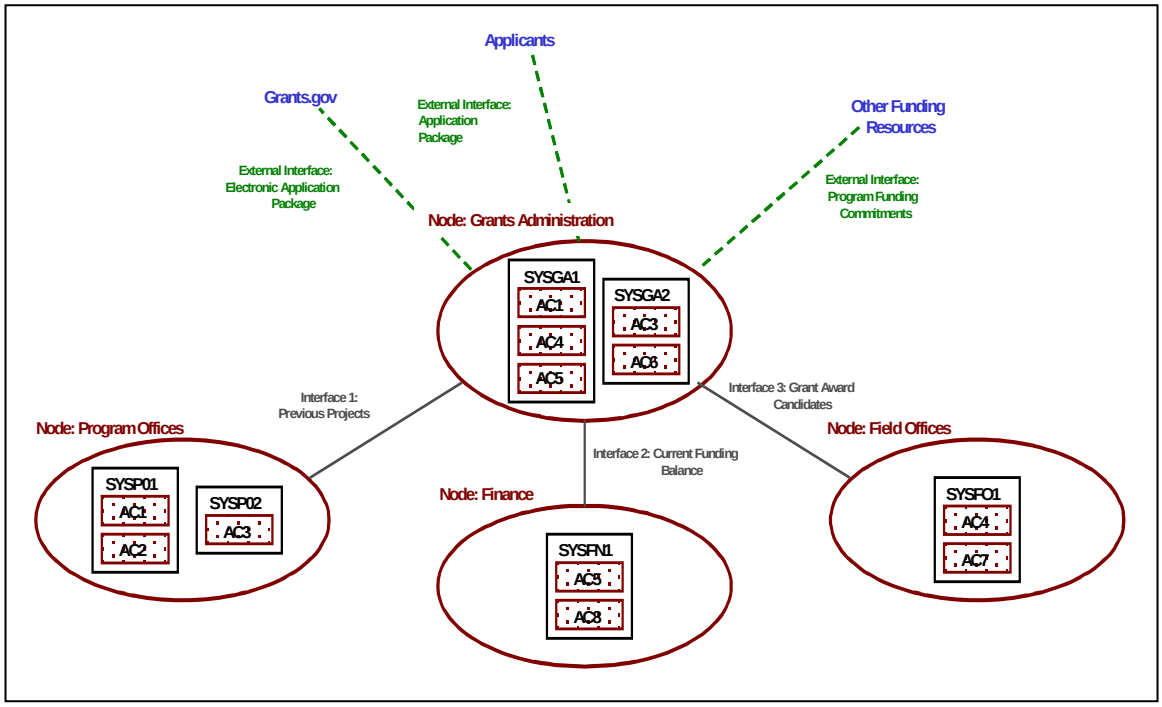
The conceptual segment architecture diagram can include the following elements:

- Core business processes
- Shared data
- Automation technologies and interfaces
- Key stakeholders

Operational view diagrams and system view diagrams (e.g. DoD Operational Framework OV-2, SV-1, and SV-4 diagrams) provide samples of conceptual segment architecture diagrams.



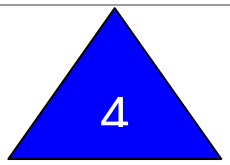
Sample OV-2 Diagram



Sample SV-1 Diagram

Template(s):

None provided.

20 – Strategic Alignment Analysis	
Key Question(s):	• How does the segment-level vision support agency goals and objectives, EA and cross-agency initiatives?
Description:	Strategic alignment analysis verifies that segment-level architecture is aligned with agency strategic goals, agency EA (including the business and IT modernization roadmap – *Vision 2010*), common business and IT services, and relevant cross agency initiatives. Strategic alignment analysis is a key element of segment integration and the definition of relationships between each type of segment – *core mission area, business service, and enterprise service.*
Skills Needed:	Strategic Planner, Enterprise Architect, Business SME
Considerations:	Strategic alignment analysis must be able to demonstrate relationships between the segment level architecture and strategic objectives, and services and initiatives by referencing relevant architectural work products and providing rationale for each assertion.
File Reference:	T20 Strategic Alignment Analysis.xls

Instructions:

Individual opportunities defined by the Opportunities Analysis Report are linked (mapped) to the following elements and reconciled at the segment level:

- Agency strategic goals and objectives (Agency Strategic Plan/Annual Performance Plan)
- Agency EA and business and IT modernization roadmap (Vision 2010) (i.e. business and IT modernization initiatives and enterprise business services)
- Cross-agency initiatives defined by the Federal Transition Framework (FTF)

Alignment with the agency enterprise architecture and business and IT modernization roadmap should identify common or shared business and enterprise services that should be integrated with the segment architecture. Some of the identified HUD common or shared business and enterprise services include:

- Business Services
  - Financial Management
  - Grants Management
  - Direct Loans
  - Business Participant Management
- Enterprise Services
  - Electronic Document and Records Management
  - Decision Support/Business Intelligence
  - Portal
  - Reporting
  - Geospatial Data Management and Analysis
  - Integrated Enterprise Data Management

Strategic alignment analysis identifies the strategic value of the segment architecture in terms of the overarching agency strategy and vision, common services and cross-agency initiatives. Target architecture work products (performance, business, data, services, and technology) should be referenced to demonstrate strategic alignment.

Template:

T20 Strategic Alignment Analysis.xls

21 - Reuse Plan	4
Key Question(s):	• Do opportunities exist to reuse business processes, information assets, services, and technology to achieve target performance gains?
Description:	The reuse plan summarizes overlapping business processes, information assets, service components, and technology requirements and identifies opportunities to reuse business and IT assets. The reuse plan articulates the strategy adopted by segment leadership and identifies where reuse will be exercised to improve performance and gain economies of scale.
Skills Needed:	Segment Architect, knowledgeable stakeholders, IT Systems Engineering
Considerations:	Once the reuse strategy is communicated, funded projects should have performance metrics associated with reuse, and should provide cyclical status against each metric.
File Reference:	T21 Reuse Plan.doc

Instructions:

Review the following data:

- Notional Opportunity Performance Assessment (Template 4)
- Target Concept of Operations (Template 12)
- Target Architecture (Template 13)
- Conceptual Segment Architecture (Template 19)
- Strategic Alignment Analysis (Template 20)

When establishing a reuse strategy, consider organizing each reuse opportunity into one of the following four categories.

- Business Services
- Technology
- Information Assets
- Service Components (not presently addressed in the template)

Each reuse category presents a different set of challenges and may be implemented at different times in a project life cycle. The Reuse Plan template referenced above is organized to address each category separately. A timeline is included in each section to capture reuse implementation dates. The dates need to be transferred to program oversight once projects are funded and operational.

In most cases reuse is implemented over time with some degree of legacy operations running in parallel. Reuse performance gains are best viewed over time. The Reuse Plan should articulate the degree of reuse expected in each category over time.

The following discussion provides a definition of each category and some considerations for completing the template. Not all categories are necessary to include for each reuse plan

Reuse of **business services** includes:

1. Centralizing common services to gain economies of scale. Common services that cross-cut lines of business can be reorganized into centralized service centers specializing in the delivery and customer support of a specific function. Examples of the centralized cross-cutting functions may include reporting services, portal services, or a service to deliver enterprise document and records management. Recommendation to centralize common functions or services should be accompanied by recommendations for organizational change, business area service level agreement identification; business area customer service considerations; and necessary training support.
2. Outsourcing of common business services and enterprise services to reduce cost or refocus staff. Reuse in the context of outsourcing implies reuse at the Federal level. Outsourcing common business services and enterprise services must align with OMB's Federal Transition Framework (FTF).

Technology reuse is grouped into two broad categories:

1. Infrastructure reuse includes the reuse of equipment, network, computers, operating systems, help desks and support.
2. Commercial off-the shelf (COTS) reuse can be applied in several different situations:
    a. Transitioning to a target technology architecture
    b. Leveraging COTS licensing to gaining economies of scale or organizational buying power
    c. Using an existing COTS utility in conjunction with a centralized business service

COTS reuse should be driven by a set of enterprise-level technology standards. See the enterprise Technical Reference Model (TRM) to determine if proposed COTS products are designated as a target technology.

Reusing **information assets:**

Refer to HUD's Segment Data Architecture Development Methodology (March, 2005) for a complete discussion on reuse of information assets associated with this plan.

In accordance with HUD's Data Segment Architecture Methodology (process Step 1.3.4), a Business Data Steward is identified for each Entity Type using the business function CRUD matrix (see methodology). The Business Data Steward in the organization is responsible for the maintenance of the entity type. The Business Data Steward is responsible for:

- Verifying data artifacts are accurate, complete, and compliant with standards
- Ensuring data artifacts are accessible and reused appropriately across the Department
- Ensuring data artifacts are managed as prescribed by HUD EA policies and guidelines

Reuse of information assets requires the designation of Business Data Stewardship. Include the CRUD matrix referenced above in the reuse plan.

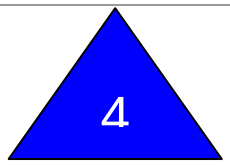
Data Entities may also have cross-organizational and system use. Identify organizational system impacts in the reuse plan; individual project plans will be responsible for maintaining data continuity.

Additionally, for information asset reuse to be effective, Data Quality must be measured and maintained. Using HUD's Data Segment Architecture Methodology as a basis for data quality, discuss how data quality will be maintained to ensure continued and expanded reuse.

In all cases staff may have to be re-trained to gain performance improvements. Include a summary of training requirements associated with the reuse strategy.

Template:

T21 Reuse Plan.doc

22 - Workforce Capabilities Analysis	
Key Question(s):	• Is the current workforce qualified to implement the proposed segment architecture?
Description:	This report is a formal assessment of the agency workforce in relation to segment requirements and proposed solutions.
Skills Needed:	Program Management, Human Resource Development
Considerations:	This analysis reviews available labor categories, capability levels, and demographics. Some data in the Workforce Capabilities Analysis may be proprietary. The Program Manager needs to assemble the IPT members that have access to this information and can summarize the data for general consumption. In the event institutional knowledge has been outsourced, the Workforce Capability Analysis should clearly identify requisite knowledge to implement proposed solutions.
File Reference:	T22 Workforce Capabilities Analysis.doc

Instructions:

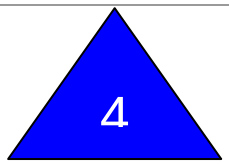
The IPT should analyze workforce capabilities to help determine if proposed implementation strategies are reasonable and to determine the extent performance gains are dependant on the workforce.

The IPT should carefully review the following information when constructing the Workforce Capabilities Analysis Report:

- Opportunity level - Solution Implementation Plans and ROM TCO (Template 16)
- Opportunities Analysis Report - Part II (Template 18)
- Conceptual Segment Architecture (Template 19)
- Reuse Plan (Template 20)

Template:

T22 Workforce Capabilities Analysis.doc

23 – Implementation Plan	

Key Question(s):	• What are the proposed tasks, milestones and schedule for segment architecture implementation?
Description:	A detailed implementation plan to support segment architecture implementation (task, milestones, deliverables) and cost and schedule performance management. The implementation serves as a transition plan for the segment architecture (i.e. a logical sequencing plan to migrate from the current business and information management environment to the target segment architecture).
Skills Needed:	Program/Project Manager
Considerations:	The implementation plan should reflect internal program activities and milestones and external dependencies (i.e., relationships to other segments/programs). Plan elements should be defined at a sufficient level of detail to develop a funding strategy/spend plan to support IT investment (i.e. development of an IT investment business case).
File Reference:	None

Instructions:

The segment architecture implementation plan outlines a transition strategy for one element (program) in the enterprise-wide transition strategy. A single program is aligned with an enterprise segment and comprises multiple individual projects. The following diagram (developed by the OMB Federal Enterprise Architecture Program Management Office) illustrates the relationships between segment architecture, programs, and projects. The segment architecture implementation plan is developed for one program (i.e. a single enterprise segment).

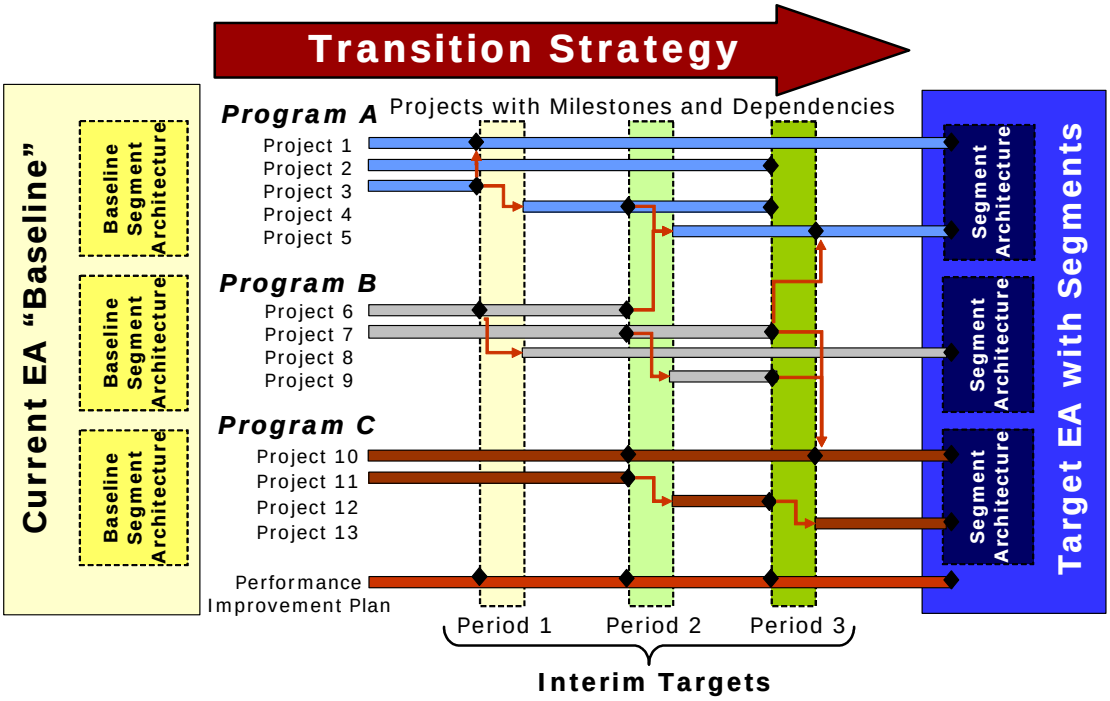


Figure 3-7: Sample Enterprise Implementation Plan

The segment architecture implementation plan is developed using Microsoft Project and in accordance with standard project management guidelines for earned value management (EVM). The implementation plan should also include the following elements:

- **Defined projects**: Individual implementation projects of narrow scope and brief duration. A segment architecture or program comprises multiple individual projects (e.g. solution development and implementation, workforce training).
- **Sequencing plan**: A program (segment-wide) view of individual projects, providing visibility to the sequential rollout of individual elements of the segment architecture. The sequencing plan enables high-level investment planning and supports impact analysis if the projects are modified, cancelled, or delayed.
- **Dependencies**: Maps the dependencies between the program (segment) and other programs and project milestones (including the maintenance and availability of legacy systems and services). Demonstrates program/project integration and allows assessment of impacts if other programs/projects are cancelled or delayed.
- **Contract Acquisition Plan:** Summarizes and schedules contract acquisition actions to support segment architecture development and implementation. The acquisition plan is developed in accordance with agency requirements.
- **Risk Management:** Summarizes strategy and cost estimate to minimize, eliminate, or manage risk associated with segment architecture development and implementation.
- **Performance Improvement Plan**: Summarizes the performance goals and planned results from each project in the implementation plan. The performance improvement plan also provides a consolidated view of performance improvement goals including interim performance goals.

Performance improvement goals should be aligned with the standard performance categories for the development of an IT investment business case (e300) and the definition of the EA transition strategy. OMB Circular A-11 requires that at least one performance measurement indicator is

selected from each one of the four key measurement areas in the Federal Enterprise Architecture (FEA) Performance Reference Model (PRM):

- Mission and Business Results
- Customer Results
- Processes and Activities
- Technology

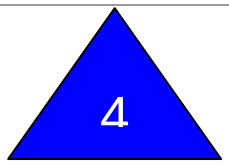
The quarterly EA performance review requires that agencies articulate how the EA Transition Strategy improves performance in the following areas:

- Cost savings
- Cost avoidance
- Improved services to citizens
- Improved mission performance
- Improved management and use of information
- Technology consolidation and standardization

Whenever possible, the segment architecture implementation plan should include concrete milestones linked to performance measures in one or more of the requisite performance improvement categories.

Template:

None provided.

24 - Funding Strategy	
Key Question(s):	• How will these initiatives be funded?
Description:	The funding strategy is a series of strategic and tactical question that assist in re-directing financial resources into efforts that can demonstrate performance improvement.
Skills Needed:	Program Management, ITIM representation, Sr. Management
Considerations:	The funding strategy is impacted by multiple levels of demonstrated performance. Some of the considerations in maintaining and maturing an organization's funding patterns include: past performance, OMB and GAO maturity rankings, congressional focus, maturity of governance and oversight. In the beginning of an implementation, it is essential that "quick wins" are built into the roll-out plan and funding strategy. Longer term gains can be achieved through regular funding cycles. Some aspects of the funding strategy cannot be delegated to contract staff.
File Reference:	None.

Instructions:

Based on the proposed implementation plan, determine the urgency of the investment. For some investments, it may be possible to wait until the funding for the investment is incorporated into the OMB Exhibit 300 business case and approved; and appropriated funds are made available from the Federal Budget. On average this process can take up to two years. It is recommended that the OMB 300 Business Case process be approached in parallel with other funding strategies.

Often there is an urgency to realize performance gains offered by an opportunity. The Funding Strategy should involve available funding resources across the organization, not just the segment. Use the investment analysis questions below to determine what funding can be made available to fund the each phase for the proposed segment modernization effort.

Inputs to the funding strategy may include the examination of the following materials:

- Initial ROM TCO (Template 8)
- Solution Implementation Plan and ROM TCO (Template 16)
- Performance Architecture (Part of Template 13)
- Contract map (Part of Template 13)
- Reuse Plan (Template 21)
- Implementation Plan (Template 23)
- ITIM Investment Portfolio
- Unallocated and/or un-obligated funding report
- IT Master Schedule – review for system and/or Technology Retirements
- TRM – COTS Asset Management Status

Funding Strategy - Investment Analysis questions:

Contracts Analysis:

- Can funding be re-programmed from contracts that will become obsolete as the segment is modernized?
- Can funding be re-programmed from contracts having a lower strategic value to organization?
- Are contracts or option periods terminating that will free financial resources for higher priorities?
- Does the current contract base serve the needs of the segment? Will restructuring contracted services free funding for future initiatives?
- Are contracts utilizing funding appropriately, (e.g. procuring technology with TA funding, procuring business services with Working Capital), and can funds be re-programmed from inappropriate uses?

Systems and Technology Analysis:

- What systems in the enterprise are being retired? What funding is available due to the system retirement?
- Are COTS assets being procured at an enterprise level based on system engineering standards? Does the enterprise support a single point of negotiation for COTS assets? Can funds be freed by re-negotiating COTS license structure to fall in line with solution implementation?
- Can COTS licenses be shared among development groups? Vendors will often allow developer licenses to be shared or even given away to gain a foothold as a standard enterprise product.
- Are technologies being retired as part of the organization's efforts to move to standard reusable technologies? Are funds becoming available?
- Are systems being consolidated freeing Operations and Maintenance funding?
- Are systems being outsourced to gain economies of scale and freeing finding?

Business and Process Analysis:

- Will business processes change significantly enough to fund modernization based on reduced cycle times, increased participation fees, reduced infrastructure, or software?
- Will internal business staffing (Full Time Equivalent) needs change based on changing or streamlining business process?
- Can business functions be eliminated or automated as a result of the modernization efforts?
- Can business functions be consolidated into service centers, effectively centralizing common services and reducing support costs?

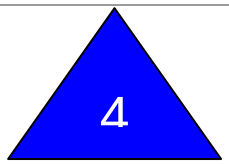
Financial Analysis:

- What level of prior year funding is available in the organization? Are business areas delivering on performance plans? Consider re-programming unutilized prior year funding from business areas with a track record of unacceptable performance.
- Are budgetary spend plans being under run?
- Are unallocated or un-obligated funds available to re-program?
- Are transfer funds available from other funding sources that can be re-programmed?

Construct a funding plan covering multiple fiscal years using the results of the analysis above. Note: Funding analysis may result in changes to the implementation plan.

Template:

None provided.

25 – Segment Architecture Work Product Outline	
Key Question(s):	• How should the final segment architecture work product be packaged?
Description:	Provides a section-by-section outline for the preparation of the segment architecture work product.
Skills Needed:	Program Manager, Business/Technical Writer
Considerations:	Segment architecture documentation and back-up materials (solution architecture) are submitted to the EA practice for review and approval, and reconciliation with enterprise architecture.
File Reference:	Template-25 segment arch work product outline.doc

Instructions:

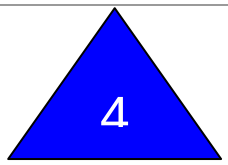
The segment architecture work product outline reflects the major segment-level stages:

- Stage 1: Opportunity Analysis
- Stage 2: Opportunity Prioritization
- Stage 4: Strategic Alignment Stage
- Stage 5: Program Management Stage

Each section of the segment architecture work product presents information developed during each segment-level stage, defining performance improvement opportunities, implementation priorities, conceptual architecture, and a segment implementation plan. The content of specific individual architectural work products developed during each segment-level stage may be provided as part of the back-up materials in the segment architecture appendices. Information developed during Stage 3 (Solution Architecture) is also provided as back-up information.

Template:

T25 Segment Arch Work Product Outline.doc

26 – Decision Paper 3	
Key Question(s):	• Can solutions be implemented in a reasonable time frame with available resources and in compliance with the enterprise vision?
Description:	This paper documents a decision point in the segment architecture development process. It summarizes the disposition of proposed segment solutions and recommends segment level projects to be implemented.
Skills Needed:	Program Management, Writer
Considerations:	This document is an executive summary of decisions made in segment architecture development during the Strategic Alignment stage.
File Reference:	T26 Decision Paper 3.doc

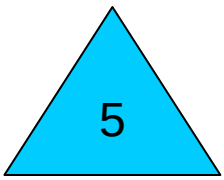
Instructions

Document the background and summary findings. For each solution recommended, document the expected time frame for implementation, resource dependencies, and alignment with the enterprise vision.

This formal decision paper is intended as a managerial and executive status of the segment architecture development process.

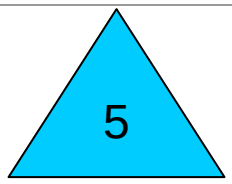
Template:

T26 Decision Paper 3.doc



Program Management

The following templates assist in developing an executable program management plan tied to enterprise performance measures and controls. The program management plan defines funded projects executed at the opportunity level.

27 – Program Management Plan	
Key Question(s):	• What are the individual projects, milestones, and internal and external dependencies? • What are the resource requirements and contract/acquisition requirements?
Description:	A detailed, executable program plan to support segment architecture implementation (task, milestones, deliverables) and cost and schedule performance management. The Program Management Plan serves as a transition plan for the segment architecture (i.e. a logical sequencing plan to migrate from the current business and information management environment to the target segment architecture).
Skills Needed:	Program/Project Manager
Considerations:	The Program Management Plan should reflect internal program activities and milestones and external dependencies (i.e. relationships to other segments/programs). *Plan elements should be defined at a sufficient level of detail to support program management and hand-off to project managers*.
File Reference:	None

Instructions:

The Program Management Plan outlines a transition strategy for one element (program) in the enterprise-wide transition strategy. A single program is aligned with an enterprise segment and comprises multiple individual projects. The following diagram (developed by the OMB Federal Enterprise Architecture Program Management Office) illustrates the relationships between segment architecture, programs, and projects. The segment architecture implementation plan is developed for one program (i.e. a single enterprise segment).

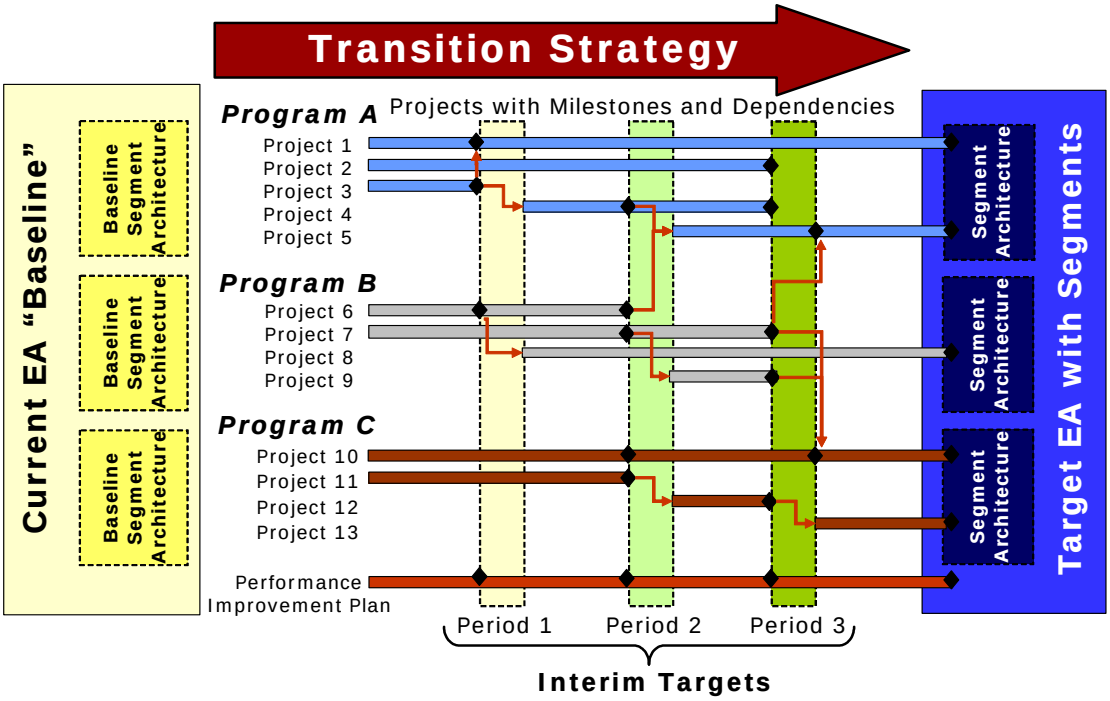


Figure 3-8: Sample Enterprise Implementation Plan

The program management plan is developed using Microsoft Project and in accordance with standard project management guidelines for EVM. The Program Management Plan absorbs the segment architecture implementation plan (developed during the Strategic Alignment stage) and adds elements to support all facets of segment development and implementation. The program management plan contains the following content:

- **Defined projects**: Individual implementation projects of narrow scope and brief duration. A segment architecture or program comprises multiple individual projects (e.g. solution development and implementation, workforce training).
- **Sequencing plan**: A program (segment-wide) view of individual projects, providing visibility to the sequential rollout of individual elements of the segment architecture. The sequencing plan enables high-level investment planning and supports impact analysis if the projects are modified, cancelled, or delayed.
- **Dependencies**: Maps the dependencies between the program (segment) and other programs and project milestones (including the maintenance and availability of legacy systems and services). Demonstrates program/project integration and allows assessment of impacts if other programs/projects are cancelled or delayed.
- **Contract Acquisition Plan:** Summarizes and schedules contract acquisition actions to support segment architecture development and implementation. The acquisition plan is developed in accordance with agency requirements.
- **Risk Management:** Summarizes strategy and cost estimate to minimize, eliminate, or manage risk associated with segment architecture development and implementation.
- **Performance Improvement Plan**: Summarizes the performance goals and planned results from each project in the implementation plan. The performance improvement plan also provides a consolidated view of performance improvement goals, including interim performance goals.

Performance improvement goals should be aligned with the standard performance categories for the development of an IT investment business case (e300) and the definition of the EA transition strategy. OMB Circular A-11 requires that at least one performance measurement indicator is selected from each one of the four key measurement areas in the Federal Enterprise Architecture (FEA) Performance Reference Model (PRM):

- Mission and Business Results
- Customer Results
- Processes and Activities
- Technology

The quarterly EA performance review requires that agencies must articulate how the EA Transition Strategy improves performance in the following areas:

- Cost savings
- Cost avoidance
- Improved services to citizens
- Improved mission performance
- Improved management and use of information
- Technology consolidation and standardization

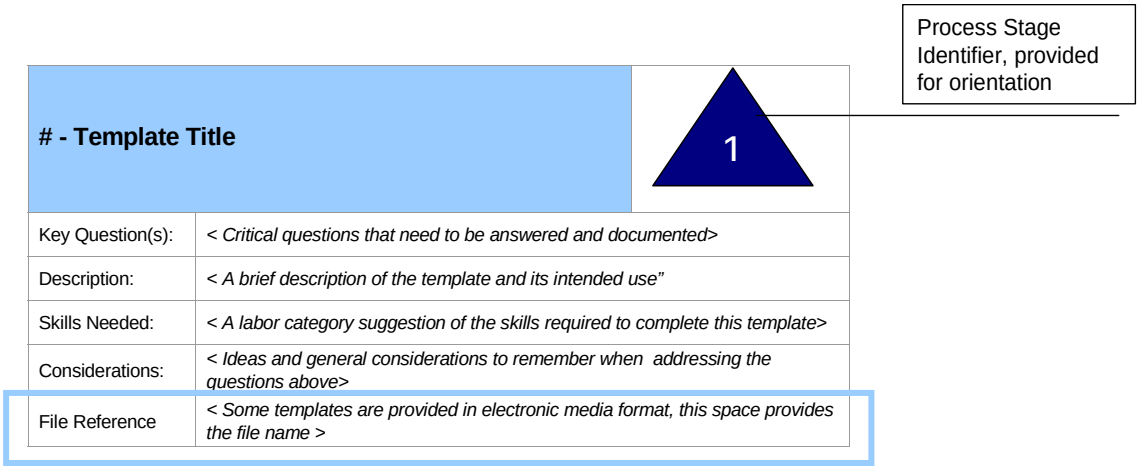
Whenever possible, the program management plan should include concrete milestones linked to performance measures in one or more of the requisite performance improvement categories. *A subset of the program management plan milestones is selected and is provided to track progress toward implementation of the EA transition strategy in the IT Master Schedule.*

Template:

None provided.

4 Reference Materials

The CD included with this guidance, contains work product templates (files) identified in the File Reference element of the work product template stamp in Section 3.



# - Template Title	
Key Question(s):	*< Critical questions that need to be answered and documented>*
Description:	*< A brief description of the template and its intended use"*
Skills Needed:	*< A labor category suggestion of the skills required to complete this template>*
Considerations:	*< Ideas and general considerations to remember when addressing the questions above>*
File Reference	*< Some templates are provided in electronic media format, this space provides the file name >*