

APPENDIX C

Framework Elements

Appendix C - Framework Elements

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C.1 Architecture Management

A key component of the SFA modernization plan is the development of the Modernization Blueprint. This Blueprint will define the target architecture for SFA including business requirements, functional and technical architectures, as well as a sequencing plan to implement the target architecture.

The four levels of the Modernization Blueprint are presented in Figure C-1 below and in the paragraphs that follow.

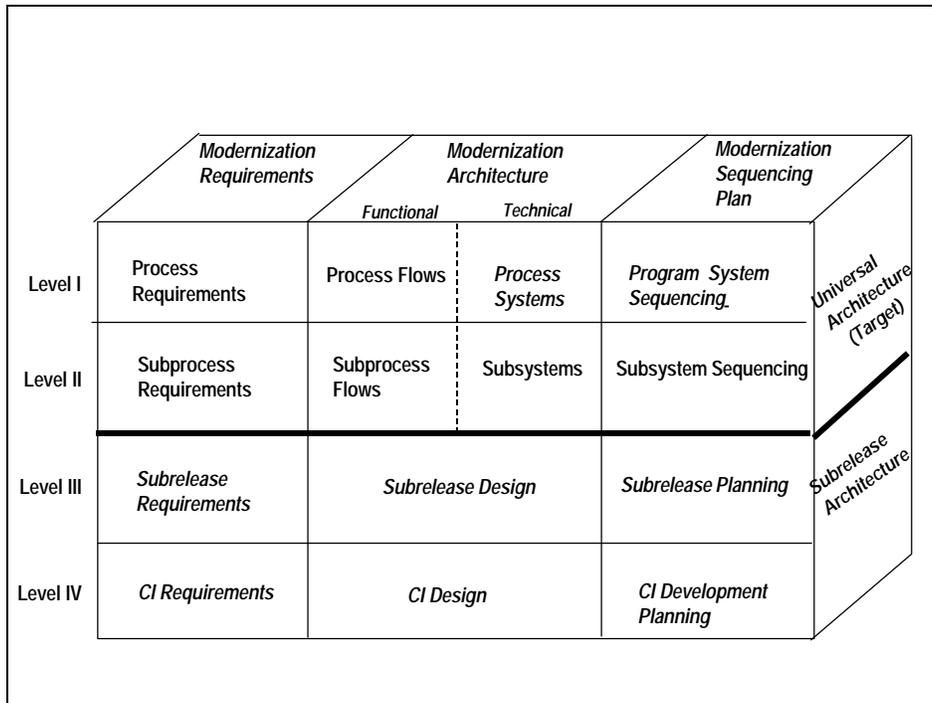


Figure C-1: SFA Modernization Blueprint

Level I

- **Business Requirements** - the major business requirements of the SFA mission are identified and organized into processes. Business requirements drive the functional and technical architectures in addition to the sequencing plan.
- **Functional Architecture** - the main business functions performed by SFA are identified as processes. Relationships between and among processes and requirements describing process capabilities are identified.
- **Technical Architecture** - illustrates and describes relationships between and among Program Systems.

- **Sequencing Plan** - within the context of the functional and technical architectures, as driven by the process requirements, the sequencing plan lays out the steps for introducing new program systems.

Level II

- **Business Requirements** - the major business requirements of the SFA mission are organized and broken down into business requirements identified within a set of subprocesses.
- **Functional Architecture** - subprocesses are identified within each functional area based on groupings of related requirements. The Blueprint illustrates and describes the functionality, relationships, and process flows between and among subprocesses. Requirements describe the core business functions to be performed by SFA.
- **Technical Architecture** - illustrates and describes the functionality and relationships between and among subsystems. Subprocesses relate to subsystems many-to-one.
- **Subsystem Sequencing** - identifies steps for introducing new subsystems that implement subprocess requirements according to the associated functional and technical architectures.

Level III

- **Functional and Technical** - definitions of a subrelease and its elements are organized to reflect subrelease build strategy, detailed requirements decomposed and allocated to build units (also called Configuration Items (CIs)).

Level IV

- **CI Element Design** - including software design at the Configuration Software Unit (CSU) level.

Of the elements within the framework, architecture management is applied to Levels I and II, labeled the Universal Architecture. The Universal Architecture is also called the Target Architecture.

Draft and final releases of the SFA Blueprint are planned for June 30, 1999 and September 30, 1999 respectively.

Architecture management serves to keep the elements of the modernization architecture up-to-date, aligned with the process and subprocess requirements, and linked into the program and subsystem implementations. The following subsections describe the organization and processes for maintaining the Blueprint.

The architecture management process for SFA is presented in the following subsections:

- Subsection C.1.1 Introduction
- Subsection C.1.2 Assumptions
- Subsection C.1.3 Architecture Management, Processes, and Organization
- Subsection C.1.4 Charter Examples

C.1.1 Introduction

An IT architecture keeps its value through the process of architecture management. Architecture management ensures that the components of the architecture remain current and aligned with changing business and technology requirements. This section presents the activities and supporting organizational structures of architecture management.

The architecture management process manages and updates the documents used to record and communicate the architecture principles and standards. Changes to the information may occur because changes in business strategy and available IT. The information is maintained and communicated through narrative and models.

The organization supporting architecture management fulfils a critical role: it ensures that the processes of architecture management actually happen. The architecture management organization keeps the enterprise architecture vital: it tracks industry trends, updates architecture material, and is there to answer questions about the architecture.

C.1.2 Assumptions

For reference purposes, the following list of assumptions affected the design of the architecture management process:

- The staffing model is based on requirements described by ED (personal communication) in November of 1998. *SFA*, under their new designation as a PBO, will likely develop new staffing requirements, and the staffing can be adjusted to accommodate the new requirements.
- ED and Contractor staff with appropriate skills and knowledge must be available to the architecture management effort as necessary to provide timely, high-quality information in order to support deliverables, products, plans, and decisions.

C.1.3 Architecture Management Processes and Organization

This subsection presents the key components of *SFA*'s Architecture Management: processes and organizational structures:

- Subsection C.1.3.1 Architecture Management Organization
- Subsection C.1.3.2 Architecture Management. Processes
- Subsection C.1.3.3 Change Management

C.1.3.1 Architecture Management Organization

Without an accountable organization, architecture management will not succeed. The organization ensures that the range of activities supporting architecture management actually happen (e.g., that documents are reviewed and updated, technologies are systematically tracked, and architectural principles are regularly reviewed and updated). This subsection presents an organization responsible for architecture management processes and procedures within *SFA*. The organization provides *SFA* with a presence that represents the enterprise architecture. The organization communicates architecture matters, it interprets the architecture to best advantage of *SFA*, and it ensures that what is learned about architecture benefits *SFA*.

Figure C-2 depicts the structure of the architecture management organization. It consists of two primary groups: one for decision-making and oversight, the second for conduct of the supporting tasks. The Architecture Management Board (AMB) is responsible for making decisions concerning the *SFA* enterprise architecture. It is responsible for keeping the architecture up to date, relevant, and ensuring that it is applied to *SFA* IT projects. Director PSS serves as manager of the AMB.

The Architecture Working Group (AWG) performs the day to day work required by the AMB. They perform tasks including research, studies, analyses, and evaluations of new technologies. The AWG communicates with users to assist with the interpretation and application of the architecture. Director TPAS serves as manager of the AWG.

The architecture management organization interacts with the *SFA* groups responsible for investment management and configuration management. The IRB and its supporting group, the DSG, manage the portfolio of IT development projects. The AMB makes requests of the IRB for architecture project approval, prioritization, and funding. The IRB makes requests of the AMB for architecture management and progress information.

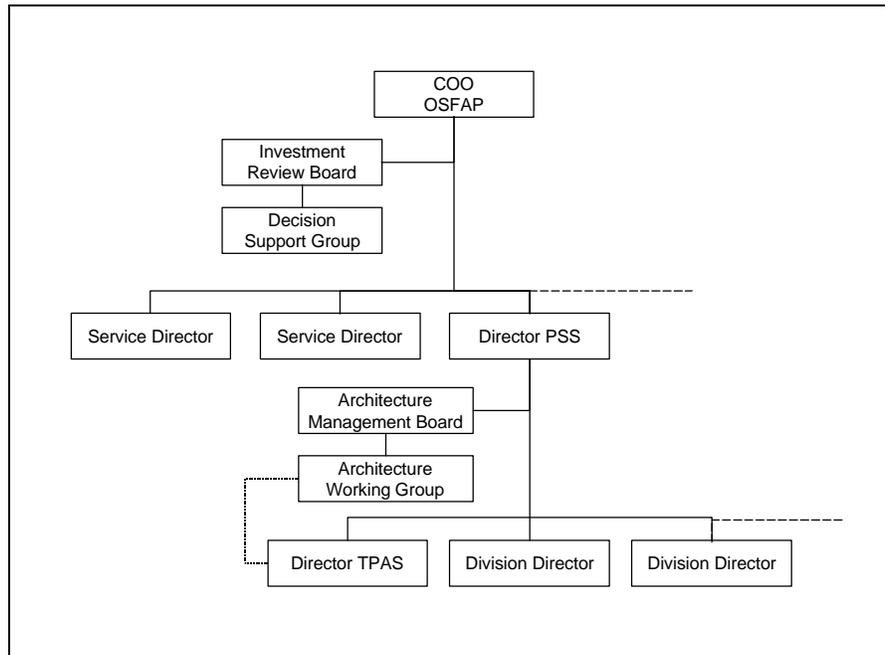


Figure C- 2: Architecture Management Organization

Architecture Management Board

The AMB coordinates and directs the process of architecture management. It is responsible for detecting and analyzing changes in *SFA* business and technology environments, for evaluating proposals for changes, and deciding what changes will be included in the architecture. The AMB is the decision-making body for the *SFA* IT architecture.

The AMB consists of PSS Division Directors. While the AMB is under the leadership of the PSS Director, the responsibility of chairing the AMB may be delegated to Director TPAS. The AMB is primarily a strategy and decision-making body, with staff support provided by the AWG. At

the end of this section, see Example Document 1 for an example of a Charter for the Architecture Management Board.

Architecture Working Group

The AMB tasks most of its work to the AWG. As the “go to” group for the AMB, the AWG conducts research, studies, analyses, and evaluations of new technologies. AWG members participate in technical and SFA conferences as well as interacting directly with members of IT implementation projects and external users of the enterprise architecture. Members serve as change agents within their larger community. They are change agents because they are promoters of the use and value of the enterprise architecture where it may have received little attention previously.

As a support group to the AMB, the AWG accepts tasking from and reports back to the AMB. The AWG consists of *SFA* employees managed by the Director of TPAS. PSS employees and contractors brought in on either a full-time or part-time basis may supplement the skills of the core group. These *virtual team* members provide expertise, skills, and knowledge to the core AWG. Core group members should be assigned full-time because architecture is a key element in the *SFA* strategy. Full-time staff is required to sustain the level of effort required for architecture management and to preserve architecture knowledge and experience within *SFA*. At the end of this section, see Example Document 2 for an example of a Charter for the Architecture Working Group.

Effective members of the AWG will have the following capabilities:

- To be credible within the *SFA* community, they must have experience with IT implementation projects on a scale comparable with those of *SFA*.
- To conduct studies and analyses, they must have demonstrated analytical skills.
- To convey their work to others, they must possess the ability to communicate clearly in both spoken and written forms.
- To be effective change agents, they must be able to build consensus and facilitate collaboration among diverse technical and business interests within *SFA*.

The skills required by the AWG may be developed through a combination of training and mentoring. Candidates develop their knowledge of enterprise architecture by working with senior ED staff and contractor project teams. Candidates develop their abilities as communicator and change agents by working closely with role models.

Table C-1 depicts three possible staffing levels for the AWG, with associated tasks, benefits, and risks noted.

Option	Team Size	Primary Tasks	Benefits, Risks
Full Up	6+ full time	<ul style="list-style-type: none"> • serve as expert resource • participate in strategy and planning • maintain architecture • oversee architecture of implementation projects • direct the renovation of infrastructure 	<ul style="list-style-type: none"> • high impact • difficult to staff due to skills required • may be seen as elite • staff transitions have limited impact
Midsized	3-5 full time, supplemented by virtual team members	<ul style="list-style-type: none"> • serve as expert resource • maintain architecture 	<ul style="list-style-type: none"> • oversight performed indirectly • reliance upon virtual team members • reliance upon contractors • staff transitions have moderate impact
Bare Bones	2-3 full time, supplemented by virtual team members and contractors	<ul style="list-style-type: none"> • serve as expert resource • maintain architecture 	<ul style="list-style-type: none"> • limited impact • can oversee only a small number of architecture management projects • staff transitions have severe impact • heavy reliance upon contractors • heavy reliance upon virtual members

Table C-1: Architecture Working Group Staffing

Skills and Training

High performance groups train as they are reinventing, so the AMB and AWG training and staff development should be included in their startup activities. Suggested training and skills for the staff of the two groups is included in the following paragraphs.

Architecture Management Board

Members of the AMB are experts in the work of their respective Divisions, and they are not required to be as technical as their AWG counterparts. The basic architecture training of Board members should embrace the following areas:

- Enterprise architecture principles, standards, best practices, and emerging trends within government and industry.
- Architecture designs to include hardware, software, and communications for supporting an enterprise.
- Architecture views (e.g., IEEE P1471) and frameworks (e.g., Zachman).
- Architecture development methodology.

Depending as it does upon promoting positive change within *SFA*, the AMB member's most important skill is communication: the ability to speak succinctly, write clearly, and listen well.

Architecture Working Group

Serving as technical support for the AMB, the AWG staff should possess the following training and skills:

Training should focus in the areas of:

- Enterprise architecture principles, standards, best practices, and emerging architecture trends within government and industry.
- Architecture designs; to include hardware, software, and communications for supporting an enterprise.
- Architecture views (e.g., IEEE P1471) and frameworks (e.g., Zachman).
- Architecture development methodology.
- Introducing new concepts, processes and technologies into an organization.
- Systems integration and software development.
- Component-based software design and development.

Skills for AWG members should primarily include:

- Enterprise analysis techniques, including modeling and simulation, and the use of associated tools.
- Project management.
- Software development, including object and/or web development.

The manager of the AWG adds a broad awareness of architecture design and development trends in government and industry as well as strong leadership skills; including communication, team building, and facilitation.

C.1.3.2 Architecture Management Processes

The activities of Architecture Management are organized into the following four major processes and described in the following subsections:

- Development
- Administration
- Assessment
- Maintenance

Each of these processes is described in turn in the following subsections.

Development

Development of an enterprise IT architecture is performed in these stages:

1. Organize and Initiate Project
2. Document Baseline Architecture
3. Establish Target Architecture
4. Develop Transition Strategy and Plan
5. Implement Organizational Change
6. Implement Transition
7. Administer and Maintain Architecture

In the formation of the Modernization Blueprint, SFA has completed through step four in establishing the Target Architecture. The SFA Modernization Blueprint serves this purpose.

Administration

ED managers are committed to the implementation of the Modernization Blueprint vision in their information systems. Realizing this vision requires a strong connection between the results of the planning process, the Blueprint, and the implementation of the plans for IT projects. Architecture administration by the SFA architecture organization makes this connection. Each of the following subsections describes one of these key blueprint administration activities.

- Project Proposal Assistance
- Architecture Outreach
- RFP Support
- System Development Life Cycle Support

Project Proposal Assistance

Assisting with project proposals is a function of the AWG. The AWG collaborates with project proposal teams at two key points: 1) as the project proposals are being formed and 2) when a proposal has been submitted for IT funding.

Project proposals are the result of the ideas of interested persons within the ED and SFA communities. Through dialog with business process sponsors and the IT service, the ideas are built up into project proposals with a complete technical and business case. By calling upon the resources of the AWG, proposal sponsors have a source of technical advice and coaching that strengthens technical credibility and improves the chances that a project proposal will be adopted.

The AWG conducts technical reviews of project proposals as requested within the change management process. The Change Management Board or the IRB will submit requests during the CM process. The AWG reviews the proposal for technical soundness, analyze for technical impact, and assess the technical value to SFA. When a proposal has an impact on the Blueprint, the AWG is responsible for evaluating the impact, determining the changes required to the Blueprint, assessing the cost and impact of the changes, and recommending any action on the Blueprint changes. A description of these changes to the Blueprint becomes part of the project proposal. When the proposal is reviewed by the IMB, the project impact on the Blueprint can be evaluated along with the merits of the proposal itself.

Architecture Outreach

Project planners look to the architecture team for the information they need about the Modernization Blueprint. The AWG helps drive the Blueprint vision into implementation projects by ensuring that business and IT organizations, contractors, and the SFA community understand and utilize the architecture. An architecture is more than words and pictures; it is embodied in people of vision who have the desire to inspire others.

Project planners receive, define, and refine the ideas that become project proposals within SFA. Supporting early designs requires the AWG to teach project planners the essential points of the Blueprint. To serve this purpose, the AWG will perform the functions listed below.

- Convey the purpose and goals of the Blueprint.
- Impart the fundamental design decisions and supporting rationale.

- Explain the tools, technologies, and methodologies that support the development and administration of the Blueprint.
- Coach proposal and project planners through the documents, models, and supporting material that forms the Blueprint.
- Gather, organize, and communicate lessons learned.

The AWG may use any of the following means to communicate the Blueprint architecture.

- Conduct training classes.
- Hold informal “brown bag” seminars.
- Maintain and publicize an intranet site.
- Participate in architecture projects within the SFA community at large.
- Contribute to conferences on student financial assistance.
- Submit papers to and speak at technical conferences.
- Support project development efforts from proposal development through implementation.

RFP Support

As part of the AWG architecture administration, support for RFPs ensures that the Blueprint vision is consistent throughout the procurement life cycle.

- Assist project planners with structure and content of an RFP so that the Blueprint requirements are properly conveyed.
- Review and comment on an RFP prepared by the project planners.
- Evaluate and comment on the vendor responses to the RFP.
- Serve as needed on the evaluation committee.
- Gather, organize, and communicate lessons learned.

System Development Life Cycle Support

In order to ensure that implementation projects align with the Blueprint from design through implementation, the AWG engages with project teams. AWG provides a range of services for each phase of the system development life cycle for a new project as listed below.

Plan - Project Startup

- Identify required capabilities of AWG staff supporting Blueprint implementations.
- Assign AWG staff to project.
- Guide project planners in initiating project.
- Participate in project initiation meetings.
- Conduct architecture Blueprint workshops for project leaders and team members.

Analysis, Design, and Build Phases

- Confirm that analysis and design deliverables reflect architecture standards.
- Respond to and resolve SFA Blueprint standards issues or conflicts.
- Coordinate architecture standards inquiries and issues with across active projects, the SFA baseline and Blueprint target architecture.
- Collaborate with projects to refine and evolve architecture standards that may lead to temporary architecture “workarounds” or Blueprint architecture change requests.

- Assemble, organize, and communicate Blueprint lessons learned.

Test and Roll Out Phases

- Confirm that the test system reflects Blueprint architecture standards.
- Confirm that the newly implemented system reflects Blueprint architecture standards.

Assessment

Assessment provides a periodic review of an architecture by reviewing the implementation of that architecture through systems projects. Architecture assessment determines whether the implemented projects comply with the architecture, whether the architecture is returning the value anticipated to SFA, and how the architecture may have helped or hindered implementation of systems capability. In this way, architecture management contributes to the Evolution phase of the ED/SLCDM.

The AMB uses the results of an assessment to identify proposed architecture changes as well as assess which changes could result in changes to the systems capability. In addition, the assessment can discover and assess information technologies that may enhance the overall architecture capabilities in terms of meeting business objectives.

An assessment review is performed within three to twelve months after the Roll Out stage of a systems implementation project. Ideally, the first assessment review is conducted before the implementation team disbands. Additional periodic reviews of the implementation of systems capability are performed as recommended by the AMB (see subsection C.1.3.1 for discussion regarding the AMB). The activities performed during assessment are described in the following subsections:

- Organize and Initiate Project Participation
- Observe Operation of Implemented System
- Document Required System Changes

Organize and Initiate Project Participation

During the Roll Out stage of a systems capability implementation project, a team is assembled that is responsible for performing the periodic assessments of the systems capability and the architecture. The assessment team consists of members of the AWG, supplemented by SFA staff possessing appropriate technical and subject matter expertise. A member of the AWG manages the assessment project. A contractor may conduct the assessment if SFA requires an independent review.

The initial work of the assessment team is to develop an understanding of project documentation and to conduct knowledge-gathering sessions with key project team members. Ideally, this work is done prior to the disbanding of the project team. The documentation reviews and interviews provide the initial basis of understanding about the implemented software capability. During the information gathering process, a primary focus of understanding is information regarding implementation decisions that impact the architecture in both positively and negatively. The gathered information and its subsequent updates during the observation process are the beginning point for subsequent reviews.

Observe Operation of Implemented System

For each project under study, the established systems capability configuration is evaluated against the architecture and gaps or discrepancies are noted. The process requires collaboration among the team responsible for the ongoing system operation and maintenance, the assessment team, and project stakeholders. Key questions to be addressed by the joint team include:

- Is the architecture still valid?
- Should any architecture principles be changed?
- What are the reasons for considering a change?
- How will changes benefit the organization?
- Are the IT standards driven by this project appearing in the organization? If the standards are appearing gradually, specify how far the transition has occurred and what the payoff of the transition has been?
- Have any standards become less attractive during the implementation?
- Have any anticipated standards failed to become available?
- What expected benefits have been realized from implementing the architecture?
- What unanticipated benefits have been realized from the architecture?
- What lessons have been learned about the architecture?

This material constitutes the Architecture Assessment Report (AAR) for SFA. This report is made available to interested SFA managers, staff, stakeholders, and the IRB. While the AMB is responsible for preparing the AAR, the work will generally be assigned to the AWG. When an independent assessment is required, the AMB can task the AWG to engage an outside consulting team.

Any issues presented in the AAR should be addressed through (1) technical review performed by the AMB, (2) business review performed by the Service Directors, and (3) investment review performed by the IRB. These reviews may generate changes to the architecture or systems; for this purpose, the business sponsor of these changes uses the CM process.

Figure C-3 presents a sample table of contents for an AAR.

Architecture Assessment Report	
Table of Contents	
I.	Executive Summary
-	Project Name
-	Key Issues
II.	Scope of Architecture Assessment
III.	Key Findings
IV.	Implementation Adherence to Architecture Principles and Target Architecture
-	Processes
-	Information
-	Technology
-	Standards
-	Migration Issues
-	Architecture Organization and Personnel Issues
V.	User Views of Benefits and Functionality Delivered
VI.	Review of Cost/Benefit Implementation Delivered
VII.	Continuous Process Improvement Recommendations
VIII.	Lessons Learned
IX.	Next Steps
Source: TAFIM	

Figure C-3: Table of Contents for an AAR

Document Required System Changes

While performing an assessment of implemented systems capability, the assessment team may identify possible system changes. In addition to noting these proposed changes in the AAR, the assessment team prepares a change request for each noted change. The change requests are categorized as either architecture or systems capability changes.

Architecture change requests address changes that could be made to the architecture to provide system-wide processing and performance enhancements, thus ensuring that the architecture is returning the value anticipated to SFA.

Systems capability changes address technology changes that could be made to the systems to enhance its processing and performance. Technology changes include the implementation of both information technologies currently supported by the architecture and those technologies through changes to architecture principles and standards. The assessment team can refer functional changes to business sponsors who are ultimately responsible for proposing these changes to systems. Change requests prepared by the assessment team are submitted for review and approval through the SFA CM process.

Maintenance

This subsection presents processes for maintaining the SFA Blueprint. Maintenance is organized around key elements of the Blueprint.

Process for Reviewing and Updating the Blueprint Architecture Principles

The SFA architecture principles are defined in the *SFA EITAF: Business Drivers and Architecture Principles* (October 1998). Resulting from the review and update are a list of changes to the Blueprint architecture principles, submitted to the change management process for inclusion in the formal SFA documentation. Responding to these changes, the manager of the AWG initiates reviews of Blueprint business processes, subprocesses, and technology. Through these reviews the changes to the architecture principles are propagated through the Blueprint architecture.

The manager of the AWG will initiate a review of the Blueprint architecture principles not more than 5 years from the date of this publication, or when there is sufficient change in the SFA leadership and overall ED goals and direction. The review shall be performed in conjunction with the AWG by a group of SFA managers drawn from appropriate levels of the organization. To accomplish this review, the following steps shall be taken:

1. **Review Strategic Drivers** - strategic drivers are the most fundamental issues that an organization is facing. The organization's response to them is embodied in its highest level goals and mission statement. These drivers, and the resulting high-level goals, should be reviewed. The SFA strategic plan and PBO charter are sources of information for this analysis.
2. **Review SFA Objectives and Goals** - the objectives and goals of SFA define its vision of the future, and the measurable steps to be taken to achieve that future. They are driven from the high level goals defined for ED and SFA and documented in the SFA strategic plan and PBO charter.
3. **Review Existing Principles** - existing architecture principles should be reviewed to see if they address SFA strategic drivers and confirm that they still support the objectives and goals of SFA.
4. **Recommend Changes** - where appropriate, recommend additions, modifications, or deletions of architecture principles. Recommendations for changes should be coordinated with individual managers within ED and SFA to ensure that any recommendations reflect their cumulative wisdom.
5. **Update Architecture Principles** - changes to the architecture principles documents shall be made in accordance with the SFA configuration management procedures.

Process for Reviewing and Updating the Blueprint Business Processes

The Blueprint business processes describe the basic functional flows that make up the SFA business. These are defined by presenting high-level business areas, processes within those business areas, and a set of tables cross-referencing processes to both user classes and work locations. The business processes are further documented through a list of requirements and a set of models. Changes made to the underlying process areas should reflect back to the requirements and models.

The product of the reviewing and updating steps is a list of proposed changes to the business process documents supporting the Blueprint along with supporting rationale. Changes to the Blueprint business processes will be published to interested persons within SFA, in the SFA and ED communities as well as to the supporting contractors. Individual project teams should choose

to act upon these changes by proposing modifications to their architectures. SFA CM receives these proposals and begins the process of implementation.

The manager of the AWG will initiate a review of business processes and requirements when there is significant change to the content. The review shall be performed in conjunction with the AWG and a group of SFA managers, drawn from appropriate parts of the organization. To accomplish this review, the following steps shall be taken:

- 1. Review Proposed Changes to Business Processes** - a review should be made of the proposed changes to the business processes. The review should consider:
 - The definitions of the business areas. Ensure that the business area definitions continue to meet the needs of SFA.
 - The business requirements. Ensure that the proposed business processes would reflect the business requirements of SFA.
 - The definitions of user classes and their relationship to business processes. Ensure that the user class definitions continue to meet the needs of SFA.
 - The definitions of work locations and their relationship to business processes. Ensure that the work location definitions continue to meet the needs of SFA.
- 2. Review Current Business Processes** - the current business processes are examined in light of the proposed changes to determine whether changes should be made. Consider changes to the underlying business requirements.
- 3. Recommend changes** - where appropriate, recommend additions, modification, or deletions to the Blueprint document and supporting models. Recommendations for change should be coordinated with individual managers within SFA to ensure that any recommendations reflect their cumulative wisdom. Changes should be mapped to the existing subprocesses. If new subprocesses must be defined, these should be changed as described in the next subsection.
- 4. Update Models and Documents** -submit requests for the inclusion of changes to the effected documents and models. Requests shall be processed in accordance with the SFA configuration management guidelines.

Process for Reviewing and Updating the Blueprint Subprocesses

The Blueprint business subprocesses define a set of models and documents that combine to deliver the Blueprint business processes. The manager of the AWG responds to changes in the subprocesses by initiating a review of these functional elements.

The product of this activity is a list of proposed changes to the subprocess documents supporting the Blueprint along with supporting rationale. Changes to the Blueprint architecture will be published to interested persons within SFA, the SFA and ED communities, and supporting contractors. Individual project teams should choose to act upon these changes by proposing modifications to their architectures. SFA Change Management begins the process of implementing these proposals.

The Blueprint subprocess review shall be performed jointly by the AWG and a group of SFA managers drawn from appropriate parts of the organization. To accomplish this review, the following steps shall be taken:

1. **Review Proposed Changes to Business Subprocesses** - a review should be made of the proposed changes to the business subprocesses. The review should consider:
 - Grouping of subprocesses into processes. If new subprocesses have been created or existing subprocesses are deleted or substantially modified, then the processes may require modification.
 - The implementation selections for each subprocess. Based on legislative, policy, technological, and external environmental factors, or when existing implementation selections may no longer meet SFA needs, new implementation options may become preferable for some subprocesses.
 - Process and subprocess definitions. Any changes to business processes, subprocesses, and their implementation choices may have an impact on the modernization applications of the Blueprint architecture.
2. **Review Current Content** - the current content of the Blueprint subprocess document and associated models is examined in light of the proposed changes to determine what changes are appropriate.
3. **Recommend Changes** - where appropriate, recommend additions, modification, or deletions to the applicable models and documents. Recommendations for change should be coordinated with individual managers within SFA to ensure that any recommendations reflect their cumulative wisdom.
4. **Update Models and Documents** - submit requests for the inclusion of changes to the effected models and documents. Requests shall be processed in accordance with the SFA configuration management guidelines.

Process for Reviewing and Updating the Blueprint Technology

Updating the IT supporting the Blueprint requires changes to documented technology components within the Blueprint. The IT is effected by changes in overall **technologies**, changes in **standards**, and changes in available **products**. Changes in any of these areas, but most likely changes in technologies, may require realignment of the resulting architecture topology.

The product of this activity is a list of proposed changes to the IT documents supporting the Blueprint with supporting rationale. Changes to the Blueprint architecture will be published to interested persons within SFA, the SFA and ED communities, and supporting contractors. Individual project teams should choose to act upon these changes by proposing modifications to their architectures. SFA Change Management begins the process of implementing these proposals.

Technologies

The manager of the AWG will initiate a review of Blueprint technology not more than three years after this document is published. This will be done when there is a significant change in IT

application platform technology, or when target applications defined in Blueprint document require that new technologies be considered. The review shall be performed in conjunction with a group of SFA managers drawn from appropriate elements of the organization. To accomplish this review, the following steps shall be taken:

1. **Review Technology Changes** - a review should be made of the “state of the art” technology, with particular emphasis on three areas:
 - New, emerging technologies that have the potential to impact the delivery of services through the Blueprint architecture.
 - Emerging technologies that are becoming regarded as mature and able to support mission-critical applications.
 - Mature technologies that are becoming regarded as obsolete and thus no longer able to support effectively mission-critical applications.
2. **Review Technologies Currently Supported** - the technologies currently supported by the Blueprint architecture should be reviewed to see whether, in light of technological changes, modifications should be made to the technologies.
3. **Recommend Changes** - where appropriate, recommend additions, modification, or deletions to the products supported by the document under review. Recommendations for change should be coordinated with individual managers within SFA to ensure that any recommendations reflect their cumulative wisdom.
4. **Update Document** - submit requests for the inclusion of changes to products supported in the document. Requests shall be processed in accordance with the SFA configuration management guidelines.

Standards

The manager of the AWG will initiate a review of technical standards not more than two years after this document is published or when there is significant change in industry-supported standards. The review shall be performed in conjunction with the AWG and a group of SFA managers drawn from appropriate parts of the organization. Changes to standards supported by the target architecture will also require modifications to the *Project EASI/ED COE Document* as it serves as a baseline for the Blueprint architecture.

To accomplish this review, the following steps shall be taken:

1. **Review Standards Changes** - standards may taken under review for any portion of the Blueprint architecture products and services. A review of the current environment for the applicable standards should be made with emphasis in these four areas:
 - New, emerging standards in an area where no standards existed previously.
 - New official standards ratified by an existing standards body.
 - New de facto standards created by the market success of a product, service, or technology.
 - Existing standards that are losing support, or being supplanted by another standard.

2. **Review Standards Currently Supported** - the standards currently supported within SFA or documented within the Blueprint architecture should be reviewed to see whether, in light of recent changes, modifications should be made to the View.
3. **Recommend Changes** - where appropriate, recommend additions, modification, or deletions to the standards supported by the Blueprint architecture. Recommendations for change should be coordinated with individual managers within SFA to ensure that any recommendations reflect their cumulative wisdom.
4. **Update Document** - submit requests for the inclusion of changes to the standards supported in the appropriate documents. Requests shall be made in accordance with SFA configuration management guidelines.

Products

The manager of the AWG will initiate a review of recommended products not more than six months after this document is published or when there is significant change in available technical products. The review shall be performed in conjunction with the AWG and a group of SFA managers drawn from appropriate parts of the organization. To accomplish this review, the following steps shall be taken:

1. **Review Products Changes** - a review should be made of the current market and products environment, with particular emphasis on four areas:
 - New products and vendors offering capabilities not previously available.
 - New versions of existing products offering significant enhancements or upgrades in performance or capability.
 - Existing products that are becoming regarded as obsolete.
 - Vendors with financial and/or product development problems, who may be unable to sustain long-term support for their products.
2. **Review Products Currently Supported** - the products currently supported by SFA should be reviewed to see whether, in light of recent changes, modifications should be made to the documented product list under review.
3. **Recommend changes** - where appropriate, recommend additions, modification, or deletions to the products supported by document under review. Recommendations for change should be coordinated with individual managers within SFA to ensure that any recommendations reflect their cumulative wisdom.
4. **Update Document** - submit requests for the inclusion of changes to products supported in the document. Requests shall be processed in accordance with the SFA configuration management guidelines.

Sequencing Plan

Changes to Blueprint requirements, processes, subprocesses, technologies, or products are likely to drive changes to the sequencing plan. As these changes are determined, the appropriate modifications to the sequencing plan should be introduced.

C.1.3.3 Change Management

The SFA CM process is a peer review of the impact of proposed changes to IT, tools, and standards. It builds upon the successful change management organization within PSS. The process is designed to:

- receive and develop new ideas into project proposals;
- evaluate project proposals through a systematic, visible process;
- test proposals against the SFA business strategy;
- examine and communicate the effects of proposed changes before they are implemented; and
- foster communication across and within SFA groups effected by changes.

Groups within SFA serve specific roles within the change management process. These responsibilities are outlined below:

- **ED Community and a Business Process Owner** - develop a new idea into a proposal
- **IT sponsors** - responsible for reviewing the standards.
- **AMB** - ensures proposals are complete and manageable, that the proposed change harmonizes with the SFA architecture, in addition to confirming that the organization has reached consensus on the impact of the change.
- **DSB** - tests proposals for technical and business value; the DSG may call upon the AWG for assistance with the technical review, and Division Directors for assistance with the business review.
- **IRB** - sets priorities of proposals within the SFA IT investment strategy.

Figure C-4 graphically depicts the groups participating in the change review process and their interactions.

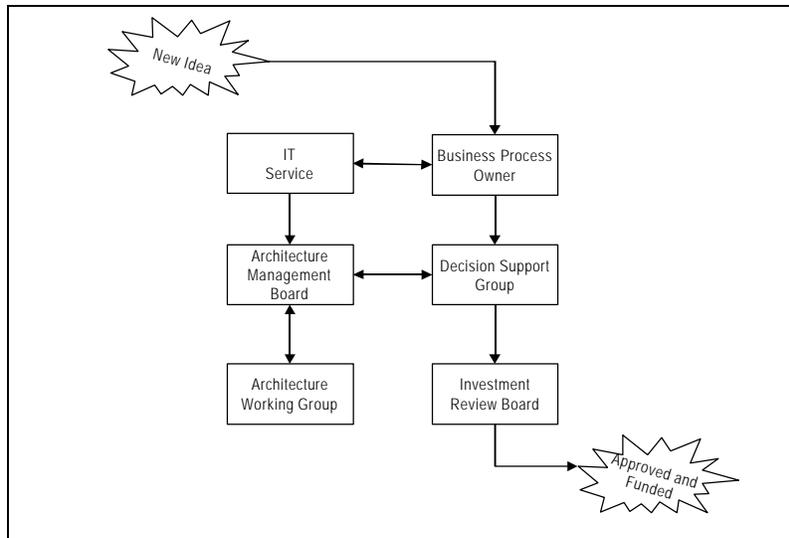


Figure C-4: Change Management and Investment Review

The following subsections describe the change management process from the point of view of the organizational groups listed below:

- ED Community and Business Process Owner
- IT Service
- Architecture Management Board
- Decision Support Group
- Investment Review Board

ED Community and Business Process Owner

Interested individuals and groups within the ED community, including SFA staff, may create new ideas to benefit the business. A business process owner initiates the following steps of the change management process:

- A new idea emerges, and a draft business case is prepared.
- The SFA business process owner, representing the group judged to be most affected by the new idea, checks the new idea for feasibility. Ideally the business owner becomes the business sponsor of the proposal.
- A project manager is chosen from PSS who assumes responsibility for the initiative through project completion.
- Preparation begins on the business case for presentation to the AMB and DSB.

Upon completion of these tasks, the proposal moves to the IT service for that business owner.

IT Service

The IT service associated with the business process owner takes responsibility for technical aspects of the proposal. The IT service checks the technical feasibility of the solution described

in the business case, helping to specify cost, schedule, technology, and other resource information.

Once the technical and business case is complete, the proposal goes to the AMB.

Architecture Management Board

The AMB is described in subsection C.1.3.1. For the purposes of the change management process, the Board is supplemented with business leaders as needed. The AMB provides a one-level review of IT projects. The AMB determines (1) whether the proposal is in line with PSS programs and (2) whether the impact on systems is manageable. Project requests are forwarded, sent back for clarification, or denied. The AMB constitutes the peer review required by the ED investment management process.

In order to keep the workload manageable, the AMB will review proposals with these characteristics:

- Project cost greater than \$100,000
- Items with likely cross-system impact

In order to keep the AMB tasks manageable, the following information is required for the review:

- Project description and impact statement
- Business case
- Schedule
- Cost estimate

Under the AMB, the proposal undergoes three reviews:

- **Technical Review** - conducted by a team within PSS with possible assistance of the AWG
- **Operational Review** - conducted by a subset of the Division Directors.
- **Acquisition Review** - conducted by an SFA acquisition specialist.

Proposals are rejected, sent back for clarification, or approved. An approved proposal is forwarded to the DSG.

Decision Support Group

The DSG consists of representatives from each service, two from TPAS, a Program Management Office representative, a senior PSS representative and a representative from Acquisition Management.

To keep the workload of the DSG manageable, the following minimums are set on projects subject to review:

- Project cost greater than \$100,000.
- Items with cross-system impact.
- Items representing a variance of more than 10% over planned cost or schedule

The DSG manages the proposal through four reviews:

- **Budget Review** - conducted by the appropriate budget team; this review verifies that the proposal meets the pertinent budget requirements.
- **Business Review** - conducted by the appropriate business team; the review team verifies the soundness of the proposal's business case and assesses its impact on business programs.
- **Acquisition Strategy Review** - conducted by the Acquisition Management Group.
- **Architecture and Technical Risk and Impact Review** - for this review, the Director of PSS calls upon the resources of the AWG; if the chair of the AWG determines that the proposal requires further review, it may be submitted back to the AMB.

Upon approval, the proposal may take one of two courses. If the project is of sufficient size and scope, measured by cost, risk, or political sensitivity, it moves to the Investment Review Board. Otherwise, the DSG, as representatives of the IRB, makes the final approval.

Investment Review Board

The IRB serves SFA at the highest level of strategy and policy review for new projects. IRB is formed from a subset of the Service Directors chaired by the COO of SFA.

Proposals subject to IRB review possess the following characteristics:

- Project cost exceeds \$500,000.
- Politically sensitive.
- Demonstrates a greater than 10% change in cost or schedule.

Proposals may be denied, sent back for clarification, or approved. An approved proposal may have its activities entered into the SFA master schedule. Details on the Investment Review process are presented in Section C.2 - IT Investment Management.

DSG and IRB provide the IT investment review required by the Clinger-Cohen Act.

C.1.4 Charter Examples

On the following pages charters for the AMB and the AWG are presented.

Charter for the Architecture Management Board

Charter Architecture Management Board

Mission Statement: The Architecture Management Board (AMB) is formed to support the business strategy of the Office of Student Financial Assistance Programs (SFA) through enterprise architecture management.

Objectives: The AMB ensures that the SFA architecture is kept current and that it is communicated throughout ED and the community.

Duties: The following are the AMB duties.

- Manage the SFA architecture
- Ensure that the business strategy is implemented in the architecture
- Ensure that the architecture is applied to SFA IT projects
- Detect changes in the technical and business environment
- Communicate the architecture
- Periodically engage outside experts for an independent architecture review
- Task and monitor the Architecture Working Group (AWG)
- Interact with the Investment Review Board (IRB) on architecture projects and funding.
- Represent the SFA architecture organization at meetings of customers and the SFA community
- Foster the architecture capability of SFA staff

Board Composition: The AMB consists of PSS Division Directors chaired by the Director of PSS.

Resources/Constraints: COO and Director PSS support the AMB with resources it requires. Subject to management approval, AMB is permitted to engage experts, both internal and external, to fulfil its mission. Experts may be required in financial management, contract management, or organizational communications. Training and professional facilitation is available as needed. Other resources will be negotiated. Ultimately, success depends upon the initiative, expertise, and dedication of the Board members.

The COO, through the Director of PSS is the controlling authority of the AMB. The AMB will task the AWG with any long-term projects, projects requiring management of contractors, and projects requiring specialized technical expertise.

Board Duration: The work of the AMB will be reviewed after 1 year, and the charter will be extended as necessary.

Charter for the Architecture Working Group

Charter Architecture Working Group

Mission Statement: The Architecture Working Group (AWG) is formed to support the responsibilities of the Architecture Management Board (AMB) to maintain, administer, and assess the enterprise architecture of the Office of Student Financial Assistance Programs (SFA).

Objectives: The AWG objectives are to provide high quality support to the AMB, ensuring that the SFA architecture is kept up to date and aligned with business and technology requirements.

Duties: The duties of the AWG include:

- Answer the requests of the AMB
- Report regularly to the AMB
- Manage the enterprise architecture
- Communicate the architecture internally and externally
- Aggrandize the value of architecture to SFA
- Track technology and architecture trends in the press
- Conducting technology investigations
- Conduct studies and analyses
- Participate in technical conferences
- Participate in financial aid community conferences
- Participate in and monitor implementation projects
- Identify and manage virtual team members

Group Composition: The AWG is chaired by the Director of TPAS and consists of at least two full-time people. Should specialized domain or technical expertise be required, with the express approval of the AMB, the AWG may engage virtual team members from the PSS Divisions on temporary assignments to the AWG.

Resources/Constraints: The Director of PSS and the Director of TPAS support the AWG with the required resources. The AWG may solicit from the AMB the authority to engage expertise both internal and external. Team members may seek outside resources for professional facilitation, training, and technical or subject matter advice as necessary. Other resources will be negotiated as needed. Success ultimately depends upon the initiative, expertise, and dedication of the group members. The Director PSS is the controlling authority of the AWG.

Group Duration: The work of the AWG will be reviewed after 1 year, and the charter will be extended as necessary.

C.2 IT Investment Management

The material in this Appendix section was drawn from the ED/OSFAP *IT Investment Management Operating Procedures Version 1.0*.

SFA's IT investment management process is a business driven approach to managing IT initiatives that links the strategic priorities of SFA to the selection, control and evaluation of IT initiatives. The focus of the IT investment management process is to ensure that SFA's business priorities are continuously met by:

- selecting initiatives that best support the goals and objectives of SFA;
- controlling initiatives once they are selected to ensure they are still aligned to SFA priorities and appropriate funding is provided; and
- evaluating initiatives after they have been completed to understand any deviations from established benefits, cost and schedule targets.

The IT investment management process provides SFA with:

- clear accountability for each IT initiative (who is the sponsor, when does it start, when does it end, what are the benefits, how much it will cost, how will it be measured);
- a common understanding of when and how funding decisions are made;
- a process for managing SFA's entire IT Portfolio;
- a process for consistent and repeatable assessments of all IT initiatives; and,
- standardized and concise documentation for each IT initiative.

C.2.1 Decision-Making Structure

The decision-making structure that ensures effective IT investment management consists of three groups:

- Business Sponsors
- The Decision Support Group (DSG)
- The Investment Review Board (IRB)

In Figure C-5, the relationships among the organizational groups are depicted.

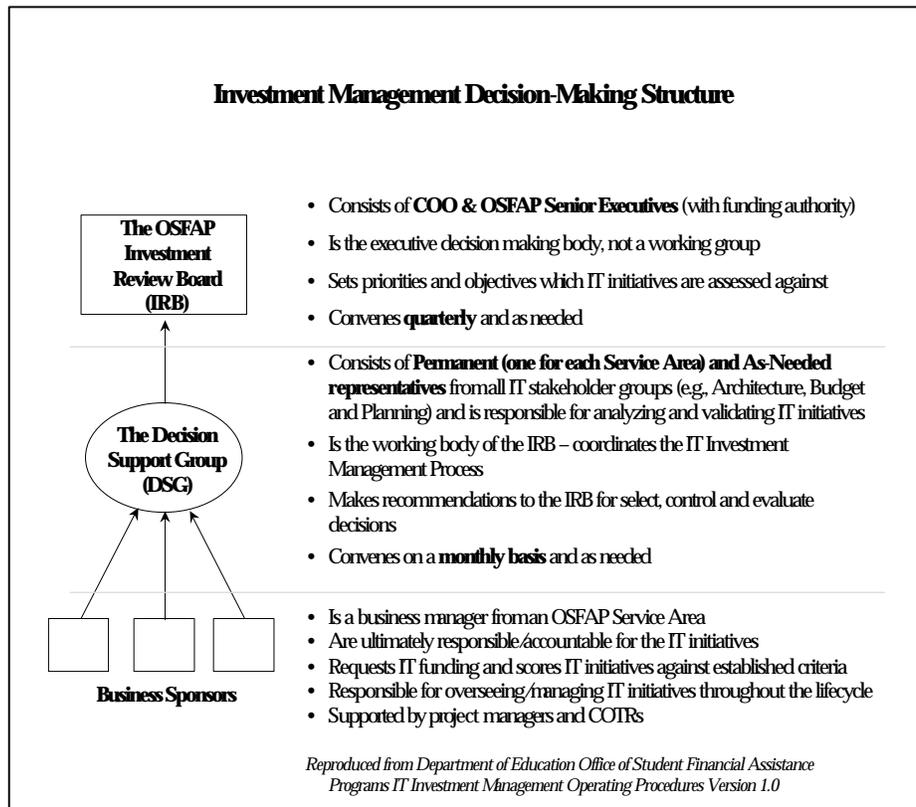


Figure C-5: Investment Management Decision-Making Structure

C.2.1.1 Business Sponsor

A business sponsor is the person (in a Service Area) who is ultimately responsible for the IT initiative. Their role in the IT investment management process includes:

- conducting preliminary analysis to determine the feasibility of the initiative;
- providing supporting documentation to request funding for the initiative;
- scoring the initiative using IT initiative prioritization criteria;
- informing the DSG on the progress of initiatives that have been funded; and
- evaluating initiatives that have been completed.

Business sponsors are accountable for the IT initiatives and can be supported by project managers and COIRs in the following activities: conducting the initial analysis to determine the feasibility of the initiative, developing the funding request, managing the initiative to ensure that goals outlined in the funding request are met and evaluating the outcome of the initiative after it is completed. Specifically, the project manager can be responsible for managing the initiative day-to-day and the COIR can be responsible for overseeing the contract for developing the initiative.

C.2.1.2 Decision Support Group (DSG)

The DSG conducts an “across-the-board” analysis and review of all IT initiatives for the IRB and manages the IT investment management process by:

- coaching business sponsors in the analysis of initiatives and development of funding requests;
- receiving and reviewing funding requests and IT initiative prioritization scores from business sponsors;
- preparing a recommendation memo for the IRB with a prioritized ranking of IT initiatives and recommended funding levels;
- monitoring IT initiatives against cost, schedule, and benefit estimates documented in the funding request and addressing funding issues that may arise;
- preparing a recommendation memo for the IRB for modification or cancellation of funding for initiatives; and
- updating IT initiative prioritization criteria based upon SFA’s strategic direction.

The DSG will meet monthly (more frequent meetings may be necessary during the development of the investment management process and during the budget formulation process). The DSG is comprised of the following people:

- permanent members including a representative from each Service Area (with an alternate), each of whom have voting privileges; and
- as-needed members include subject matter experts called upon to assist in the review of investments (e.g. technical expertise). (A technical review board may be used to ensure that the initiative is sound and viable from a technical perspective).

C.2.1.3 Investment Review Board (IRB)

The IRB is the ultimate executive decision-making body and makes the final funding decision in the IT investment management process:

- Makes funding decisions to select the IT initiatives that will most effectively further SFA’s priorities and form the SFA IT budget request to OMB based upon recommendations from the DSG; and,
- Approves termination of, or changes to, the funding of IT initiatives that demonstrate unacceptable risk, progress, or costs after initial selection.

The IRB will meet quarterly, or as requested by the IRB Chairperson (COO) to make IT investments decisions. The IRB consists of the following people:

- Principal members each of whom have voting privileges (COO & Senior Executives)
- Non-voting members that serve in an advisory role to the IRB (this would include DSG and subject matter experts as needed)

C.2.2 Process Overview

Critical to the success of IT investment management is integration with the overall budgeting and strategic planning processes.

C.2.2.1 Strategic Planning Activities

- SFA's Strategic Plan includes goals, objectives and strategies which form the basis for aligning investment decisions to SFA's strategic priorities.
- The SFA Annual Performance Plan outlines specific performance measures and targets used to measure progress toward the goals and objectives defined in the strategic plan.

C.2.2.2 Investment Management Activities

- IT investment management identifies the IT initiatives which best support SFA in achieving the goals and objectives outlined in the strategic plan.
- IT investment management calls for assessing the progress of IT initiatives against the performance measures and targets established in the Annual Performance Plan.

C.2.2.3 Budget Activities

- The IT initiatives selected form the SFA IT budget.

Linking strategic planning, IT investment management, and budgeting activities enables SFA to translate business priorities into IT investment decisions and increase the business value received from its IT initiatives.

C.2.3 Process Phases

The SFA IT investment management process consists of three phases – Select, Control, and Evaluate. Adopting this phased approach ensures that each IT initiative is business driven, financially sound, technically sound and clearly accounted for. Figure C-6 presents an overview of the three phases.

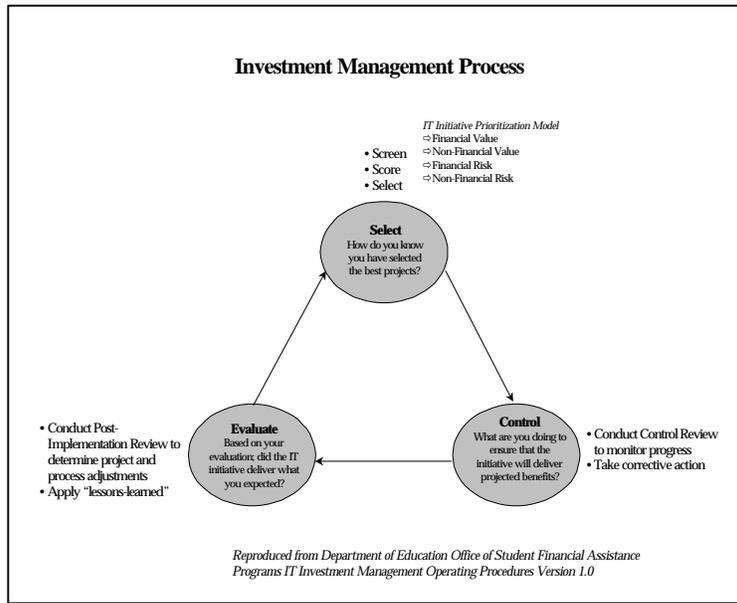


Figure C-6: Investment Management Process

C.2.3.1 Select Phase

The Select phase is conducted annually as part of the budget formulation cycle, or during budget execution for IT initiative funding requests that are deemed "immediate needs." IT initiatives are selected using the SFA established decision-making approach, a standard set of criteria for assessing and ranking investments. All IT initiatives selected for funding formulate the SFA IT Portfolio. Senior executives from each Service Area are involved in the decision making process to ensure that decisions are made with SFA's priorities in mind. The sequential review by each level of management is depicted in Figure C-7. The Select phase ensures that investments selected have clearly defined costs, benefits and milestones which act as performance measures for monitoring the initiative during the Control phase.

C.2.3.2 Control Phase

In the Control phase, IT initiatives are monitored against costs, benefits and schedule targets and are periodically assessed to ensure that they are still aligned to SFA goals and priorities. Most importantly, the control phase serves as an opportunity for the business sponsor to raise issues that have impacted (or may impact) the cost, schedule or benefits realization timeframe for the IT initiative. The DSG reviews issues raised by business sponsors and provides recommendations to modify or cancel funding to the IRB.

C.2.3.3 Evaluate Phase

In the Evaluate phase, post-implementation reviews are performed 3-12 months after the IT initiative has been completed. A post-implementation review evaluates the actual costs, benefits and schedule against baselines developed in the IT Initiative Funding Request And examines performance data to identify discrepancies against planned objectives. Results from the reviews are used as a "lessons learned" exercise to continuously improve SFA's Select and Control phases.

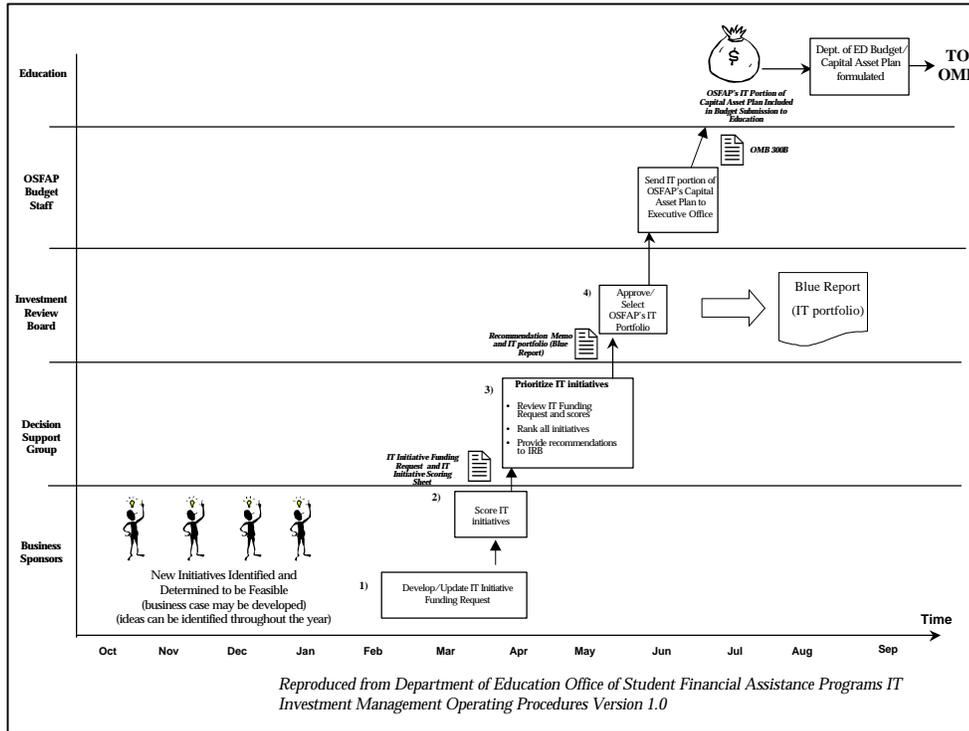


Figure C-7: Select Process - Budget Formulation

The select process, conducted as part of budget formulation, assesses and prioritizes new IT initiatives ideas and existing IT initiatives resulting in the selection of IT initiatives that form the SFA IT Portfolio. The activities comprising this phase are described in Table C-2. The following key terms/tools will be used to throughout the select process:

- **Feasibility** – An initial, preliminary assessment by the business sponsor to determine if an IT initiative idea meets a set of minimum criteria (e.g., economically feasible, technically possible, functionally reasonable.) This determination concludes whether the initiative should be pursued any further.
- **Business Case** – Thorough, rigorous analysis used to determine the value provided by an IT initiative
- **IT Initiative Funding Request** – Required for each IT initiative when requesting funding. Summarizes the key characteristics and value provided by the IT initiative. Also includes the cost, schedule and benefits used to track the progress of the initiative during the control phase .
- **IT Initiative Scoring Sheet** – Mechanism used to score IT initiatives based on established decision making criteria and weights.

- **SFA IT Portfolio (Blue Report)** – Summary spreadsheet that lists every SFA IT initiative and the key characteristics of each IT initiative. Created and updated by the DSG for the purpose of tracking the SFA IT Portfolio.

#	Activity	Tools Used	Output/Outcome	Responsible
1	Develop/ Update IT Initiative Funding Request	IT Initiative Funding Request (<i>business case as necessary</i>)	<ul style="list-style-type: none"> • Decision to move forward with a formal funding request • IT Initiative Funding Request developed or updated 	Business Sponsor supported by Project Managers and COTRs
2	Score IT Initiative	IT Initiative Scoring Sheet	Each IT initiative is scored against SFA priorities	Business Sponsor
3	Prioritize IT Initiatives	<ul style="list-style-type: none"> • IT Initiative Funding Requests • IT Initiative Scoring Sheets • Blue Report (SFA IT Portfolio) • DSG Select Recommendation Memo 	Recommended IT initiatives and funding levels included in a Recommendation Memo to the IRB	DSG
4	Approve/Select SFA IT Portfolio	<ul style="list-style-type: none"> • DSG Select Recommendation Memo • IT Initiative Funding Requests • IT Initiative Scoring Sheets • Blue Report (SFA IT Portfolio) 	Approved SFA IT Portfolio (IT Budget)	IRB

Table C-2: Select Process - Budget Formulation

C.2.3.4 Activity 1 – Develop/Update IT Initiative Funding Request

Table C-3 identifies the five tasks or steps in this activity. The first three steps in this activity are exclusive to new, enhancement and maintenance IT initiatives and serve as a screening process to filter out initiatives that are considered ‘not feasible’. These steps should be taken before significant time is spent completing the IT Initiative Funding Request. Business sponsors are accountable for completing the IT Initiative Funding Request but can receive support from project managers, COTRs and other employees.

#	Task	Tool Used	Output/Outcome	Responsible
1.1	Gain approval from a supervisor to pursue determining the feasibility of the IT initiative idea	N/A	Approval to move forward and determine the feasibility of the IT initiative	Any employee
1.2	Determine whether the IT initiative is economically feasible, technically possible and functionally reasonable	Minimum criteria to determine feasibility (TBD)	<ul style="list-style-type: none"> Feasibility of IT initiative determined Decision made to move forward with a formal funding request 	Any employee
1.3	Identify the business sponsor	N/A	Business sponsor identified	Senior Executive or Division Director
1.4	Begin conducting analysis to develop/update the IT Initiative Funding Request	<ul style="list-style-type: none"> Business Case Template (as needed) IT Initiative Funding Request 	Analysis started and impacted parties involved (<i>possibly gained buy-in</i>)	Business Sponsor supported by Project Manager and COTRs
1.5	Complete the IT Initiative Funding Request	<ul style="list-style-type: none"> Business Case Template (as needed) IT Initiative Funding Request 	IT Initiative Funding Request completed/ updated (<i>business case may also be conducted</i>)	Business Sponsor supported by Project Manager and COTRs

Table C-3: Activity 1 Develop/Update IT Initiative Funding Request

C.2.3.5 Activity 2 – Score IT Initiative

After conducting the analysis to complete the IT Initiative Funding Request, the business sponsor scores the initiative using the IT Initiative Scoring Sheet. The IT initiative prioritization score provides an objective and rational mechanism for ranking IT initiatives (linked to SFA priorities) and is submitted to the DSG along with the IT Initiative Funding Request. See Table C-4, below.

#	Task	Tool Used	Output/Outcome	Responsible
2.1	Score the IT initiative	IT Initiative Scoring Sheet	IT initiative scored	Business Sponsor
2.2	Peer review (TBD)	IT Initiative Scoring Sheet	IT Initiative Scoring Sheet reviewed and validated by peers	Business Sponsors
2.3	Submit the IT Initiative Scoring Sheet with the IT Initiative Funding Request to the DSG (<i>attach business case if available</i>)	<ul style="list-style-type: none"> IT Initiative Scoring Sheet IT Initiative Funding Request 	IT Initiative Scoring Sheet and IT Initiative Funding Request submitted to the DSG	Business Sponsor

Table C-4: Activity 2 – Score IT Initiative

C.2.3.6 Activity 3 – Prioritize IT initiatives

IT initiatives are ranked based on information in the IT Initiative Funding Requests and the IT Initiative Scoring Sheet. Once the IT initiatives are ranked, the DSG should review the information provided in the funding request and prioritize the IT initiatives. Multiple funding scenarios should be developed based on input from the SFA budget staff. The DSG produces a Recommendation Memo along with the ‘Blue Report’ that is forwarded to the IRB. The Blue Report is a spreadsheet of all IT initiatives that includes the most significant details regarding the characteristics of each IT initiative along with the recommended funding level for each initiative.

C.2.3.7 Activity 4 – Approve/Select SFA IT Portfolio

The IRB convenes once a year to approve the total SFA IT Portfolio for the budget request. Members of the IRB receive the DSG Select Recommendation Memo and ‘Blue Report’ prior to meeting, providing the opportunity for review and clarification of any issues with the IT initiatives. The outcome of the IRB meeting is an approved IT Portfolio which is documented in the ‘Blue Report.’

After the Investment Review Board approves the SFA IT Portfolio, the Budget staff incorporates each initiative selected by the IRB into the SFA IT budget. Once appropriations are received the initiatives can begin.

C.2.4 Control Process

The purpose of the control phase is to ensure that IT initiatives are achieving proposed benefits and to enable early identification of issues that may impact the cost, schedule or the benefit realization timeframe for IT initiatives. The control serves as the forum for raising issues and for ensuring that IT funding is allocated to the initiatives that best support SFA priorities. Figure C-8 provides an overview of this process.

Business sponsors establish an investment control review schedule when submitting the initial IT Initiative Funding Request. Once the IT initiative is funded and begins, Investment Control Worksheets are submitted to the Decision Support Group at the established milestone dates for new, enhancement, and maintenance initiatives and quarterly for operational initiatives. These reviews serve as an opportunity for business sponsors to elevate significant issues to management that may impact the cost, schedule and/or benefits of the initiative.

The DSG reviews the Investment Control Worksheets at their monthly meetings and forwards their recommendations to the Investment Review Board for approval. Once approved, the business sponsors implement the decisions. Tables C-5 and C-6 summarize who has what roles and performs what activities for the control phase.

Business Sponsor/Project Manager/COTR	Decision Support Group
<ul style="list-style-type: none"> • Management of IT initiatives <ul style="list-style-type: none"> - Oversee the development team - Manage the schedule - Manage the costs - Manage the scope - Measure the benefits • Identify and elevate issues that have impacted (or may impact) the funding of an IT initiative 	Review Investment Control Worksheets to identify significant cost overruns and schedule slippages and respond to issues raised by business sponsors to determine if funding changes to the SFA IT Portfolio are necessary

Table C-5: Control Roles

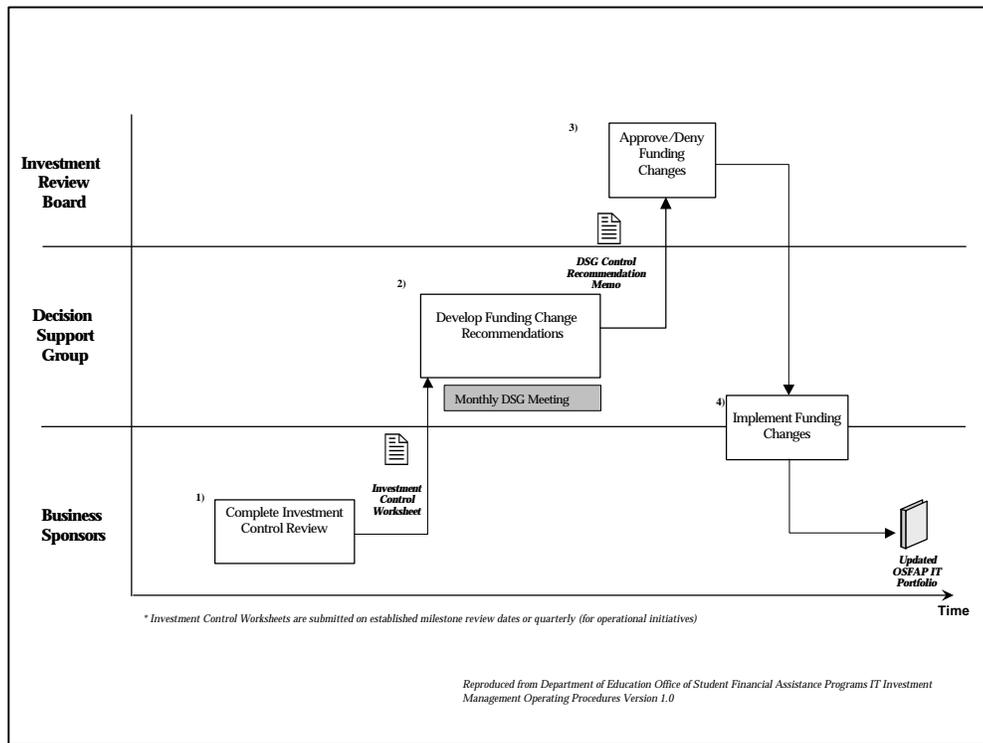


Figure C-8: Control Process

#	Activity	Tools Used	Output/Outcome	Responsible
1	Complete Investment Control Review	Investment Control Worksheet	Investment Control Worksheet completed and submitted to the DSG	Business Sponsors
2	Develop Funding Change Recommendations	<ul style="list-style-type: none"> Investment Control Worksheets DSG Control Recommendation Memo 	<ul style="list-style-type: none"> Progress reviewed and issues identified Recommended funding changes included in a recommendation memo to the IRB 	DSG
3	Approve/Deny Funding Changes	<ul style="list-style-type: none"> Investment Control Worksheets DSG Control Recommendation Memo 	Funding changes approved/denied by the IRB	IRB
4	Implement Funding Changes	N/A	<ul style="list-style-type: none"> Funding changes implemented SFA IT Portfolio adjusted 	<ul style="list-style-type: none"> Business Sponsors SFA Budget staff

Table C-6: Control Process

The following pages detail out the activities, tasks and tools used to control IT initiatives.

C.2.4.1 Activity 1 – Complete Investment Control Review

The business sponsor establishes an investment control schedule when submitting the IT Initiative Funding Request. New, enhancement and maintenance initiatives are reviewed at established milestone dates. Operational initiatives should be reviewed when deemed necessary. Table C-7 identifies the tasks for this Activity.

#	Task	Tools Used	Output/Outcome	Responsible
1.1	Complete Investment Control Worksheet	Investment Control Worksheet	Investment Control Worksheet completed	Business Sponsor
1.2	Submit Investment Control Worksheet to DSG	Investment Control Worksheet	Investment Control Worksheet submitted to the DSG	Business Sponsor

Table C-7: Activity 1 – Complete Investment Control Review

C.2.4.2 Activity 2 – Develop Funding Change Recommendations

Table C-8 depicts the tasks to carry out this Activity.

#	Task	Tools Used	Output/Outcome	Responsible
2.1	Review Investment Control Worksheets	Investment Control Worksheets	Progress reviewed and issues identified	DSG
2.2	Develop recommendations for funding changes to IT initiatives (<i>indicate recommendation on the Investment Control Worksheet</i>)	DSG Control Recommendation Memo	Recommended funding changes included in a recommendation memo to the IRB	DSG
2.3	Submit the DSG Control Recommendation Memo and Investment Control Worksheets to the IRB	<ul style="list-style-type: none"> • DSG Control Recommendation Memo • Investment Control Worksheets 	DSG Control Recommendation Memo and Investment Control Worksheets submitted to the IRB	DSG

Table C-8: Activity 2 – Develop Funding Change Recommendations

C.2.4.3 Activity 3 – Approve/Deny Funding Changes

The IRB receives a recommendation memo and Investment Control Worksheets (if funding changes are recommended). After reviewing the recommended changes, the IRB will determine if a meeting is necessary (outside of the quarterly IRB meetings). The IRB should meet only if there is disagreement among the IRB members regarding the recommendations.

C.2.4.4 Activity 4 – Implement Funding Changes

It is important to remember that the DSG's role in monitoring IT initiatives is not to 'police' IT initiatives but instead to act as a forum for raising significant issues with IT initiatives. The business sponsor and project manager maintain the responsibility for day-to-day management of IT initiatives.

C.2.5 Evaluate Process

The evaluate phase calls for post-implementation reviews of IT initiatives 3-12 months after they have been completed. The purpose of the post-implementation review is to determine how well the initiative is achieving intended benefits as well as documenting 'lessons learned'. The DSG focuses on the 'lessons learned' to continuously ensure that SFA selects the right IT initiatives and makes accurate and timely decisions to control IT initiatives. Figure C-9 provides an overview of this process for investment management. This review should also involve representatives of the CRB and AMB and the ED/SLCDM support group.

The DSG prepares an annual recommendation memo that is submitted to the IRB. Included in this memo are trends that the DSG has identified in the execution of IT initiatives (particularly around costs, schedule and benefits) along with recommendations for areas of improvement. These recommendations are reviewed by the IRB and approved for implementation. For example, post-implementation reviews may identify that estimated costs frequently differ significantly from actual costs. The recommendation may be to build a standardized, reliable cost estimation methodology.

If the business sponsor is already conducting a post-implementation review as part of their initiative, the DSG post-implementation review is not necessary. A copy of the business sponsor's post-implementation review is sufficient for the DSG (as long as it addresses cost, schedule and benefits) and the representatives of the CRB and AMB and the ED/SLCDM support group.

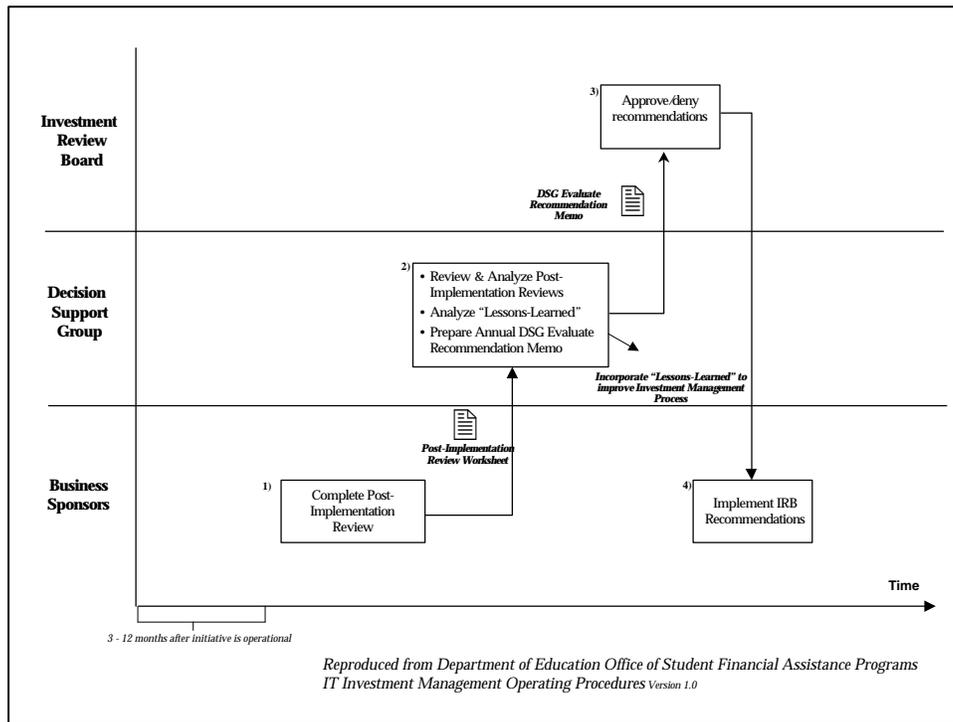


Figure C-9: Evaluate Process

The following pages detail out the activities, tasks and tools used to assess IT initiatives that have been completed and to continuously improve the IT investment management process. Table C-9 summarizes these activities.

#	Activity	Tools Used	Output/Outcome	Responsible
1	Complete Post-Implementation Review	Post-Implementation Review Worksheet	Post-Implementation Review Worksheet completed and submitted to the DSG	Business Sponsors
2	Analyze Lessons Learned	<ul style="list-style-type: none"> Post-Implementation Review Worksheets DSG Evaluate Recommendation Memo 	<ul style="list-style-type: none"> Lessons learned (trend analysis) completed Areas for improvement identified Recommendation memo submitted to IRB 	DSG
3	Approve/deny recommendations	DSG Evaluate Recommendation Memo	Recommendations reviewed and approved/denied by IRB	IRB
4	Implement IRB recommendations	DSG Evaluate Recommendation Memo	<ul style="list-style-type: none"> Necessary initiatives initiated Operating procedures updated to address recommendations 	<ul style="list-style-type: none"> IRB Business Sponsors

Table C-9: Evaluate Process

C.2.5.1 Activity 1 – Complete the Post-Implementation Review

A post-implementation review is requested 3-12 months after the IT initiative is completed. If the business sponsor has completed or is planning to complete a post-implementation review as part of his/her initiative, this step can be skipped (as long as it includes cost, schedule and benefits).

Otherwise, the business sponsor should proceed with completing the Post-Implementation Review worksheet.

C.2.5.2 Activity 2 – Analyze Lessons Learned

At least annually, the DSG identifies trends/areas for improvement based on the lessons learned and develops recommendations for improving the investment management processes. At least one monthly DSG meeting should be spent on post-implementation reviews. The exercise should focus on identifying ‘lessons learned’ from past experiences based upon information contained in the IT Initiative Funding Requests, IT Initiative Scoring Sheets, Investment Control Worksheets and Post-Implementation Reviews.

C.2.5.3 Activity 3 – Approve/Deny Recommendations

Table C-10 identifies the tasks for Activity 3.

#	Task	Tools Used	Output/Outcome	Responsible
3.1	Review the DSG Evaluate Recommendation memo	DSG Evaluate Recommendation Memo	DSG Evaluate Recommendation Memo reviewed	IRB
3.2	Convene IRB meeting to approve/deny recommendations (part of quarterly meeting)	DSG Evaluate Recommendation Memo	IRB meeting held and recommendations approved/denied	IRB

Table C-10: Activity 3 – Approve/Deny Recommendations

C.2.5.4 Activity 4 – Implement IRB Recommendations

Table C-11 identifies the tasks for Activity 4.

#	Task	Tools Used	Output/Outcome	Responsible
4.1	Communicate approved recommendations to DSG	N/A	Approval/denial of recommendations communicated to the DSG	DSG
4.2	Implement approved recommendations	<ul style="list-style-type: none"> • Operating procedures • Special Initiatives 	<ul style="list-style-type: none"> • Necessary initiatives initiated • Operating procedures updated to address recommendations 	<ul style="list-style-type: none"> • DSG • Business Sponsors

Table C-11: Activity 4 – Implement IRB Recommendations

Further information on Investment Management is available in the OSFAP *IT Investment Management Operating Procedures*

C.3 Acquisition Management

SFA has selected to align its software acquisition activities with the Software Acquisition Capability Maturity Model (SA-CMM) developed by the Software Engineering Institute (SEI) at Carnegie Mellon University. The initial alignment is with the standards and practices of Maturity Level 2, the Repeatable level. At the Repeatable level, basic software acquisition processes are established and the necessary process discipline is in place to repeat earlier successes of similar projects.

The activities of SFA's acquisition management process are based upon the key process areas (KPA) of SA-CMM Level 2 and the best practices of acquisition management. The following paragraphs present the activities that occur within each of the SA-CMM KPAs. The KPAs and related activities are discussed in somewhat of a chronological order; however, some of the activities of one KPA may overlap or be performed in parallel with the activities of another KPA. The following subsections describe the Level 2 KPAs:

- Subsection C.3.1 Software Acquisition Planning
- Subsection C.3.2 Solicitation
- Subsection C.3.3 Requirements Development and Management
- Subsection C.3.4 Project Management
- Subsection C.3.5 Contract Tracking and Oversight
- Subsection C.3.6 Evaluation
- Subsection C.3.7 Transition to Support

C.3.1 Software Acquisition Planning

The objective of software acquisition planning is to ensure that appropriate planning takes place for the acquisition of software products and services and that all aspects of the project are considered. Activities of the planning process identify the approach and plan to be followed in acquiring software for a specific project. In addition, the life cycle cost and schedule estimates for the software are prepared. The estimates are the means of supporting budget planning activities and determining the feasibility of acquiring the software given an expected life cycle cost and time period to implement and use system.

The planning activities are performed in accordance with policies for the acquisition of software. The activities are reviewed periodically by the acquisition management organization and, are reviewed by project management on both a periodic and event-driven basis.

Software acquisition planning activities typically include:

- Develop software acquisition strategy for project
- Prepare software acquisition plan
- Maintain software acquisition plan
- Prepare life cycle cost and schedule estimates
- Validate life cycle cost and schedule estimates

The software acquisition strategy being currently developed by SFA is aligned with the principles of efficiency and results orientation consistent with its PBO designation. Software products and services are acquired by SFA using a performance-based, modular strategy.

The following subsections describe the key activities of the strategy:

- Subsection C.3.1.1 Identify Change in Level of Service
- Subsection C.3.1.2 Develop Acquisition Plan
- Subsection C.3.1.3 Prepare Solicitation Package and Award Initial Work
- Subsection C.3.1.4 Award Additional Work to Be Performed

C.3.1.1 Identify Change in Level of Service

Periodically, either through formal review or because of changes in how services are provided by SFA, the software capability that provides a defined level of service may need to be changed. After a need for change in the level of service is identified, a systems capability initiative is defined by completing the following activities:

1. **Establish Envisioned Level of Service** - define where the organization wants to go or the envisioned level of service that is required to meet expected business requirements. The vision is defined in terms of outcome, in other words, what processes need to be supported and how the processes are to be provided. For example, a legislative mandate establishes a new student financial assistance program that requires functionality and delivery mechanisms not supported by existing systems capability. The vision addresses what new processes need to be established and how those processes are to be provided.
2. **Document Current Level of Service** - define current level of service in terms of supported functionality, features, technology, and performance levels as supported by current systems capability.

The difference between the envisioned and current level of service is defined as a systems capability initiative. The initiative includes software, hardware, organization, user procedures, and information technology infrastructure changes. As part of defining the initiative, systems capability metrics are established to quantify the expected systems capability and to evaluate acquired software products and services. Metrics may include the number of student financial assistance applications that can be handled daily by the systems capability, the maximum number of connected system users, and so forth.

C.3.1.2 Develop Acquisition Plan

After a systems capability initiative is defined and approved, a systems acquisition plan is developed. The plan is prepared by dividing the initiative into small, measurable, and manageable activities that are called modules, and then identifying when the systems capability provided by the modules needs to be available. Each module is expected to provide an incremental increase in efficiency and effectiveness in achieving the desired outcome of the systems capability initiative. The completion of each module results in new systems capability, supporting an aspect of the envisioned level of service. Collectively, the completed modules of activity provide the envisioned level of service.

A systems acquisition plan may range from few to many modules, depending upon the complexity of the required systems capability and the SFA strategy for assigning work to contractors. A module is the basis for preparing a task order that is awarded to a contractor.

The modules of the systems acquisition plan may be performed in a sequence and/or in parallel. For example, for a plan consisting of three modules, Modules 1 and 2 may be performed in parallel. Following this, Module 3, which is dependent upon the completion of both Modules 1

and 2, is performed as the final module, integrating its systems capability with that of Modules 1 and 2 to provide the envisioned level of service.

C.3.1.3 Prepare Solicitation Package and Award Initial Work

The systems acquisition plan is the basis for preparing a solicitation package, evaluating contractor responses, and awarding initial work. The solicitation package includes all modules of the plan. Instead of providing a contractor with lengthy inventories of specific requirements, a contractor is expected to satisfy the envisioned level of service by providing the necessary systems capability. Therefore, contractor proposals are expected to focus upon past performance and demonstrated capabilities.

In keeping with the PBO designation of SFA, the contracts for providing the envisioned level of service are awarded and measured according to specific evaluation metrics of cost to accomplish, and performance and capabilities. Therefore, a contractor is expected to have a business relationship with SFA: both the contractor and SFA will share the risks and rewards of the systems capability provided by the contractor. A contractor's initial and continuing relationship with SFA is determined by its evolving performance and demonstrated capabilities.

The proposal evaluation process defines and ranks a couple of contractors that could provide the required systems capability. These contractors become the pool providers from which SFA selects contractors to establish the level of service defined by the systems acquisition plan.

Depending upon the nature of the systems acquisition plan, an initial task order can be awarded to the contractors in a couple of difference ways. For example:

- the top ranked contractor is awarded the first module of the systems acquisition plan; or
- the top two ranked contractors are both awarded a module from the systems acquisition plan, with the modules being completed in parallel.

The initial awarding of work is based upon the evaluation metrics and the oral presentations made by contractors subsequent to submitting written proposals.

Contractors that are not awarded initial work, but are considered to be capable to provide the required work, are notified that they are included in the pool of eligible contractors associated with the systems acquisition plan. They are also informed that they may be awarded work in the future.

Though the contract performance is focused upon outcome instead of specific requirements, periodic progress reports and evaluations of work completed are made throughout the duration of the project.

C.3.1.4 Award Additional Work to Be Performed

In addition to other criteria, the cumulative performance and demonstrated capabilities of a contractor are used to determine whether the contractor is awarded additional modules of a software acquisition plan. At the completion of each module, the overall assessment of the contractor is adjusted according to the evaluative metrics of actual work performed. In addition, each eligible contractor presents a verbal proposal to complete the next module.

SFA re-ranks the pool of eligible contractors based upon the initial or adjusted assessment of performance and demonstrated capabilities and the results of the verbal proposals for completing the next module. The top ranked contractor is awarded the task order to complete the next module of the systems acquisition plan. At the completion of each module, the process of evaluating and re-ranking the pool of eligible contractors and then awarding a task order to the top ranked contractor continues until all plan modules are completed.

For example, assume that the following contractors are initially assessed and ranked as follows based upon initial evaluative metrics and oral presentations: Contractor A is 8.3, Contractor B is 7.9, and Contractor C is 7.7. Also, assume that Contractor A was awarded a task order to complete Module 1 of 3 modules. After completing Module 1, Contractor A is assessed with a performance and demonstrated capabilities ranking of 8.8. Assuming that the verbal proposals made by the eligible contractors do not elevate one contractor over the other, Contractor A would be awarded the additional task order to complete Module 2. However, if Contractor A had been assessed with a ranking of 7.8, and the verbal proposal of Contractor C resulted in changing the assessment of Contractor C from 7.7 to 8.1, Contractor C would be awarded the task order to complete Module 2.

C.3.2 Solicitation

For each software acquisition project, the solicitation process prepares a solicitation package (or request for proposal) that includes the defined business requirements to be satisfied by software products and services. In addition, the process evaluates responses received from candidate contractors and then selects the contractor(s) that is best capable of satisfying the contractual requirements.

Each solicitation activity is completed as planned at the beginning of the solicitation process for a specific project. The plans are prepared in accordance with the software portion of a written solicitation policy, ensuring that activities are conducted in a manner compliant with applicable laws, regulations, policies, and guidance for the solicitation. Additionally, the plans are developed with a focus on the unique business requirements to be satisfied by the acquisition project. The solicitation activities are reviewed periodically by the acquisition management organization, and are reviewed by project management on both a periodic and event-driven basis.

Solicitation activities typically include:

- Prepare solicitation plan
- Prepare proposal evaluation plan
- Prepare software cost and schedule estimates
- Validate software cost and schedule estimates
- Prepare solicitation package
- Evaluate candidate contractors' proposals
- Award contract(s) to provide required software

C.3.3 Requirements Development and Management

The objective of the requirements development and management process is to establish a common and unambiguous definition of software-related contractual requirements that is understood by the project team, end user, and the contractor(s). Contractual requirements include both business requirements and contract performance requirements. This process consists of the following two sub processes:

- **Requirements Development** - the development of contractual requirements, specifically, the software requirements that satisfy specific business needs, involves activities that decompose allocate system level requirements into specific software requirements.
- **Requirements Management** - software requirements management involves establishing and maintaining agreement among the project team, end users, and contractor with respect to the software-related contractual requirements. Activities include baselining the software requirements and controlling subsequent requirement changes. Requirements management ensures that software requirements remain unambiguous, traceable, verifiable, documented, and controlled throughout the life cycle of the acquisition project

The requirements development and management activities are performed in accordance with policies for establishing and managing the software-related contractual requirements. In addition, the activities are reviewed periodically by the acquisition management organization and are reviewed by project management on both a periodic and event-driven basis.

Requirements development and management activities typically include:

- Develop requirements development and management plan
- Develop and baseline software contractual requirements
- Place baseline under control of configuration management
- Analyze system requirements change requests for impact on the software acquired
- Analyze all change requests for impact on performance, architecture, supportability, system resource utilization, and contract schedule and cost
- Establish bi-directional traceability matrix for requirements and contractor work products and services
- Maintain bi-directional traceability matrix for duration of project

C.3.4 Project Management

The project management process is responsible for managing the activities of the project office (i.e., project management team) and contractor(s) to ensure a timely, efficient, and effective acquisition (i.e., implementation) of software products and services. Project management begins when the acquisition project is approved and ends when the acquired software products and services are transitioned to the software support organization.

By definition, the project management activities of acquisition management should be the same or complement the project management activities of the ED/SLCDM.

The project management activities are performed in accordance with policies for establishing and managing a software acquisition project. In addition, activities are reviewed periodically by the acquisition management organization and are reviewed by project management on both a periodic and event-driven basis.

Project management activities typically include:

- Prepare software acquisition management plan that includes progress and performance metrics
- Develop and implement management mechanisms
- Define project roles and responsibilities
- Develop and implement progress and performance metrics

- Monitor project activities and implement required activity procedures.
- Implement corrective action system for the identification and resolution of problems
- Monitor project status and resolve problems

C.3.5 Contract Tracking and Oversight

The objective of the contract tracking and oversight process is to ensure that contractual activities are performed in accordance with contractual requirements and that products and services will satisfy contractual requirements. During the life of the project, the contract tracking and oversight process provides input and guidance regarding the work completed by the contractor(s) and identifies problems and risks in the work completed. The contract serves as the basis for overseeing a contractor's work and evaluating the software products and services provided by the contractor.

The contract tracking and oversight activities are performed in accordance with policies for contract tracking and oversight activities. In addition, activities are reviewed periodically by the acquisition management organization and are reviewed by project management on both a periodic and event-driven basis.

Contract tracking and oversight activities typically include:

- Prepare contract tracking and oversight plan
- Develop progress and performance metrics
- Review and employ contractor software planning documents for software engineering oversight
- Conduct periodic project progress and performance reviews and discuss these reviews with the contractor
- Review and track software engineering environment for life cycle support for acquired software
- Record, track, and resolve contract performance problems
- Monitor project activities and contract performance

C.3.6 Evaluation

The evaluation process determines whether acquired software products and services meet contract requirements. The determination is completed prior to accepting the software and then transitioning the software to the software support organization. Before the evaluation activities are performed, an evaluation approach is prepared that includes specific technical and functional requirements, including acceptance criteria, which are included as part of both the solicitation package and the contract. The evaluation activities are conducted during the life of the project; the results are then used to determine whether the software products and services provided by the contractor(s) are acceptable. The evaluation activities interact with the contract tracking and oversight activities, providing information regarding contract performance.

The evaluation activities are performed in accordance with policies for evaluating acquired software products and services. In addition, activities are reviewed periodically by the acquisition management organization, and are reviewed by project management on both a periodic and event-driven basis.

Evaluation activities typically include:

- Develop evaluation plan
- Prepare evaluation requirements
- Include evaluation requirements in solicitation package and executed contract
- Assess contractor performance for compliance with evaluation requirements
- Evaluate software products and services
- Analyze results of evaluation to determine whether to accept products and services

C.3.7 Transition to Support

The transition to support process provides for the transition of acquired and accepted software products from the contractor(s) to the software support organization. The transition to support activities include developing and implementing plans for transitioning acquired software products. The planning effort ensures that required support resources are available and in place. As part of the plans, a schedule is prepared for the transition activities.

The software support organization for the acquired software is identified by the acquisition management organization at the time the solicitation package is initiated. The acquisition management organization involves the selected organization in planning for the transition of the acquired software. Prior to the transition of the software, the acquisition management organization provides the software support organization with an inventory of all of the software and related items that are to be transitioned. The acquisition management organization through the project team oversees the transition of the software products from the contractor(s) to the software support organization, ensuring that an orderly and smooth transition takes place.

The transition to support activities are performed in accordance with policies for transitioning software products to the software support organization. In addition, activities are reviewed periodically by the acquisition management organization and are reviewed by project management on both a periodic and event-driven basis.

Transition to support activities typically include:

- Develop transition to support plan
- Conduct post-implementation review of acquired software products and services
- Transfer software products after capability to support software products is demonstrated

C.4 Configuration Management

This section summarizes information from the *Project EASI/ED Configuration Management Plan* and relates that guidance to the Framework for Blueprint Delivery.

Configuration management (CM) is the implementation and execution of processes and procedures that ensure the systematic and orderly control of a system and its components throughout their life cycle. CM ensures system integrity by controlling changes to any component of a system. CM involves the disciplined application of technical and administrative management for four purposes:

1. To identify and document functional requirements and physical system component characteristics.
2. To control system component changes.
3. To record and report change request, processing, and implementation status.
4. To audit system components in order to verify the conformance to requirements, specifications, and/or technical documents.

CM benefits include:

- Improved management of requirements and change.
- Better impact analysis.
- Improved management of product information.
- More accurate project and subproject status information.
- Increased support in managing risk.
- Greater synergy within systems, subprojects, and projects.

The following items are subject to CM:

- All required documentation, including business and data models.
- All operational software and hardware components.
- All support software and hardware.
- Any additional items considered necessary; including test data, test cases, and other resources used to test the acceptability of a system component.

CM provides visibility into the status of evolving systems. Software developers, testers, project managers, Quality Assurance (QA) personnel, and customers benefit from CM information. CM answers the following:

- *What* changes were made to the system?
- *When* were the changes to the system made?
- *Who* made changes to the system?
- *Why* were the system changes made?

C.4.1 Configuration Management Requirements

The CM discipline comprises five requirement categories:

- CM organization requirements;

- configuration identification requirements;
- configuration control requirements;
- configuration status accounting requirements; and
- configuration auditing requirement.

C.4.1.1 Configuration Management Organization Requirements

A CM organization regulates established CM practices (such as configuration identification, control, status accounting, and auditing) and facilitates coordination among systems that interface or have design, functional, and/or operational dependencies. The CM organization's operational objectives include:

- Verifying that CIs meet their specified requirements.
- Ensuring that CIs are recorded with all known cross-system interfaces.
- Tracking CI status through auditing activities, and taking the appropriate corrective action when problems are discovered.
- Confirming that representatives from all affected systems agree on the configuration of pertinent CIs and changes to the configuration of those pertinent CIs.
- Prioritizing change requests.

The CM organization must comprise individuals who:

- Intimately understand the technical architectures and technical features of the interfacing systems, or who have readily available technical support in these areas.
- Possess authoritative influence and can control or provide direction regarding CM responsibilities and assignments.
- Have a vested interest in the successful integration and certification of the enterprise-wide system.
- Possess authoritative influence on resource allocation decisions.
- Have a thorough understanding of CM concepts and procedures.
- Have considerable system life cycle experience.
- Can build consensus and facilitate cooperation within diverse, multi-system development scenarios.

C.4.1.2 Configuration Identification Requirements

Configuration identification involves classifying the a system's structure, uniquely identifying individual system components, and documenting the components' functional and physical characteristics. The goals of configuration identification are to identify the system's components throughout the life cycle and to provide traceability between a system and related system products. Configuration identification answers the following:

- *What is the system configuration?*
- *What are the system components?*
- *What is the version of this system component?*

Configuration identification activities include:

- Selecting items to be placed under configuration control.
- Creating a nomenclature for uniquely identifying system components.
- Uniquely identifying the various system component versions.
- Defining relationships and interfaces among various system components.

C.4.1.3 Configuration Control Requirements

Configuration control begins after CIs are formally identified. Configuration control refers to the evaluation, coordination, approval or disapproval, and implementation of changes. It also involves managing the release of, and changes to, system components throughout the system life cycle. The goal of configuration control is to establish mechanisms that will help ensure the production and maintenance of quality system components. Configuration control answers the following:

- *What is controlled?*
- *How are changes to system components controlled?*
- *Who controls system changes?*

Configuration control activities include:

- Defining the change process.
- Establishing change control policies and procedures.
- Maintaining system component baselines.
- Processing system component changes.
- Tracking and documenting changes.
- Controlling the releases of system components.

C.4.1.4 Configuration Status Accounting Requirements

Configuration status accounting activities document and report information describing specific configuration items and their corresponding status. To manage CIs effectively, the CM organization must have access to this status information. The goal of status accounting is to provide a status record of all CIs, thus maintaining the traceability of all changes to a CI throughout its life cycle. Configuration status accounting answers the following:

- *What is the current configuration status for a CI?*
- *What are the current changes being considered?*
- *What changes have been made to the CI?*
- *How many components will be affected by this change?*

Configuration status accounting activities include:

- Determining the types of logs and reports required.
- Tracking the status of CM items.
- Tracking the status of changes to the system.
- Reporting the system status.
- Recording and reporting CM activities.

C.4.1.5 Configuration Auditing Requirements

The goals of configuration auditing are to:

- Ensure that CM processes and procedures are properly applied and support the organization's goals and objectives.
- Verify that all CIs are correctly identified, described, cross referenced, and produced.
- Verify that all approved changes to a CI are resolved.

For application software, two formal audits are widely used: Functional Configuration Audit (FCA) and Physical Configuration Audit (PCA). The FCA verifies that the software satisfies its requirements as stated in system the requirements specifications. The PCA determines whether or not the design and reference documents represent the software that was built. Configuration audit answers the following: *Does the CI satisfy the requirements?* and *Are all changes incorporated in this version of the CI?*

Configuration audit activities include:

- Defining audit schedule and procedures.
- Performing audits of the established baselines.
- Documenting and reporting audit results.

C.4.2 SFA Configuration Management Organization

This section describes the SFA CM organizational structure, its boards and groups, and their relationships among themselves as well as with other organizations, boards, and systems/subprojects. In addition, this section describes the SFA CM responsibilities, staffing, and staffing skill sets.

C.4.2.1 SFA CM Organizational Structure

The SFA CM organizational structure comprises three main groups:

- The Change Review Board (CRB).
- The Configuration Management Administrative group (CMA).
- Blueprint subproject Configuration Control Board (CCB).

Figure C-10 depicts the SFA CM organizational structure.

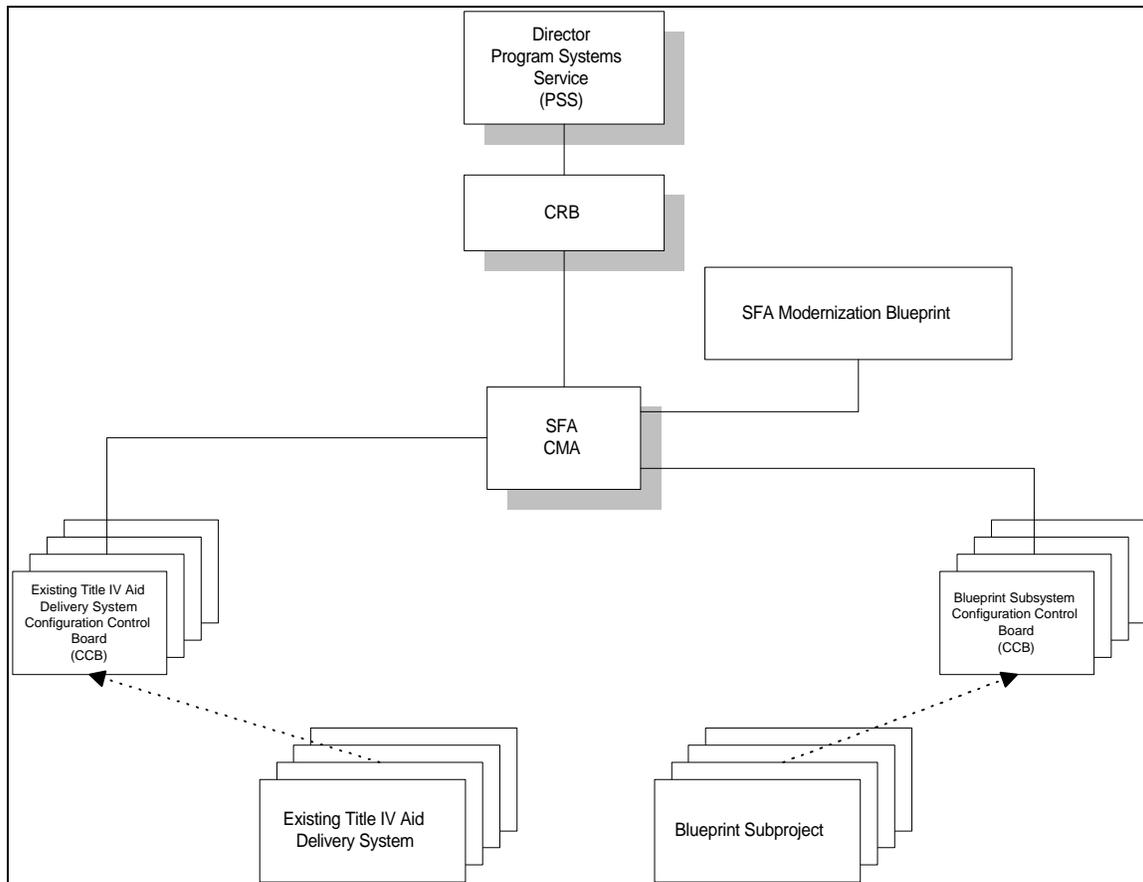


Figure C-10: SFA Configuration Management Organizational Structure.

The CRB, chaired by the Director of PSS, is the main decision board that has the authority and responsibility to review, question, and ultimately approve or disapprove CRs that impact SFA. The CRB reviews CRs from the current Title IV systems, Blueprint, and any Blueprint subprojects.

The CMA is the main administrative body of the SFA CM organization. The CMA controls SFA configuration identification, configuration control, configuration status accounting, and configuration auditing. The CMA, under the leadership of the SFA configuration manager, also serves a CCB function for SFA Class II CRs. The CMA's primary responsibility is to coordinate and summarize the impact analyses of all SFA Class I CRs, and Class I CRs approved by Blueprint subproject CCBs or approved by current Title IV system CCBs. Figure C-11 illustrates the basic relationship between the CRB, CMA, and the CCB.

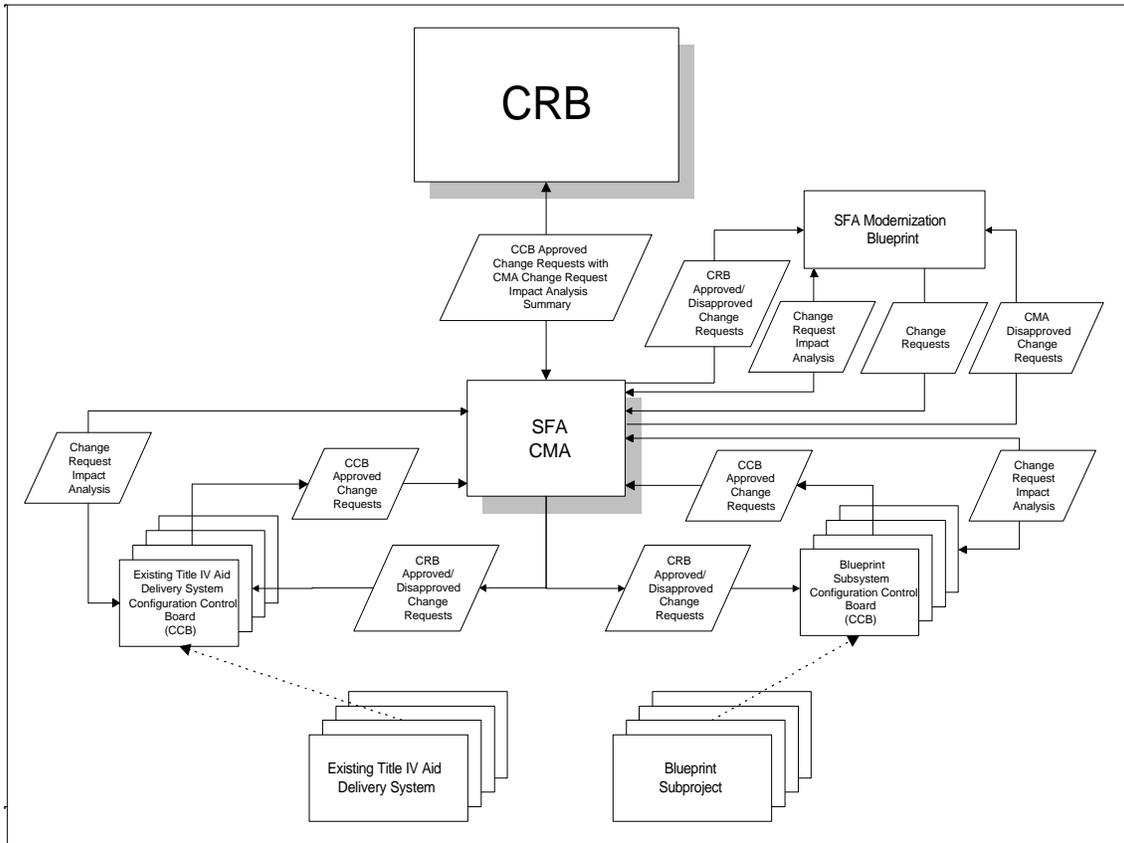


Figure C-11: SFA CRB, CMA, and CCB Relationships.

The CRB and CMA function independently of all Title IV systems and Blueprint subprojects. This independence will help to ensure that the SFA CM processes and procedures are not unduly influenced by the priorities of any single participating Title IV system or Blueprint subproject.

C.4.2.2 CM Organizational Responsibilities

The SFA CM organization is responsible for:

- Establishing and maintaining configuration control over SFA documentation, hardware, software, and all their related items.
- Augmenting the configuration control of CIs within the current Title IV systems and Blueprint subprojects that affect the design, development, implementation, and/or operation of SFA.

C.4.2.3 SFA Configuration Management Administration

The SFA CMA is responsible for implementing, controlling, operating, and maintaining all aspects of CM and CM administration for SFA. CMA responsibilities include:

- Establish, document, monitor, and amend the procedures for the CMA and CRB.
- Design, develop, implement, operate, maintain, and enhance the automated SFA project-wide CM tool.
- Coordinate, execute, and report on configuration audits as described in Section 6 of the *CM Plan*.
- Develop, coordinate, and implement all CM training courses and materials.
- Provide all required CM information to support the SFA integration activities, the configuration manager, and related boards in performing their CM responsibilities.

The CMA will coordinate the impact analysis of all SFA Class I Change Requests (CRs), and CCB-approved Class I CRs for Blueprint subprojects as well as for the current Title IV systems. If the impact analysis shows that external CIs are impacted by a Class I CR, the CMA will:

- Develop a summary impact analysis statement.
- Forward the CR and the impact analysis summary to the CRB for review and approval or disapproval.
- After the CRB decision, the CMA will notify the originator and all impacted parties of the CRB decision. If the CRB decision is a disapproval, the CMA will provide the CRB disapproval rationale.

Decisions regarding Class I CRs will be made by the CRB. The CMA will document the CRB results and facilitate the transmission of CRB results to SFA managers, Blueprint subproject managers, and/or Title IV system managers.

The CMA initially will comprise the following staff:

- SFA configuration manager;
- configuration librarian; and
- CM operations analysts (as needed).

In addition, representatives of SFA, of Blueprint subprojects, and the current Title IV systems will be required to support the CMA in conducting impact analyses of Class I CRs. Specific roles and responsibilities within the CMA are described in the following paragraphs.

The SFA configuration manager is responsible for:

- Supervising and controlling all SFA CM activities (i.e., configuration identification, configuration control, configuration status accounting, configuration auditing).
- Managing the CMA in the day-to-day performance of their duties.
- Ensuring that the CM processes and procedures defined in the *Project EASI/ED CM Plan* are appropriately implemented and operated
- Ensuring that the *CM Plan* is updated at key life cycle milestones and as required to maintain sound CM discipline on the project.
- Serving as a member of the CRB.
- Providing guidance to CM staff on Blueprint subprojects.

- Facilitating communication with other Title IV system managers regarding CM issues.

The CM librarian is responsible for:

- The initial set up of the CM tool, tailored to SFA.
- Developing and delivering training.
- Initially populating CM tool with past CIs.
- Monitoring incoming CIs as they are identified.
- Monitoring incoming CRs.
- Supporting CCBs use of the CM tool.
- Participating in configuration audits.
- Performing backup and recovery of the CM tool database.

CM operations analysts are responsible for:

- The initial set up of the CM tool, tailored to SFA.
- Supporting the CRB by generating reports, taking notes, tracking results, and notifying other configuration managers of results.
- Supporting SFA CI and CR processes and procedures.
- Helping coordinate impact analyses.
- Synthesizing impact information into summary impact analysis.
- Participating in configuration audits

C.4.2.4 Configuration Control Boards

Each Blueprint subproject will have a CCB and a corresponding CM organization. Each of the Blueprint subprojects will, within 30 days of subproject kick-off:

- Attend all required CM training as outlined in Section 7 of the *CM Plan*.
- Determine the appropriate CCB size and composition based on the anticipated number of CIs, the number and frequency of deliverables, and the availability and skill set of staff needed to ensure complete and timely execution of the CM responsibilities detailed in the *CM Plan*.
- Establish and document their own set of operating procedures to ensure the complete and timely execution of all CM and CCB responsibilities.
- Present the documented procedures to the SFA project manager and the SFA integration manager for review, comment, and approval.
- Establish the subproject CCB.

Each CCB will:

- Provide all CM managerial and administrative support necessary to the subproject, CRB, CMA, and other CCBs in order to ensure the execution of and compliance with the processes and procedures outlined in the *CM Plan* for each of the four major CM activities.
- Be responsible for loading, maintaining, and tracking all CI information for their subproject in the SFA automated CM tool.

- Review all CRs within the subproject and approve or disapprove those CRs.
- At a minimum of once a week, submit all approved Class I CRs to the SFA CMA for further evaluation and CRB review.
- Support CMA impact analyses of other Class I CRs.
- Appear before the CRB, or arrange for appropriate staff to appear before the CRB, to provide subject matter expertise.
- Ensure that no action is taken on CCB-approved Class I CRs prior to CRB approval.
- Monitor and ensure that all changes from all approved CRs for the subproject are completed according to the approved CR.

Each subproject will have the following CM staff:

- subproject configuration manager;
- subproject CM librarian; and
- subproject CM operations analysts (as required).

These staff will fulfill comparable roles to those defined for the CMA staff, but at the subproject level.

Subproject CCBs will comprise the following minimum staff requirements:

- subproject manager;
- subproject configuration manager;
- subproject development manager (if applicable);
- subproject operations manager (if applicable);
- ED management representative(s); and
- SFA integrator representative.

Other staff may be identified as permanent members of the subproject CCB, or may be requested to participate in specific CCB meetings as required to explain and fully discuss specific CM issues and CRs.

For ED's current Title IV systems, the existing Title IV system CCBs will continue to function in compliance with their respective processes and procedures as outlined in their respective CM plans. In addition, each of these CCBs will:

- Provide all approved Class I CRs to the CRB, via the SFA CMA, for review once a week, at a minimum.
- Ensure that no action is taken on CCB-approved Class I CRs prior to the CRB's approval.
- Support the CRB, the SFA CMA, and other CCB CM activities related to determine the impacts of CRs.

C.4.2.5 Change Review Board

The CRB is the governing board for the SFA CM. The CRB is chaired by the Director of PSS, who is responsible for making final decisions regarding SFA CRs, Blueprint subproject Class I CRs, and Class I CRs for the current Title IV systems. The CRB is supported by the SFA CMA. It provides administrative support and facilitates communication of CRB directions and decisions.

The CRB comprises the following staff, at a minimum:

- Director of Program Systems Service (CRB Chairman);
- SFA project manager;
- SFA integration manager;
- SFA configuration manager;
- Title IV systems project managers or configuration managers (as appropriate); and
- a scribe.

Specific roles and responsibilities within the CRB are described in the following paragraphs.

The Director of PSS (CRB Chairman) is responsible for:

- Leading CRB meetings (or delegating this responsibility to another CRB member).
- Making final decisions regarding approval or disapproval of Class I CRs and of SFA Class 2 CRs.
- Reviewing the results of SFA configuration audits.
- Reviewing appeals to the CRB regarding previous decisions on specific CRs.

The SFA project manager is responsible for:

- Participating in the CRB as the senior ED representative of SFA and all of its subprojects.
- Providing specific functional, management, and/or technical insight in discussions regarding SFA CRs and regarding the potential impact of Title IV system CRs on SFA.

The SFA integration manager is responsible for:

- Providing detailed technical insight and overall management insight into the potential impact of Blueprint subproject CRs and Title IV system CRs on SFA as a whole.
- Explaining specific aspects of SFA Class I CRs.
- Facilitating the CRB meetings at the CRB chair's request.

The SFA configuration manager is responsible for:

- Providing insight into SFA CM practices and procedures as they relate to information presented to the CRB.
- Providing insight into the status of CMA activities as they pertain to the CRB.
- Presenting CM audit results to the CRB and responding to CRB questions regarding these results.

Title IV systems project managers or configuration managers may be appointed as permanent members of the CRB or may be requested to attend only those meetings in which their respective systems are clearly involved. Title IV managers participating in the CRB are responsible for:

- Providing specific technical and management insight into the Class I CRs for their respective systems.
- Providing specific technical and management insight into the impact of Class I CRs from other Title IV systems, Blueprint, or Blueprint subprojects.

- Presenting appeals to previous CRB decisions regarding Class I CRs for their respective systems.

The scribe is a member of the SFA CMA, and is responsible for:

- Taking notes and documenting the results of the CRB meetings in formal minutes.
- Ensuring that the approved notes are distributed promptly to all involved system and subproject managers.

C.4.3 Contractor and Vendor Configuration Management Control

This section describes the methods used to ensure contractor/subcontractor compliance with CM requirements. It also describes the CM controls that apply to vendors. For purposes of the *CM Plan* the following definitions apply:

- **Contractor/Subcontractor** - any company, government agency or organization, private agency, or individual awarded or hired to perform or support the development/operation of deliverables/products as a Blueprint subproject.
- **Vendor** - a supplier of COTS software products or hardware that will be used to support the development or operation of SFA.

C.4.3.1 Contractor/Subcontractor Requirements

Each contractor/subcontractor providing services to SFA is required to comply with the *Project EASI/ED CM Plan*. The contractor/subcontractor will:

- Develop a CM plan documenting in detail their CM processes and procedures.
- Use the SFA-authorized CM tools and the centralized data repository to establish and administer CM for their particular tasking.
- Establish a CCB, as described in Section 2 of the *CM Plan*, within 30 days of subproject initiation. In the event that the contractor/subcontractor is unable to meet the 30 day requirement, a waiver request will be submitted to the SFA configuration manager within 15 days of subproject initiation, outlining an alternative implementation schedule for the CCB.
- Have all staff complete appropriate CM training, as described in Section 7 of the *CM Plan*, within 30 days of subproject initiation. In the event that the contractor/subcontractor is unable to meet the 30 day requirement, a waiver request will be submitted to the SFA configuration manager within 15 days of subproject initiation, outlining an alternative implementation schedule for training.
- Use the configuration item identification schema when assigning CI numbers to CIs.
- Incorporate the system, subsystem, and individual CI life cycle reviews and baselines detailed in the *CM Plan* into the subproject CM plan.
- Use the CR classification schema when developing CRs.
- Define subproject CM processes and procedures so that the CR review and approval process and procedures in the *Project EASI/ED CM Plan* are maintained.
- Recognize the CM organizational components and hierarchy established in Section 2 of the *CM Plan*.

C.4.3.2 Vendor Configuration Management Controls

Vendor products will be put under configuration control within SFA. Vendor products will be:

- Inspected at delivery to ensure that the products delivered meet the specifications of the purchase agreement and the requirements of their intended operating environment.
- Logged into the CM library and assigned a CI number before the end of the construction phase.
- Part of the subproject test baseline that is established at the end of the construction phase.
- Tested as part of subproject unit and system tests.
- Part of the product and production baselines.

In addition to logging the product into the SFA CM library, the owner of the product will also fill out all warranty and proof-of-purchase cards and ensure that they are returned to the vendor/manufacturer. This will help ensure that the SFA owner of the vendor product is notified regarding product upgrades and new version releases.

C.5 System Development Life Cycle Methodology

A system development life cycle methodology (SDLCM) consists of a number of activities. This section discusses the major activities or stages of the SFA's implemented SDLCM, referred to as the ED/System Life-Cycle Development Methodology (ED/SLCDM). Within the narrative, the term "release" refers to either new or enhanced systems capability. The ED/SLCDM stages are presented in the *ED/SLCDM Handbook Release 1.0* document, which introduces Andersen Consulting's METHOD/1 SDLCM as implemented for SFA.

The following subsections describe the ED/SLCDM stages and the relationship of SDLCM with other Framework elements:

- Subsection C.5.1 Plan
- Subsection C.5.2 Analyze
- Subsection C.5.3 Design
- Subsection C.5.4 Build
- Subsection C.5.5 Test
- Subsection C.5.6 Roll Out
- Subsection C.5.7 Evolve
- Subsection C.5.8 Manage
- Subsection C.5.9 Relationship with other Framework Elements

C.5.1 Plan

The Plan stage encompasses activities that are performed at an enterprise level. The activities of the stage act upon identified business and technology changes and specific requests for the enhancement of implemented application systems. The management processes of change, investment, and acquisition address specifically how SFA expects to identify and implement information system changes.

During the Plan stage, business requirements are defined at a low enough level that enables the preparation of meaningful IT Funding Requests and the subsequent preparation of RFPs and contracts for products and services to satisfy the requirements.

Plan stage activities typically include:

- Identify and define information technology needs
- Develop business case
- Evaluate and prioritize business needs
- Develop and evaluate proof of concept/prototype
- Review and prioritize enterprise needs
- Prepare system conceptual design & estimates

C.5.2 Analyze

After an IT Funding Request is approved and a contract is awarded for the delivery software products and services, the business requirements need to be confirmed, refined, and analyzed.

A team of both assigned users and information technology experts performs the Analyze stage activities. The team reviews the previously defined release requirements and, working with business and IT subject matter experts, develops process, data, and technology models that

represent the refined understanding of the release requirements. The models are used to capture and validate the requirements and, once approved, are then used to communicate expected capabilities to be designed and implemented.

During the Analyze stage, specific strategies and plans are developed to give direction to subsequent activities such as managing the project, providing periodic progress reports, evaluating the provided products and services, converting or migrating to the new system release, and managing and tracking the contractual relationships between SFA and vendors.

Analyze stage activities typically include:

- Identify and analyze business requirements
- Identify and analyze quality requirements
- Procure software development resources
- Define system development approach
- Create event, process, data, and user interaction models
- Develop test strategy and product test plan
- Develop conversion strategy and plan

C.5.3 Design

Design stage activities focus on the transformation of release models into component specifications that are used to generate the application code required by the system. Release components include reusable components and specialized, non-reusable programs. User community representatives review the component specifications to ensure that the designed systems capability satisfies defined business requirements.

Additionally, Design stage activities prepare testing strategies and plans for the components and defined assemblies (i.e., combinations of components). The test plans include test cycles, test conditions, and expected results.

Design stage activities typically include:

- Design system architecture
- Define system component standards
- Design system components
- Design logical & physical databases
- Develop assembly & component test plan

C.5.4 Build

The Build stage includes activities that convert component specifications into operational software. The components and assemblies of the release are created manually by programmers or are generated automatically by using tools such as Sterling's COOL:Gen. After the components and programs are created, they are tested individually and then combined and tested as assemblies.

During the Build stage, the project team develops and updates user procedures and manuals, using the component specifications as a basis. The team also develops the User Training plan and prepares training materials such as Instructor Guides and Participant Guide.

At the end of the Build stage, the fully tested and operational system components and the user procedures and manuals are ready to be used as an integrated system.

Build stage activities typically include:

- Construct and test components
- Prepare and conduct assembly test
- Prepare user procedures and manuals
- Prepare user training plan and curriculum

C.5.5 Test

During the Test stage, the project test team combines all components of the release and exercises them in varied combinations. These combinations are built through the incremental integration of release components verified through the use of test conditions and prepared test data, coupled with expected results. This approach is used to ensure thorough testing of all event/process pairings and to verify the correct processing of assemblies and components before live production.

Testing activities are focused on the system as a whole and are performed in a production type of environment. Different types of tests that are typically performed include:

- **Special Assembly or String Tests** - assembled components that are tested together with an emphasis on the processing and interaction of critical components; this testing is performed in addition to assembly testing completed during the Build stage.
- **Integrated Functional Testing** - assembled components that support specific business functions and processes are tested together to ensure that the requirements of the business functions are satisfied.
- **Performance/Stress Testing** - critical release processes are tested and tuned to ensure that the systems processing capabilities are accurate and timely for different volumes of transactions; testing includes system response times for processing that involves user interaction and the time required for batch processing of the information.
- **Acceptance Testing** - release functionality is exercised as it is expected to be used by the users in achieving business objectives and performing related tasks; testing is accomplished by defining and executing life cycles consisting of a logical series of events paired with processes performed in response to the events. Typically users are involved in planning and performing acceptance testing activities.

Additionally, during the Test stage, users are trained in the use of the release. Training courses, designed during the Build stage, are conducted for different groups of users, ensuring that the users are familiar with and able to use the processes of the releases.

Test stage activities typically include:

- Prepare production test environment
- Prepare and conduct product test
- Conduct user training

C.5.6 Roll Out

After a new release (i.e., software capabilities) is tested and accepted by the users, the software is implemented in the production environment and required data conversion tasks are performed. During the Planning stage of the project, a strategy is defined for rolling out the software to the user community. The strategy could indicate that before the software is rolled out to all users, a pilot test is performed to ensure that the software satisfies business requirements in a live environment.

The Roll Out stage is the final major activity performed by a project prior to turning over a new release to operations. Therefore, the stage includes activities that confirm whether expected benefits are realized. In addition, a final project report is generally prepared that documents the activities of the project, the degree to which original business requirements have been satisfied, lessons learned, and other relevant information about the project.

Even though responsibility for a release has been transferred to the system operations group, the project team may continue to have an ongoing involvement with a release until certain milestones have been achieved. For example, the project team could be involved in the first month-end processing cycle and be part of other processing cycles and activities until specific volumes of transaction processing are satisfactorily achieved.

Roll Out stage activities typically include:

- Prepare production environment
- Conduct pilot test
- Convert to new system
- Conduct benefits realization test

C.5.7 Evolve

Once a release has been rolled out to the user community, the release is periodically reviewed to determine if it is performing satisfactorily, if it is effective in serving the users' needs, and if it meets the original business requirements. Depending upon the outcome of these assessments, problem areas are evaluated and potential improvements or change requests are recommended.

The frequency of the operational reviews is determined by the critical business nature of the processes supported by the release and the volume of transactions handled by the processes.

C.5.8 Manage

The Manage stage is a cross-life cycle activity that accounts for multiple management processes and the associated deliverables. The SFA policies and procedures that govern information technology identify specific project management activities that need to be performed and their related deliverables. The activities and deliverables may vary depending upon the complexity and level of risk of the release being prepared by the project.

Generally, during the Plan stage, Manage stage activities develop strategies and plans that are used to guide the other stages of a project. During the other stages, the key Manage stage activities are to monitor, control, and evaluate project progress and to prepare required periodic progress reports.

Though the SDLCM is the key element of the framework, it is managed by and interacts with other management processes such as Architecture, Change, Investment, Acquisition, and Configuration. The Plan and Manage stages are responsible for majority of the interactions with these processes.

C.5.9 Relationship with other Framework Elements

In Table C-12, a high-level perspective is presented regarding the relationship that the SDLCM Element has with other Elements of the Framework.

Element	Relationship Comments
Architecture Management	<ul style="list-style-type: none"> • Proposed system improvements are expected to be developed within the SFA Modernization Blueprint, ensuring compatibility with existing and future systems. Plan, Analyze, and Design stage activities observe blueprint standards and expectations, resulting in Construct and Test stage deliverables that are compatible with the blueprint. • The dimensions of architecture management are Development, Administration, Assessment and Maintenance. The Plan and Analyze stages, consisting of information planning, project definition, and requirements definition parallels Development. The Design and Construct stages provide feedback and receive input through project management in conjunction with Administration. The Evolve stage and Assessment activities support learning about successes and needed architecture improvements from the implemented systems. Through the project management activities and Evolve stage activities, proposed architecture refinements are acted upon by Maintenance activities. • During the life of a project, project management, a cross-stage process, provides checkpoints to ensure that a project adheres to the defined SFA Modernization Blueprint. As potential refinements and exceptions are identified, the proposed blueprint changes are accumulated and eventually become a systems project.
Change Management	<ul style="list-style-type: none"> • The Plan stage of the SDLCM considers the existing technology environment and, depending upon business and technology changes, identifies what changes (e.g., new business strategies, changes in available information technologies, etc.) will be addressed. Change management activities include the formulation, communication, evaluation, and coordination of new initiatives. • Project management, a cross-stage activity, is the interface point of SDLCM with change management during the life of a systems project. Through this process, project status reports are prepared and adjustments are made to the project, ensuring that change management objectives and strategies are satisfied.

Table C-12: SDLCM Relationship with Other Framework Elements

Element	Relationship Comments
Investment Management	<ul style="list-style-type: none"> • The Plan stage of the SDLCM considers the existing technology environment and, depending upon business and technology changes, identifies how changes (e.g., new business strategies, changes in available information technologies, etc.) will be addressed. Investment management activities include the selection and prioritization of initiatives, the oversight of the portfolio of prioritized initiatives, and the evaluation of completed initiatives. • Project management, a cross-stage activity, is the interface point of SDLCM with investment management during the life of a systems project. Through this process, project status reports are prepared and adjustments are made to the project, ensuring that investment management objectives and strategies are satisfied.
Acquisition Management / SA-CMM	<ul style="list-style-type: none"> • During the Plan and Analyze stages of the SDLCM, activities are performed that result in identifying system components that need to be created, upgraded or replaced. The objectives and strategies of acquisition management guide the planning activities. • In addition to being a source of procedural direction for acquiring and developing systems, acquisition management has a parallel relationship with the project management process of the SDLCM. Through project management, project status reports are prepared and adjustments are made to the project, ensuring that acquisition management objectives and strategies are satisfied.
Configuration Management	<ul style="list-style-type: none"> • The SDLCM has a parallel relationship with configuration management through project management. Configuration management objectives and strategies guide the project management activities that 1) prepare and manage the system development environment and that 2) ensure the integrity of system components and documentation by controlling change. • Though interaction with project management exists throughout the life of a project, a close interaction exists between the Build, Test, Roll Out, and Evolve stages a project.
Technology Tools	<ul style="list-style-type: none"> • Technology Tools are categorized as either supporting both planning and design or both construction and maintenance. For example, Sterling COOL: Biz tools can be used to construct models, decomposition diagrams, etc. that are used as SDLCM deliverables. Sterling COOL: Gen, in addition to having some modeling capabilities, can be used to construct executable application components and create database objects. • Through the defined set of deliverables of the Analyze, Design and Build stages, the SDLCM guides which technology tools can be used to prepare the deliverables.

Table C-12: SDLCM Relationship with Other Framework Elements, continued