United States Department of the Interior

IT CPIC Guide

Information Technology
Capital Planning and Investment Control

February 2005 Final

OFFICE OF THE CHIEF INFORMATION OFFICER

Version Control Log

Date	Version #	Author	Description
12/2002	1	OCIO/PMD	Original version
12/2004	2 - Draft	OCIO/PMD	Updated to include: Quarterly Reporting, Operational Analysis, ITIM Assessment, ITMC & IRB Charter updates
12/22/2004	2.0 –Draft	C. Anderson	Updated to reflect, ITMC, IRB and CPWT comments.
12/27/2004	2.0 - Draft	S. Gellenthien	Updated to reflect Monthly Scorecards and other Scorecard input.
12/29/2004	2.0 – Draft	C. Anderson	Updated to reflect, PMD and OCIO comments.
12/30/2004	2.0 - Draft	S. Gellenthien	Updated Quarterly and Monthly Scorecards and supporting instructions in Appendix M.
01/03/2005	2.0 – Draft	C. Anderson	Updated to reflect Architecture Input
01/04/2005	2.0 – Draft	C. Anderson	Updated to reflect PM Input

Updates to this document: The Department of the Interior recognizes that the CPIC process and this Guide are going through continuous change and process improvement. Changes and improvements to the CPIC process and this Guide come from their interdependence on other processes and best practices, including Interior's change control management (CCM) process, project management process (and best practices) and an integrated life cycle process. As Interior matures, the CPIC process and the other interdependent processes will become better defined and aligned.

If you would like to make a suggestion for enhancement, please send an email or written memo to the OCIO PMD. Please be very specific with your recommendation and include the section, paragraph and page number in your note. Subsequent changes will be vetted through the PMD Chief and the Capital Planning Working Team (CPWT) and final approval will rest with the DOI IRB.

For further information on IT investment management or DOI's CPIC process, please contact the Chief of the Portfolio Management Division (PMD), in the OCIO at either (202) 208-4109 or email OCIO CPIC Working Team at OS_PIO_CPIC@ios.doi.gov.

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Executive Summary

Information Technology Capital Planning and Investment Control (CPIC) Guide

The Key Components

Recognizing both the importance of IT investments (or projects) to the organization and its role in supporting the success of these investments, the Office of the Chief Information Officer (OCIO) is engaged in an ongoing effort to establish, maintain, and support an IT investment analysis and decision-making environment. This environment consists of three key components:

Executive decision-makers: Consists primarily of the Secretary, and the DOI CIO as her delegated authority, assisted by the Investment Review Board (IRB) and executive working groups appointed by the IRB. The IRB oversees the process and are stakeholders in the success of DOI's CPIC.

Staff or Tools: DOI uses a variety of tools to manage its IT investments. Adequate staff resources are allocated to support the processes and a Capital Planning Working Team (CPWT) to provide collaboration between the Bureau's, Offices, and the Department to ensure the CPIC process is kept up to date and relevant.

Processes: Capital Planning and Investment Control (CPIC) is DOI's primary process for: (1) making decisions about which initiatives and systems DOI should invest in, and (2) creating and analyzing the associated rationale for these investments.

This Guide

The *DOI Information Technology Capital Planning and Investment Control Guide* identifies the processes and activities necessary to ensure DOI's investments in IT are well thought out, cost-effective, and support the missions and business goals of the organization. It is based on guidance from both the Office of Management and Budget (OMB) and the Government Accountability Office (GAO).

At the highest level, the CPIC process is a circular flow of DOI's IT investments through five sequential phases. As shown in **Figure ES-1**, these phases are:

Pre-Select Phase: Business specialist proposes IT investments. Executive decision-makers assess each proposed investment's support of DOI's strategic and mission needs, and then select promising investments for further analysis.

Select Phase: Investment analyses are conducted and the IRB chooses the IT investments that best support the mission of the organization, support DOI's approach to enterprise architecture, and exhibit project management.

Control Phase: Through timely oversight, quality control, and executive review, DOI ensures that IT initiatives are executed or developed in a disciplined, well-managed, and consistent manner.

Evaluate Phase: Actual results of the implemented projects are compared to expectations to assess investment performance. This is done to assess the investment's impact on mission performance, identify any investment changes or modifications that may be needed, and revise the investment management process based on lessons learned.

Steady State Phase: Mature systems are assessed to ascertain their continued effectiveness in supporting mission requirements, evaluated for the cost of continued maintenance support, assessed for potential technology opportunities, and considered for retirement or replacement options.

Each of these five phases is structured in a similar manner using a set of common elements. These common elements provide a consistent and predictable flow and coordination of activities within each phase.

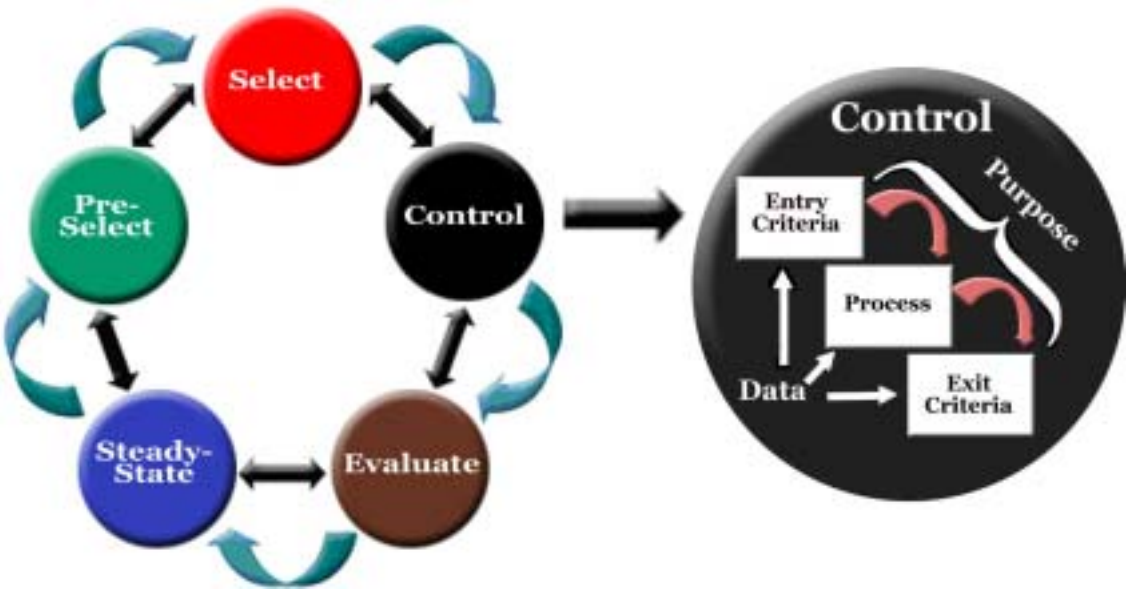


***Figure ES-1**. The Five CPIC Phases and the Common Elements within Each Phase*

Beyond the detailed CPIC process and activity description, this Guide also includes:

A charter for the IRB and the associated operating procedures necessary to conduct investment reviews. The DOI Investment Review Board (IRB) charter can be found at the following website; http://www.doi.gov/ocio/itmc/IRB_charter.pdf

A charter for the Information Technology Management Council (ITMC) and the associated operating procedures necessary to manage the IT

investment portfolio can be found at the following website: http://www.doi.gov/ocio/itmc/itmc_charter.pdf

A charter for the CPWT and the associated purpose and goals can be found on the U. S. Department of the Interior - OCIO - IT Capital Planning web-site.

A template for evaluating the mission need of a new IT investment

Guidance on how to:

- Complete a Cost-Benefit Analysis (CBA)
- Conduct risk management for IT capital planning
- Develop performance measures for IT investments
- Manage IT investments
- Conduct earned value analysis
- Conduct a Post-Implementation Review (PIR)

The scoring criteria to be used by the executive working groups and IRB during investment reviews

A glossary of terms and acronyms used throughout this document

A list of references used to create this document.

DOI will implement policy and processes contained in this guide. Each DOI Bureau will adhere to the same policy and processes, making modifications as appropriate. Evaluation of compliance to these processes will be conducted annually in order to ensure the entire DOI is following the CPIC guidance.

Strategic and Performance Planning

GPRA requires Federal agencies to develop strategic plans, develop annual performance plans that are tied to the Department goals and budget allocation, and report the actual results against performance plans. DOI develops and maintains a DOI-wide Strategic Plan that addresses DOI's mission, goals, and objectives, relationship of the goals and objectives to annual performance plans, and factors affecting achievement of business goals or objectives. The IT Capital Planning and Investment Control process attempts to link all IT investments to the strategic goals of the Department. The Exhibit 300 business case for each IT investment must identify its linkage to the Department's mission, goals, and objectives, and address how it will enable and facilitate the achievement of the strategic goals and objectives. Investments that do not support a DOI goal, or cannot be directly tied to a goal, should be re-evaluated.

A DOI Annual Performance Plan is combined with the accountability report and is issued annually as the "Performance and Accountability Report". It is developed to identify the major performance goals for the Department. Each performance goal establishes a current baseline (a reference position) from

which progress is measured consistent with the DOI strategic plan objectives and tied to the Federal Enterprise Architecture (FEA) Performance Reference Model (PRM). The plan includes a goal that measures the extent to which IT investments are maintained within 5% of their planned cost and schedule. The data to measure this performance is derived from the IT Capital Planning and Investment Control process. In effect, the Annual Performance Plan is the culmination of the results of the performance of DOI's capital investments as tied to the Strategic Plan.

DOI's IT Investment Management Philosophy

IT Strategic Plan

The Department's IT management philosophy is based on its IT Strategic Plan, which sets the following five tenets of strategic IT investment:

1. IT investments should be managed as a portfolio;
2. Each IT investment should be justified and demonstrate benefit to DOI's mission;
3. The portfolio should strive to balance investments so that strategic infrastructure and IT investments supporting DOI programs are in harmony;
4. The process used to select, control, and evaluate investments should be integrated with Bureau and Department processes for budget, financial, and program decisions; and
5. Bureau and Department managers (project sponsors) are responsible and accountable for management of respective IT investments.

Interior's IT Strategic plan has two primary components:

- An E-Gov Strategy that includes a mission and vision with underlying goals and objectives for the Department.
- A Governance Framework that provides a process for management and oversight of the Department's IT investment portfolio.

Copies of both of these documents can be found at the following web-site:

- http://www.doi.gov/e-government/

This *Guide* has been developed in support of these principles.

Enterprise Architecture (EA)

Departments are required to establish an integrated Enterprise Architecture (EA), which is tied to the Federal Enterprise Architecture (FEA.) IT Investment Management, as illustrated in Figure ES-2, covers the three interrelated processes, as required by Federal statutory requirements, regulations, and guidance for both IT Capital Planning and Investment Control process and Enterprise Architecture.

The Interior Enterprise Architecture (IEA) reference models conform to those of the Federal Enterprise Architecture (FEA) and are supported by several architecture teams, both at the Department level and at the Bureau or Office level. The DOI Enterprise Architecture Repository (DEAR) is a systems inventory and the primary tool used in the development of the modernization blueprints. The Bureau Enterprise Architecture Repository (BEAR) is the systems inventory for the individual Bureau level architecture management of Bureau unique business requirements and is also considered to be a portion of the "integrated DOI EA".

CPIC and IT Investment Management Improvement

As part of the IT CPIC process, the Department has instituted an IT Investment Management improvement effort based on the Government Accountability Office's (GAO) guidelines for IT Investment Management (ITIM) maturity framework. The recommendations of the "Departmental Leadership Crucial to Success of Investment Reforms at Interior" report (GAO-03-1028) will be incorporated in successive iterations of this CPIC Guide. The objective is to establish a Department-wide IT portfolio managed by the OCIO, composed of functional or Bureau portfolios, including equipment, services, applications, staff, and managers. DOI's portfolio will be effectively managed to change as new IT initiatives are added, new technology is introduced, or new policy is implemented, while still remaining true to the Department's overall mission. As a result, project managers, project sponsors, and system managers will be guided by one all-encompassing process with well-defined sub-processes, following GAO's recommendations.

DOI's IT CPIC Process Overview

DOI's IT management is based on the fundamental phases of an IT CPIC process, as described by the Department's OIG, the OMB, the GAO, and Federal Chief Information Officers' (CIO) Council guidance. This guidance directs that investment control processes must include three essential phases; Select, Control, and Evaluate. Each phase is conducted as part of a continual interdependent management effort aimed at moving from a fixation on project-by-project focus to a bigger perspective on investment trends, directions, and outcomes. The CIO Council document, *Smart Practices in Capital Planning*, states: "Effective capital planning requires long range planning and a disciplined budget process as the basis for managing a portfolio of assets to achieve performance goals and objectives with minimal risks, lowest life cycle costs, and greatest benefits to the business." Best practices include a multi-tiered process to assure an optimal IT investment

portfolio. Each tier is empowered to make decisions and approvals through formal charters. Approval decisions may result in reallocating or requesting new funding, adding new investments, and postponing, or even canceling, investments.

The CPIC is a structured, integrated approach to managing IT investments. The CPIC ensures that IT investments align with the Department's mission and supports its business needs while minimizing risks and maximizing returns throughout the investment's life cycle. CPIC relies on systematic selection, control, and on-going evaluation processes to ensure that the investment's objectives are met efficiently and effectively. These continuous processes are depicted in **Figure ES-2: Information and Process Flow**. The information flows shown in Figure ES-2 also represent a feedback mechanism to institutionalize lessons learned. Approved major investments —Exhibit 300 Capital Asset Plan and Business Case (Exhibit 300 business case)—become part of a larger investment portfolio (Exhibit 53) maintained by the Office of Budget (POB). This portfolio contains an inventory of investments, as well as supporting strategic, technical, and financial information related to each investment's risk and return profile. This information will be reported annually to the OMB. When all IT investments are consolidated into the Department's portfolio, the OCIO can ensure that all systems support DOI's mission and goals, and work in concert with each when appropriate, including systems under development, systems currently in use, and systems scheduled for retirement and or replacement.

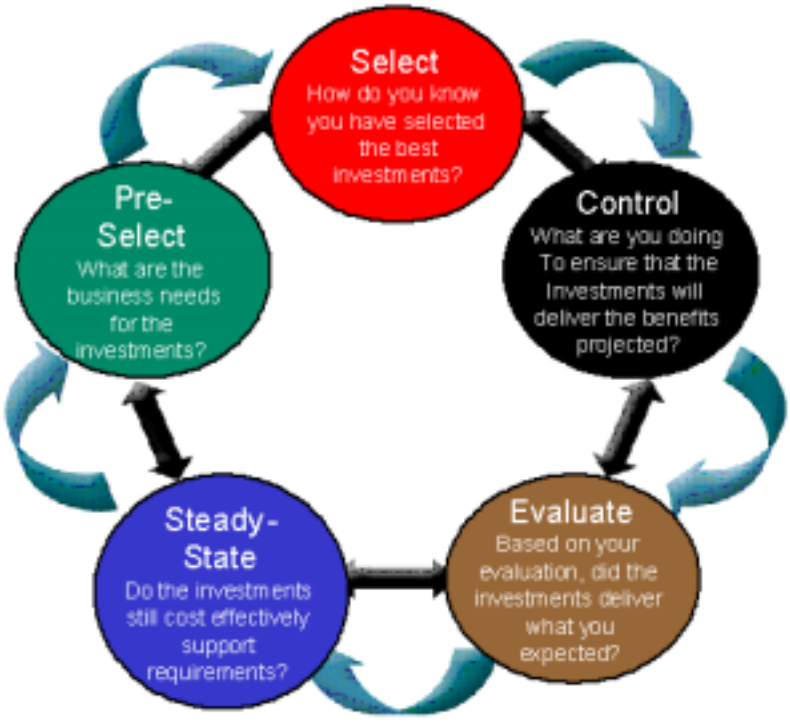


Figure ES-2: *Information and Process Flow*

CPIC and Other Management Processes

The Clinger Cohen Act, which governs the CPIC process, has three strong focus areas: capital planning and investment control, enterprise architecture, and the resources to accomplish both of these processes. To understand the role of IT capital planning within the IT management process, it is important to recognize its linkage with other Department planning and management processes. Below is a summary of linkages between the DOI IT Capital Planning and Investment Control process and related management processes and events, listed in the sequence in which they normally occur during an annual cycle.

CPIC and EA Alignment

Based on the FEA, DOI has developed an architecture framework as a logical structure for organizing complex information about an enterprise. This information includes the enterprise's business processes, participants, the hardware and software systems that support those processes and participants, and the rules and constraints under which the enterprise operates.

An architecture framework helps an enterprise organize and present aspects of its architecture in a way that is understandable by all participants in the enterprise and by those outside the enterprise with which they must interact.

The FEA enables the DOI EA to:

- Analyze business processes to take advantage of standardization based on common functions to customers.
- Ensure that automated systems optimally support the business processes and minimize the data collection burden.
- Acquire new systems and coordinate technology investments with the Federal business systems and architecture.
- Streamline organizational structure and distribution of responsibilities across the enterprise using Federal interoperability standards.
- Facilitate IT Capital Planning and Investment Control and coordinate FEA technology investments.
- Train employees in how the enterprise operates and how they fit into the enterprise.

An important role of the Department's CIO and its ITMC is to review the EA framework and identify redundant information that exists between investment information and the EA information, and bring that to the IRB for an investment review. For example, the Federal Enterprise Architecture Framework (FEAF) requires a list of business goals and strategies, business plan (objectives and strategies), list of organizations important to the business, and workflow model (allocation of responsibilities). The IT CPIC process also requires similar information. If the existing IT CPIC information is insufficient for use by the EA, a process for capturing and incorporating the more robust EA information must be developed.

EA is part of the Exhibit 300 business case criteria for the review and evaluation of investments through the IT CPIC process.

These following FEA frameworks provide a way of describing, analyzing, and improving the Federal Government information systems. All investments must include these criteria linking the investment to the Business Reference Model (BRM), Technical Reference Model (TRM), Service Reference Model (SRM), Data Reference Model (DRM), and Performance Reference Model (PRM):

Business Reference Model (BRM) is a function-driven framework that describes the Lines of Business and Internal Functions performed by the Federal government independent of the agencies that perform them. All IT investments (including non-major) are mapped to the BRM to identify collaboration opportunities.

Technical Reference Model (TRM) provides a framework to describe the standards, specifications, and technologies supporting the delivery, exchange, and construction of business (or Service) components and e-Gov solutions. The Federal TRM unifies existing Department TRMs and electronic Government guidance by providing a foundation to advance the re-use of technology and component services from a government-wide perspective.

Service Component Reference Model (SRM) provides a common framework and vocabulary for characterizing the IT and business components that collectively comprise an IT investment. The SRM will help agencies rapidly assemble IT solutions through the sharing and re-use of business and IT components. A component is a self-contained process, service, or IT capability with pre-determined functionality that may be exposed through a business or technology interface.

Data Reference Model (DRM) describes, at an aggregate level, the data and information that supports government program and business line operations. This model enables agencies to describe the types of interaction and exchanges that occur between the Federal Government and citizens.

Performance Reference Model (PRM) is a standardized framework to measure the performance of major IT investments and their contributions to program performance. This model helps produce enhanced performance information to improve strategic and daily decision-making; improves the alignment and better articulates the contribution of inputs to outputs and outcomes; and identifies performance improvement opportunities that span traditional organizational structures and boundaries.

IT Security

IT security is an explicit part of the IT CPIC process. All IT investments must demonstrate that costs for appropriate IT security controls are explicitly incorporated into the life cycle planning of a all systems in a manner consistent with FISMA and OMB guidance for IT investments. Cost effective security of DOI information systems must be an integral component of business operations.

IT security is part of the Exhibit 300 business case criteria for the review and evaluation of investments through the IT Capital Planning and Investment Control process.

Each business case should include costs associated with all aspects of security program expenses that would normally occur. For example: ongoing cyclical Certification and Accreditation (C&A), risk identification & mitigation activities, and day-to-day investment level security operations activities.

Budget Formulation and Execution

Annually, agencies are required to submit, in accordance with the requirements of OMB Circular A-11, IT investments as part of Interior's budget request. All IT investments are to be included in the Federal budget request whether they are existing investments and systems, incremental increases for existing investments and systems or new initiatives. During the budget process, the reasonableness of the cost estimates is examined and agencies are held accountable for meeting the cost goals. Alternative analyses are conducted for each IT investment. The selection of the best alternative is based on a Cost Benefit Analysis (CBA) that uses a systematic analysis of expected benefits and costs. Estimates of risk-adjusted costs and benefits show explicitly the performance, budget changes, and risks that result from undertaking the investment. DOI's IT CPIC process is closely aligned to DOI's budget cycle processes. This includes reviews by the respective controllers of the IT-related funding requests developed by the Bureaus and Departmental offices during the formal budget formulation process conducted by the controllers. All budget requests will be reviewed and prioritized based on projected budget requests. New investments are justified based on the need to fill a gap in DOI's ability to meet strategic goals and objectives with the least life cycle costs of all the various possible solutions, and provide risk-adjusted cost and schedule goals and measurable performance benefits.

Scope of CPIC

DOI's CPIC covers IT investments originating at the supporting offices of the component Bureaus to Department-wide systems originating in DOI level offices. All DOI IT investments are identified in the DOI IT portfolio (Exhibit 53). IT governance boards exist from lowest levels to highest management bodies. All IT investments (projects) meeting the minimum Bureau screening criteria must follow their respective CPIC. Departmental Offices must meet the minimum national screening criteria and must follow the Department's IT CPIC Process.

Key Decision Making Bodies — General Guidance

The following decision-making bodies are responsible for ensuring that proposed investments meet the Department's strategic, business, and technical objectives:

The DOI CIO, as the Secretary's delegated agent, makes the final decision based on the IRB's recommendation.

DOI Investment Review Board (IRB)

The Departmental-level IT governing body is the IRB. It is responsible for the following activities;

- Selecting, controlling, and evaluating all Information Technology investments included in the DOI portfolio.
- Defining the decision criteria that will be employed to select among IT investments for the DOI IT Investment Portfolio.
- Making technical decisions regarding the effective use of DOI IT investments and resources, including systems development, infrastructure, maintenance, and IT consulting.
- Reccomending, disapproving, or deferring judgment on the entire portfolio while also reserving the right to review each IT investment under consideration for, or already within, the DOI IT Investment Portfolio.

Requirements for Bureau Management Review Boards

Bureaus are required to establish and maintain active IT review boards modeled on the Departmental IRB. These boards are required as part of the Fiscal Year 2005 President's Budget Pre-Select and Select Phases. They will also be structured to conduct the Control, Evaluate, and Steady State monitoring activities. Specifically, Bureau review boards will be structured to the following additional activities:

- Review on-going IT investments to ensure that their status, progress, and outlook are satisfactory and consistent with project plans.
- Identify deficiencies in project management and monitor corrective actions.

- Provide recommendations to the ITMC to support their decision to continue, reduce, terminate, or defer IT investments.
- Conduct periodic reviews of investment status, control, performance, risk and outlook for approved and funded IT investments.
- Establish and execute the necessary project controls to manage requirements; risk; cost, schedule, and technical baselines; and performance outcomes.

1 Introduction

1.1 Purpose

This document describes the United States Department of the Interior (DOI) Information Technology (IT) Capital Planning and Investment Control (CPIC) process. It outlines a framework for DOI to manage its IT investment portfolio. This investment management process allows DOI to optimize the benefits of scarce IT resources, address the strategic needs of DOI, and comply with applicable laws and guidance.

The CPIC is a structured, integrated approach to managing IT investments. It ensures that all IT investments align with the DOI mission and support business needs while minimizing risks and maximizing returns throughout the investment's lifecycle. The CPIC relies on a systematic pre-selection, selection, control, and on-going evaluation process to ensure each investment's objectives support the business and mission needs of the Department (see **Figure 1-2**).

Through sound management of these investments, the Investment Review Board (IRB) makes recommendations regarding the IT direction for DOI, and ensures that bureaus and offices manage IT investments with the objective of maximizing return to the Department and achieving business goals.

1.2 Legislative Background and Associated Guidance

Seven statutes require Federal agencies to revise their operational and management practices to achieve greater mission efficiency and effectiveness. Include these laws:

- The Chief Financial Officer (CFO) Act of 1990
- The Government Performance and Results Act of 1993 (GPRA)
- The Federal Acquisition Streamlining Act of 1994 (FASA)
- The Paperwork Reduction Act of 1995 (PRA)
- The Clinger-Cohen Act of 1996 (CCA)
- The Government Paperwork Elimination Act of 1998 (GPEA)
- The Federal Information Security Management Act (FISMA)
- E-Gov Act of 2002

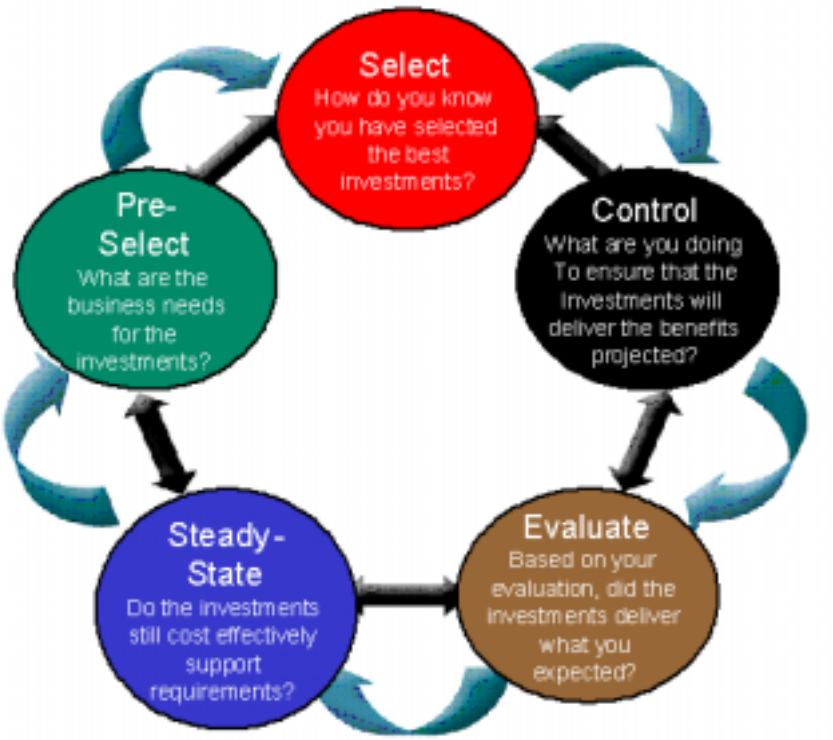


***Figure 1-2**. CPIC Information and Process Flow*

This CPIC Guide is based upon the IT aspects of these laws, and focuses specifically on the Clinger Cohen Act (CCA) requirements. The CCA's objective is that senior managers use a CPIC process to systemically maximize the benefits of IT investments. The CCA further describes CPIC as follows:

"The Head of each executive agency shall design and implement in the executive agency a process for maximizing the value and assessing and managing the risk of the information technology acquisitions of the executive agency," and

"The process shall:

1. Provide for the selection of information technology investments to be made by the executive agency, the management of such investments, and the evaluation of the results of such investments;
2. Be integrated with the processes for making budget, financial, and program management decisions within the executive agency;
3. Include minimum criteria to be applied in considering whether to undertake a particular investment in information systems, criteria related to the quantitatively expressed projected net risk-adjusted return on investment and specific quantitative and qualitative criteria for comparing and prioritizing alternative investments;

4. Provide for identifying information systems investments that would result in shared benefits or costs for other Federal agencies of State or local governments;
5. Require identification of quantifiable measurements for determining the net benefits and risks of a proposal investment; and
6. Provide the means for senior management to obtain timely information regarding the progress of an investment, including a system of milestones for measuring progress, on an independently verifiable basis, in terms of cost, capability of the system to meet specified requirements, timeliness, and quality."

Beyond the legislative background, there is extensive guidance from the Federal Chief Information Officer (CIO) Council, the Office of Management and Budget (OMB), the Government Accountability Office (GAO), and others in the area of IT investment management. A list of investment management reference guides and memoranda is identified in Appendix Q. The policy and processes described in this Guide are consistent with this guidance.

1.3 Point of Contact

The CPIC process is primarily supported and maintained by the DOI Office of the Chief Information Officer (OCIO). For further information about this Guide or the CPIC process, please contact the Chief, Portfolio Management Division (PMD) in the OCIO at either (202) 208-4109 or OCIO CPIC Working Team at OS_PIO_CPIC@ios.doi.gov.

1.4 Scope of CPIC

All Departmental IT system development, maintenance efforts, and infrastructure computing resources at all levels of sensitivity, whether owned and operated by DOI, or operated on behalf of DOI must comply with this CPIC guidance.

All IT investments must be reviewed and approved by the DOI IRB. It is expected that each individual DOI Bureau will have a similar CPIC process, manage its own portfolio, and create associated criteria. At a minimum, each Bureau is expected to use the CPIC process to manage its IT investments.

The criteria for an investment to be considered "major" are described in the following section.

Investments that are not considered "major" are classified as "non-major" and must have an Exhibit 300-1 business case submitted.

1.5 Criteria for Major IT Investments

Major IT systems meet at least one of the following criteria:

- Any investment that was reported to OMB the previous year as a major investment.
- $5M annual cost or > $35M lifecycle cost
- Importance to the mission or its significant role in administration of programs, finances, property, or other resources
- Is an integral part of the Department's modernization blueprint (EA)
- Mandated by legislation or executive order, or identified by the Secretary as critical
- All financial systems with an annual cost greater than $500,000.
- High risk as determined by OMB, GAO, Congress and or the CIO.
- Directly Supports the President's Management Agenda Items of "high executive visibility"
- E-Government, Departmental, cross-cutting (across more than one office or Bureau)
- Links to the first two layers of the FEA. (This is meant to imply the first two layers of the BRM: Services to Citizens and Mode of Delivery)
- These investments are considered to be strategic for the Department and have a greater documentation burden. Each is individually reported to OMB as an Exhibit 300 business case. These investments form part of the DOI IRB IT portfolio together with smaller investments from DOI Bureaus.

1.6 Roles and Responsibilities

The following decision-making bodies and personnel have been established.

Investment Review Board (IRB): The governing and approval bodies responsible for ensuring that proposed investments meet DOI strategic, business, and technical objectives and manages the overall IT portfolio. The IRB reviews, recommends decisions and issues guidance on the implementation of recommendations contained in Modernization Blueprints for information technology (IT) lines of business.

Budget Analyst: Official responsible for serving as the primary interface between the investment and the Budget Office.

Bureau or Office Chief Information Officer: Responsible for implementing Departmental policy, reviewing Bureau specific investments, and making recommendations to the Bureau or office IRB.

Capital Planning Coordinator: Official responsible for serving as the primary interface for capital planning between the investment and CIO is also a member of the Capital Planning Working Team (CPWT) that helps to shape and refine DOI's CPIC process.

Capital Planning Working Team: The mission of the CPWT is to enable and assist Bureaus and offices in IT capital planning and investment management. The mission is cooperative, inclusive of architecture, budget, security, financial, and other high priority DOI efforts.

Contracting Officer: Official responsible for serving as the primary acquisition support for the investment and interface between the investment and the Office of Acquisition and Property Management.

CPIC Sponsor: Responsible official for providing executive sponsorship of the investment; should be a senior level executive within the applicable mission area or office or Bureau.

DOI Chief Information Officer (CIO): Responsible for setting Departmental IT policy, reviewing all IT investments; and, as the chair of the IRB and Secretary's designated Information Technology (IT) manager makes final decisions regarding DOI IT investments.

DOI Office or Bureau Head: Responsible official for approving CPIC documentation before submission to OCIO.

Executive Working Group(s) (EWG): Responsible for assessing how well potential major investments meet a predetermined set of capital planning decision criteria and providing recommendations to the IRB. The IRB appoints Executive Working Groups as needed. (Examples; Architecture Review Board (ARB) or e-Gov team)

Project Manager: Trained or experienced official responsible for management and completion of one or more IT investment projects. (Reference DOI OCIO Directive 2004-019)

Project Sponsor or Functional Manager: Business official responsible for the strategic business processes under development or enhancement and for ensuring their integrity; also serves as the primary user interface to the CIO, EWG, and IRB.

Proponent: Individual or organization that proposes an IT investment to meet a mission or business need.

System Owner: Responsible for ensuring that the system is evaluated on an annual basis and receives an appropriate level of funding for the operations and maintenance of the system.

1.7 Process Overview

The CPIC is a structured process in which proposed and ongoing IT investments are continually monitored throughout their lifecycle. Successful investments and those that are terminated or delayed are evaluated both to assess the impact on future proposals and to benefit from any lessons learned. The CPIC contains five phases (Pre-Select, Select, Control, Evaluate, and Steady State). As detailed in this document, each phase contains the following common elements:

Purpose: Describes the objective of the phase;

Entry Criteria: Describes the phase requirements, and thresholds for entering the phase;

Process: Describes the type of justification, planning, and review that will occur in the phase; and

Exit Criteria: Describes the action necessary for proceeding to the next phase.

Completing one phase is necessary before beginning a subsequent phase. Each phase is overseen by the IRB, which ultimately approves or rejects an investment's advancement to the next phase. This ensures that each investment receives the appropriate level of managerial review and that coordination and accountability exist.

DOI Bureaus and staff offices that have new IT investments meeting the "major" IT investment criteria should prepare an Exhibit 300 business case according to the guidelines provided in this document. Each Exhibit 300 business case is analyzed by OCIO for quality and conformance to policies and guidelines and reviewed against the applicable strategic investment criteria. OCIO analyses and scores the investment initiative. A recommendation is then prepared and forwarded to the DOI IRB for approval or disapproval. Approval, if granted, is an approval of concept for the pre-select phase, indicating that the office or Bureau has done the preparatory work necessary to fully justify the investment, and has the mechanisms in place to manage the investment through the CPIC phases. The investment must still compete for funding through DOI's budget process. The Exhibit 300 business case is further refined and submitted for DOI IRB approval at each subsequent phase.

All IT investments must conform to any guidance issued by the IRB in conjunction with the Modernization Blueprints for key lines of business.

1.8 Process Coordination

Approved investments must move through the CPIC processes to obtain investment funding. They must conform to any guidance issued by the IRB.

The Department is responsible for preparation of budget and or Working Capital Fund requests for its investment submissions.

1.9 Document Structure

This document is divided into six chapters and 15 appendices as described below:

Chapter 1: Introduction. Describes the CPIC purpose, scope, thresholds, roles, process, and documents the structure.

Chapter 2: Pre-Select Phase. Provides a process and mechanism, to assess an investment's support of the Department's strategic and mission needs

Chapter 3: Select Phase. Provides tools to ensure that IT investments are chosen that best support the department's mission and that support DOI's approach to enterprise architecture

Chapter 4: Control Phase. Provides guidance to ensure that IT investment initiatives are conducted in a disciplined, well-managed, and consistent manner, which promote the delivery of quality products and result in initiatives that are completed within scope, on time, and within budget

Chapter 5: Evaluate Phase. Provides guidance on comparing actual to expected results once a project has been fully implemented

Chapter 6: Steady State Phase. Provides a means to assess mature systems to ascertain their continued effectiveness in supporting mission requirements and to evaluate the cost of continued support or potential retirement and replacement

Chapter 7: Portfolio Management. Provides steps in the portfolio management process for selecting, funding, and managing IT investment portfolios

Appendices:

A: CPIC Process Checklist. Provides a checklist of the process steps investments must complete for each CPIC phase

B: Mission Needs Statement. Provides a template for evaluating the mission need(s) for a new IT investment

C: Operational Analysis. Provides a template for evaluating investments in the Steady State Phase

D: Cost-Benefit Analysis. Provides guidance on completing a Cost-Benefit Analysis (CBA)

E: Risk Management. Provides guidance on conducting a risk identification, qualification, response development, and response control for IT capital planning

F: Performance Measurement. Provides guidance on developing performance measures for IT investments

G: Project Management. Provides guidance on managing IT investments

H: Earned Value Analysis. Provides guidance on conducting earned value analysis

I: Post-Implementation Reviews. Provides guidance on conducting a Post-Implementation Review (PIR)

J: IT Investment Rating and Ranking Criteria. Provides the scoring criteria used by an EWG and the IRB during the annual investment review

K: Security Infrastructure Guide. Provides guidance concerning cyber security information to support the investment

L: eCPIC Requirements by Phase. Provides a summary of the data required in the Information Technology Investment Portfolio System (eCPIC) for each CPIC phase

M: Monthly and Quarterly Scorecards and Corrective Actions Report (CAR). Lists the critical areas the Control Review Team discusses during each Quarterly or Monthly Milestone Review

N: CPIC Process Assessment. Provides and overview of the CPIC Process, using the GAO's ITIM framework

O: Glossary of Terms and Acronyms. Provides definitions for terms and acronyms used throughout this document

P: References. Provides a list of references used to develop this document

2 Pre-Select Phase

2.1 Purpose

The Pre-Select Phase provides a process to assess a proposed investment's support of the Department's strategic plan and mission. It is during this phase that the business or mission need is identified and relationships to the Department strategic planning efforts are established. The Phase allows project teams to begin the process of defining business requirements and associated system performance metrics, performance measures, benefits, and costs, as well as subsequent completion of an Exhibit 300 business case and initial project planning efforts in preparation for inclusion in the Department's IT portfolio.

2.2 Entry Criteria

Prior to entering the Pre-Select Phase, investments must have a concept to address the mission need that is anticipated to include an IT component.

2.3 Process

During the Pre-Select Phase, mission analysis results in the identification of a mission need necessitating consideration of an IT alternative. The mission analysis and corresponding development of the Mission Needs Statement (MNS) (see **Appendix B: Mission Needs Statement**) are closely linked to the strategic planning process of the DOI. Following mission analysis, the Project Sponsor, or Functional Manager first checks to see if the requirement may be addressed in an investment identified in a Modernization Blueprint. If not, he or she further develops the proposed solution's concept. A 300-1 business case with budget estimates and associated CBA are completed. The level of detail required varies and should be commensurate with the size, complexity, and cost of the proposed investment.

Figure 2-1 provides a summary of the Pre-Select Phase process, as well as the individual(s) and or group(s) responsible for completing each process step. Each step is detailed in the following the diagram:

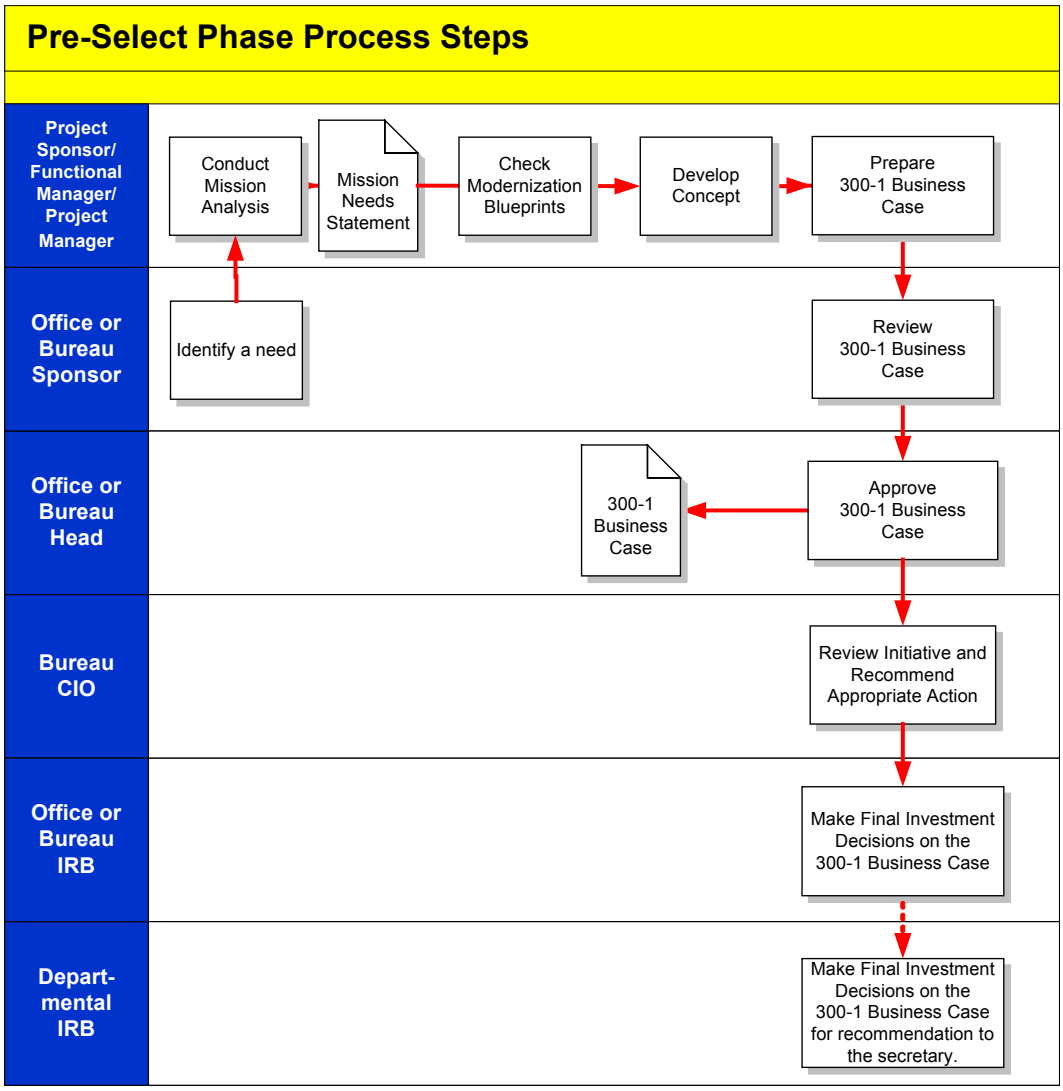


Figure 2-1 *Pre-Select Phase Process Steps*

2.3.1 Identify Project Sponsor

The DOI or Bureau Sponsor identifies a Project Sponsor for each accepted proposal who is the proponent for the investment. The Project Sponsor will normally be the same person as the Functional Manager but if the investment is crosscutting, strategic, or high visibility, the Project Sponsor may be different from the Functional Manager. A crosscutting investment spans multiple Bureaus. The Project Sponsor should be a senior individual in the organization with requisite management, technical, and business skills to lead the investment or supervise a designated Project Manager.

The Project Sponsor is the business leader responsible to the IRB for the investment as it continues through the CPIC process. Commercial and

government best practices show that IT investments championed by a business leader have the best chance for successful deployment. This commitment by the Project Sponsor to the IRB represents accountability for the investment.

2.3.2 Conduct Mission Analysis

Mission analysis is a strong, forward-looking, and continuous analytical activity that evaluates the capacity of the Department's assets to satisfy existing and emerging demands for services. Mission analysis enables the Department to determine and prioritize the most critical capability shortfalls and best technology opportunities for improving the DOI's overall security, capacity, efficiency, and effectiveness in providing services to customers.

Mission analysis is conducted within the framework of the Department's enterprise architecture and long-range strategic goals. In turn, mission analysis contributes strongly to the evolution of strategic planning and DOI IT architecture development. (See **Appendix B: Mission Needs Statement** for a template on how to conduct mission analysis.)

Consequently, mission analysis yields the identification of critical needs the Department should address. It estimates the resources the Department will likely be able to commit to each mission need, in competition with other needs, within the constraint of a realistic projection of future department budget authority. More accurate resources quantification is conducted during the investment analysis if the investment is selected as part of the Department's portfolio. The resource estimate is a function of the benefit to the department and the mission area, the cost of not addressing the need (e.g., poor customer responsiveness, increased maintenance cost, lost productivity, etc.), and the likely extent of required changes to the Department's infrastructure.

If the mission analysis reveals a non-IT solution (e.g., a rulemaking or policy change, operational procedural change, or transfer of systems between sites) that can satisfy a capability shortfall and can be achieved within approved budgets, it can be implemented without proceeding further in the CPIC process as a non-IT initiative.

A mission analysis should identify the business drivers (e.g., Department mission, vision, goals, objectives, and tactical plans.) Business drivers often involve the need to assist customers in a particular service area such as recreation on public lands and in national parks.

Once the key business drivers have been identified, a business requirements analysis is conducted. The business requirements analysis identifies how personnel conduct business activities in order to fulfill mission requirements, meet objectives and perform their tactical plans.

All Mission Needs Statements will emerge from a structured mission analysis. However, any individual or organization may propose a mission need based on a perceived capability shortfall or technological opportunity.

Examples of potentially valid needs that could originate outside DOI lines of business include those related to socioeconomic and demographic trends, the environment, statutory requirements, or an industry-developed technological opportunity. These shortfalls and opportunities should be identified to the appropriate Project Sponsor or Functional Manager who will determine how mission analysis should be conducted to validate, quantify, and prioritize the proposed need.

DOI lines of business conduct mission analysis within their areas of responsibility. The mission analysis consists of these principal activities:

Identify and quantify projected demand for services based on input from diverse sources; architecture and strategic planners for services needed in the future; and integrated project teams (IPTs) in the form of performance and supportability trends of fielded systems. Identify and quantify projected technological opportunities that will enable the DOI to perform its mission more efficiently and effectively.

Identify and quantify existing and projected services based on information from field organizations, the enterprise architecture, and IT asset inventory that defines what is in place and what is approved for implementation. Special attention should be paid to IT Modernization Blueprints, to determine whether investments identified may meet or might efficiently be extended to meet the newly identified requirement.

Identify, analyze, and quantify capability shortfalls (e.g., the difference between demand and supply) and technological opportunities to increase quality of service, efficiency, and effectiveness.

Identify the user and customer base affected.

Prepare a Mission Needs Statement that summarizes the mission analysis for inclusion with the Exhibit 300 or 300-1 business case.

When mission analysis identifies a capability shortfall or technological opportunity, the results are summarized in a Mission Needs Statement. The Mission Needs Statement must clearly describe the capability shortfall and the impact of not satisfying the shortfall, or the technological opportunity and the increase in efficiency it will achieve. The Mission Needs Statement also must assess the criticality and timeframe of the need, and roughly estimate the resources the Department should commit to resolving it based on worth, criticality, and the scope of likely changes to the Department's IT asset base. This information forms the basis for establishing the priority of this need in competition with all other Department needs.

2.3.3 Develop Concept

Concept development provides the opportunity for further examination of a proposed solution. It focuses on an analysis of alternatives to meet the mission need and initial planning for entering into the Select Phase. Key components include analysis of alternatives and an examination and redesign of business practices.

The following activities are conducted during concept development:

Assess Mission Needs Statement.

Identify business objectives based on mission analysis and Mission Needs Statement.

Discuss the proposed investment in relation to the OMB's three "Pesky Questions":

1. Does the investment in major capital asset support core or priority mission functions that need to be performed by the Federal Government?
2. Does it have to be undertaken by the requesting department because no alternative private sector or government source can more efficiently support the function?
3. Does the investment support work processes that have been simplified or otherwise redesigned to reduce costs, improve effectiveness, and make maximum use of commercial-off-the-shelf (COTS) technology?

Identify high-level performance measures. (Additional detailed performance measures will be developed as part of the Select Phase.)

Determine key selection criteria to evaluate concept alternatives that support high-level performance measures and business objectives.

Ensure solution aligns with Department standards for Security and Privacy, Enterprise Architecture and e-Government Planning.

Identify alternatives that will be analyzed to support mission need and business objectives.

Determine whether the investment may incorporate components applicable to other mission needs and, if so, whether it may be appropriate to identify it as a key "line of business" for the development of a Modernization Blueprint. If not, special care should be taken to determine and justify how the investment is truly unique and entails components that cannot be shared and reused for other purposes.

Conduct preliminary planning and develop a Concept Management Plan addressing Select Phase preparation, alternative analysis approach, and business redesign or reengineering. (Departmental policy requires that before new systems are fielded the business process owners must simplify or otherwise redesign their existing processes before they invest in new IT to support

the process.) Plans for redesign or business process reengineering (BPR) should be presented as part of the Exhibit 300 or 300-1 business case.

2.3.4 Develop 300-1 Business Case

The 300-1 business case provides the necessary information to build support and make funding decisions for an investment. While the primary emphasis of the Pre-Select Phase is on mission and strategic needs analysis, it also requires the Project Sponsor or Functional Manager to begin identifying alternative solutions and developing an order of magnitude estimate of costs and benefits (both quantitative and qualitative) that may be realized by a given investment. 300-1 business case development activities include a preliminary budget estimate and preliminary CBA, as discussed below.

Prepare preliminary budget estimate. The preliminary budget estimate should provide an estimate of costs necessary to support more detailed planning and concept development prior to investment selection, and provide an order of magnitude estimate of budget requirements to support a five-year budget plan and lifecycle costing.

As part of the preliminary budget estimate, a preliminary security analysis should be performed to determine estimated baseline costs. This information should be included with the investment's preliminary budget estimate. Detailed information concerning the preparation of a security analysis can be found in Appendix K: Security Infrastructure Guide.

Prepare Preliminary CBA. The preliminary CBA will provide initially anticipated costs and benefits of the proposed investment. Costs should be the same as those identified in the budget estimate and benefits should be aligned with the investment objectives and high-level performance measures. The level of detail required varies and should be commensurate with the size, complexity, and cost of the proposed investment.

The Project Manager, Project Sponsor or Functional Manager, and Bureau Sponsor prepare the Exhibit 300-1 business case in preparation for DOI's investment reviews.

2.3.5 Review or Approve Investment Submission

The Bureau Head reviews the investment submission and requests the Project Sponsor or Functional Manager and or Bureau Sponsor to update the 300-1 business case, or make changes as needed. The Bureau Head then approves the investment submission and forwards it to the CIO.

2.3.6 Review Initiative and Recommend Appropriate Action

The CIO reviews the 300-1 business case and provides any comments and or questions to the Bureau. The Bureau addresses the issues and sends an updated 300-1 business case to the CIO. The CIO forwards the updated 300-1 business case with its assessment to the Bureau IRB for review. The Bureau IRB assesses the investment with an emphasis on mission alignment, conformance to any applicable IT Modernization Blueprints, and the proposed concept management plan. This information is then linked to future portfolio selection decisions. The Bureau IRB forwards their investment recommendations to the DOI IRB for the final decision.

2.3.7 Make Final Investment Decisions

The DOI IRB reviews the Bureau's IRB recommendation and makes the final investment decisions. If the DOI IRB approves the Bureau's IRB recommendation, the investment moves forward into the Select Phase.

2.4 Exit Criteria

Prior to exiting the Pre-Select Phase, investments must obtain IRB approval for the mission need and concept.

Table 2-1 provides a summary of the documents generated during the Pre-Select Phase process, as well as the whether the document requires approval or whether the document is required only for the file for recordkeeping purposes.

Document	Required For File	Required For Approval
Mission Needs Statement	X	X
Concept	X	X
Exhibit 300-1	X	X

***Table 2-1** Summary of documents generated during the Pre-Select Phase.*

3 Select Phase

3.1 Purpose

In the Select Phase, DOI ensures the IT investments that best support the mission and DOI's approach to enterprise architecture are chosen and prepared for success (e.g.,, have a trained or experienced project manager, risk management, etc.). Investments are also reviewed to ensure no duplication of E-government initiative or existing DOI system application. Individual investments are evaluated in terms of technical alignment with other IT systems and projected performance as measured by Cost, Schedule, Benefit, and Risk (CSBR). Milestones and review schedules as part of a work breakdown structure (see Appendix G: Project Management) are also established for each investment during the Select Phase.

In this phase, DOI prioritizes each investment and decides which investments will be included in the portfolio. Exhibit 300-1 or 300 business case submissions are assessed against a uniform set of evaluation criteria and thresholds, as identified in OMB Circular A-11, Part 7—Planning, Budgeting, Acquisition, and Management of Capital Assets. The investment's CSBR are then systematically scored using objective criteria and the investment is ranked and compared to other investments. Finally, the DOI IRB selects which investments will be included in the Department's portfolio.

3.2 Entry Criteria

Prior to entering the Select Phase, investments must have obtained IRB approval for the mission need and concept.

3.3 Process

The Select Phase begins with an investment concept (approved during the Pre-Select Phase) and moves through the development of the Exhibit 300-1 or 300 business cases, acquisition plan, risk management plan, performance measures, and a project plan. These plans lay a foundation for success in subsequent phases. The Select Phase culminates in a decision whether to proceed with the investment.

Figure 3-1 provides a summary of the Select Phase process, as well as the individual(s) and or group(s) responsible for completing each process step. Each step is detailed in the following the diagram:

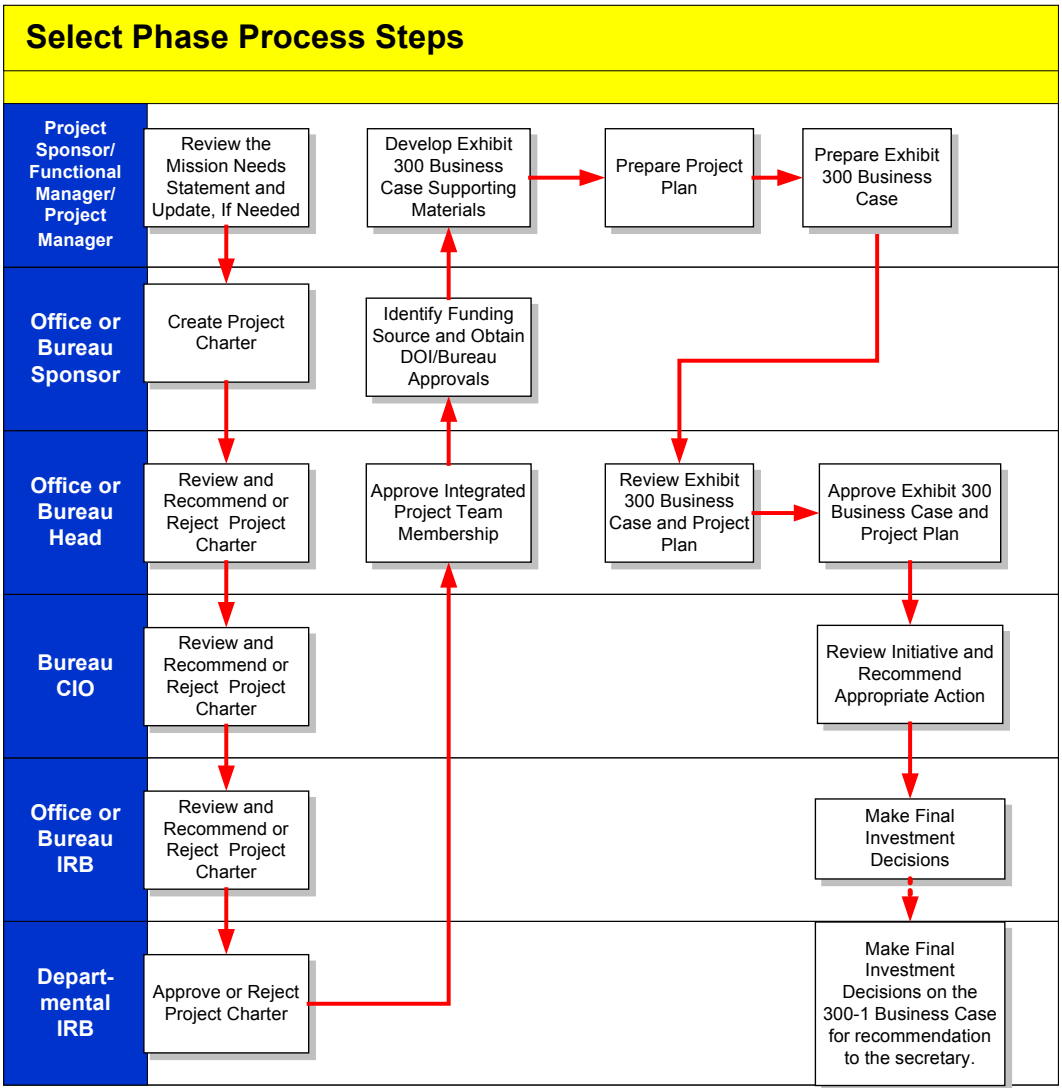


Figure 3-1*Select Phase Process Steps*

3.3.1 Review the Mission Needs Statement and Update if Needed

The Project Sponsor or Functional Manager, and Proponent review the Mission Needs Statement and other documentation completed during the Pre-Select Phase and makes any necessary changes. Next, the Project Sponsor or Functional Manager develops quantifiable performance measures that focus on outcomes where possible (see **Appendix F: Performance Measurement**). These performance measures will form a basis for judging investment success.

3.3.2 Create the Project Charter

The Project Sponsor creates the Project Charter and sends it to the Bureau Head for review. The Bureau Head then reviews it and makes a recommendation to the Bureau OCIO, who reviews it and sends it to the Bureau IRB and either recommend or reject the charter to the DOI IRB. The DOI IRB makes the final decision.

3.3.3 Approve Integrated Project Team Membership

The Bureau Head approves the selection of the IPT members that will assist the Project Sponsor and Project Manager in the initiative's development. The IPT brings together expertise from functional areas as required by the specifics of the initiative. A capital planning analyst from the CIO will work with and provide guidance to the IPT throughout the process.

The IPT should consider the need for expertise in these areas:

- Functional Manager
- IT Manager
- Security Specialist
- Department Budget Analyst
- Contracting Specialist
- Additional team members may be added from other functional areas

3.3.4 Identify Funding Source and Obtain Department Approvals

The Project Sponsor identifies a potential funding source for the IRB to continue investment support. The Project Sponsor then gets approval from the appropriate management office.

3.3.5 Develop Exhibit 300 Business Case Supporting Materials

The Project Sponsor ensures, that for each investment, the following studies are completed and the results are submitted to the CIO:

Business Profile:

Exhibit 300 business case with Performance Measures (see **Appendix F: Performance Measurement**) and mission needs statement

Business Process Reengineering Studies

Concept of Operations Plan

Stakeholder Identification and Requirements

Functional Requirements

Feasibility Study

Risk Profile:

Risk Management Plan (see **Appendix E: Risk Management**)

Financial Profile:

Return on Investment (ROI) and CBA (see **Appendix D: Cost-Benefit Analysis**)

Update lifecycle cost projections

Alternatives Analysis

Funding Source Identification

Technological Profile:

Technical Requirements

Security Plan (see **Appendix K: Security Infrastructure Guide**)

Enterprise Architecture Plan (see http://www.doi.gov/OCIO/architecture)

Relationship to Existing Systems (dependencies)

Prototype or Pilot Plans

Project Management and Planning Profile

Project Plan, including a list of team members

Acquisition Plan and strategy

3.3.6 Prepare Exhibit 300 Business Case

The Project Manager prepares the Exhibit 300 business case.

3.3.7 Review or Approve Exhibit 300 Business Case

The Bureau Head reviews the Exhibit 300-1 or 300 business cases and requests the Project Sponsor or Functional Manager, and or Bureau Sponsor to update the package or make changes as needed. The Bureau Head then approves the submission and sends it to the Bureau CIO.

3.3.8 Review Initiative and Recommend Appropriate Action

The Bureau CIO reviews the investment based on the established criteria, and develops findings and recommendations. The Bureau CIO forwards the package to the Bureau IRB for review. The Bureau IRB reviews the investment for compliance with Departmental strategic, legislative, and budgetary goals. The Bureau IRB uses standard criteria to objectively compare investments based on the data presented, and scores projects using the criteria listed in **Appendix J: IT Investment Rating and Ranking Criteria**. The Bureau IRB forwards its findings and recommendations to the DOI IRB for the final decision.

3.3.9 Make Final Investment Decisions

The DOI IRB reviews the Bureau's IRB recommendation and makes the final investment decisions. If the IRB approves the Bureau's IRB recommendation, then the decision is implemented and a review schedule for the Control Phase is established in concert with the CIO and Bureau IRB. The initiative then moves to the Control Phase.

3.4 Exit Criteria

Prior to exiting the Select Phase, investments must have executed the following activities:

- Established performance goals and quantifiable performance measures.
- Developed a project plan which details quantifiable objectives including an acquisition schedule, project deliverables, and projected and actual costs.
- Identified costs, schedule, benefits, and risks.
- Established security, Section 508 (IT accessibility), Privacy Act assessment, data, and architecture goals and measures.
- Established an EWG and IRB investment review schedule for the Control Phase.
- Determined whether another key line of business should be identified for recommendations to the IRB for the preparation of a comprehensive IT Modernization Blueprint.
- Obtained IRB approval to enter the Control Phase.

Table 3-2 provides a summary of the documents generated during the Select Phase process, as well as the whether the document requires approval or whether the document is required only for the file for recordkeeping purposes.

Document	Required For File	Required For Approval
Mission Needs Statement	X	
Collection Plan	X	
Business Process Reengineering Studies	X	
Concept of Operations Plan	X	
E-Government Plan	X	
Stakeholder Identification and Requirements	X	
Functional Requirements	X	
Feasibility Study	X	
Risk Management Plan	X	
Return on Investment (ROI) and CBA	X	
Updated lifecycle cost projections	X	
Alternatives Analysis	X	
Technical Requirements	X	
Security Plan	X	
Enterprise Architecture Plan	X	
Prototype or Pilot Plans	X	
Project Plan	X	x
Acquisition Plan and strategy	X	
Control Phase Investment Review Schedule	X	
Exhibit 300	X	X

***Table 3-2** Summary of documents generated during the Select Phase.*

4 Control Phase

4.1 Purpose

The objective of the Control Phase is to ensure, through timely oversight, quality control, and executive review, that IT initiatives are conducted in a disciplined, well-managed, and consistent manner. Investments should be closely tracked against the various components identified in the Risk Management Plan developed in the Select Phase. This phase also promotes the delivery of quality products and results in initiatives that are completed within scope, on time, and within budget. During this process, senior managers regularly monitor the progress or performance of ongoing IT investments against projected cost, schedule, performance, and delivered benefits. The DOI IRB has the ultimate responsibility for project oversight.

Control Phase activities require the continuous monitoring of ongoing IT initiatives through the development or acquisition lifecycle. Quarterly or monthly or milestone control reviews (see **Appendix M:**) are conducted, as identified in the project plan.

Based on the quarterly or monthly or milestone control reviews, the DOI IRB will determine if a project is continued, modified, or terminated. The reviews focus on ensuring that projected benefits are being realized; cost, schedule and performance goals are being met; risks are minimized and managed; and the investment continues to meet strategic needs. Depending on the review's outcome, decisions may be made to suspend funding or make future funding releases conditional on corrective actions.

4.2 Entry Criteria

Prior to entering the Control Phase, investments must have executed the following activities:

- Established performance goals and quantifiable performance measures
- Developed a project plan which details quantifiable objectives, including an acquisition schedule, project deliverables, and projected and actual costs
- Identified costs, schedule, benefits, and risks
- Established security, Section 508 (IT accessibility), Privacy Act assessment, data, and architecture goals and measures
- Established an EWG and IRB investment review schedule for the Control Phase
- Obtained IRB approval to enter the Control Phase

4.3 Process

During the Control Phase, an investment progresses from requirements definition to implementation. Throughout the Phase, Bureau CIO's provide the OCIO and the EWG with investment reviews to assist them in monitoring all investments in the portfolio. They also ensure that all planned investments do not duplicate any E-Government initiatives or any existing DOI system applications. Investment reviews provide an opportunity for Project Managers to raise issues concerning the IT developmental process, including security, telecommunications, enterprise architecture alignment, E-Government, GPEA compliance, Section 508 concerns, etc.

The project manager uses a performance based management system to evaluate project performance and report variance.

The DOI IRB review project performance, and take corrective action if the project performance variance exceeds 5 percent from the project's established baseline.

The DOI IRB reviews are based on factors including the strategic alignment, criticality, scope, cost, and risk associated with all initiatives. The Project Sponsor establishes milestones as part of the investment baseline against which performance will be measured throughout the Control Phase. Agencies are expected to uphold these milestones; OMB will hold agencies responsible for meeting milestones as originally indicated in the baseline. After establishing the milestones, the Project Sponsor revises the project plan as required to meet the approved milestones.

Figure 4-1 provides a summary of the Control Phase process, as well as the individual(s) and or group(s) responsible for completing each process step. Each step is detailed in the following diagram:

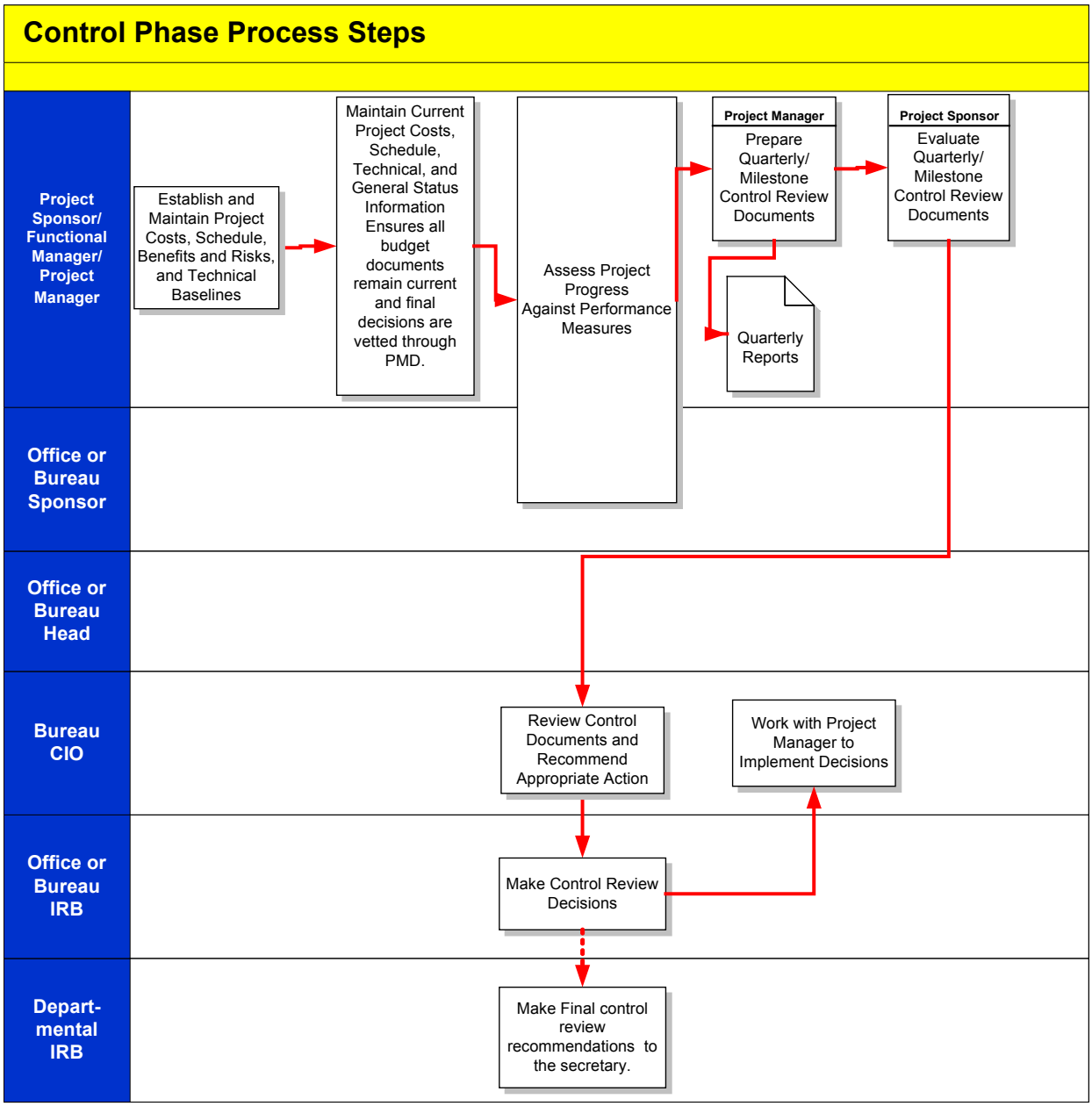


Figure 4-1 *Control Phase Process Steps*

4.3.1 Establish and Maintain Project Costs, Schedule, and Technical Baselines

The Project Manager maintains the project management and executive plans that were established in the Select phase; as well as the procedures, and practices to support initiative monitoring activities. The Project Manager directs the IPT to identify any new or existing internal risks based upon review of the work breakdown structure (WBS), project plan, risk checklist, and stakeholder interviews. The Project Manager monitors financial, technical, operational, schedule, legal and contractual, and organizational risks. The Project Manager ensures that all budget documents remain current and final decisions are vetted through the PMD. The Project Manager provides periodic updates to the CIO and or EWG on the investment's status and security costs, schedule, and technical baselines. The Project Manager ensures that the project has been planned realistically.

4.3.2 Maintain Current Project Cost, Schedule, Technical, and General Status Information

The Project Manager collects actual information on the resources allocated and expended throughout the Control Phase. The Project Sponsor ensures that the investment still aligns with the Department mission, strategic plan, enterprise architecture, and E-Government. The Project Manager compares the actual information collected to the estimated baselines developed during the Select Phase and identifies root causes for any differences. The Project Manager reviews the security and infrastructure analyses for accuracy. The Project Manager maintains a record of changes to the initiative's technical components including hardware, software, security, and communications equipment. Technical component changes may trigger a new architecture review.

4.3.3 Assess Project Progress against Performance Measures

As part of the periodic milestone reviews during the Control Phase, the Project Sponsor determines whether to continue the project. The Project Sponsor determines if the project manager is managing investment cost and schedule variance, mitigating risks, and providing projections for future performance based upon work accomplished to date. The Project Sponsor determines whether current cost and schedule projections align with investment implementation (e.g., based upon an assumption of baseline actual costs 10 percent greater than actual, what are the expectations of future performance).

The Bureau Sponsor and Project Sponsor apply control screening criteria (see **Appendix J: IT Investment Rating and Ranking Criteria**).

Using the control screening criteria to answer the questions on whether the project has met expectations will support the decision to continue with the investment, and identify any deficiencies and corrective actions needed. Updated investment information is submitted to the OCIO and the investment undergoes a control review by the DOI IRB. The results of these

	reviews are used by the DOI IRB for management of the IT investment portfolio.
4.3.4 Prepare Quarterly or Milestone Control Review	The Project Manager updates the Exhibit 300 business case on the planning and risk information and project performance. This includes updating the performance based management system metrics in Part I, Section I.H. in the Exhibit 300 business case.
4.3.5 Evaluate Quarterly or Milestone Control Review	The Bureau CIO evaluates the quarterly or milestone control review documents for project performance. The Bureau CIO and E-Gov team member endorses the investment and forwards the documentation to the OCIO.
4.3.6 Review Control Documents and Recommend Appropriate Action	The CIO prepares findings and recommendations, and forwards the updated package to the Bureau IRB for review. The Bureau IRB reviews the investment and determines whether to provide continued support to the investment and forwards its recommendations to the DOI IRB for the final decision (see **Appendix M: Monthly and Quarterly Scorecards, and** Corrective Actions Report (CAR)).
4.3.7 Make Final Control Review Decisions	The DOI IRB issues a decision, based upon the recommendations received from the Bureau IRB. The decision is sent to the Project Sponsor and Project Manager.
4.3.8 Project Sponsor and Project Manager Implement Decisions	The Project Sponsor acknowledges and implements any corrective action recommended by the IRB. Prior to the next scheduled review date, the Project Sponsor and Project Manager update the investment information and initiate another preliminary assessment. This formal monitoring of investment progress, and the determination of risks and returns, continues throughout the Control Phase.

4.4 Exit Criteria

Prior to exiting the Control Phase, investments must execute the following activities:

- Complete investment development, production deployment and or implementation.
- Confirm the PIR schedule

- Demonstrate to the IRB conformance with any applicable guidance issued pursuant to an IT Modernization Blueprint.
- Obtain DOI IRB approval to enter the Evaluate Phase.

Table 4-1 provides a summary of the documents generated during the Control Phase process, as well as the whether the document requires approval or whether the document is required only for the file for recordkeeping purposes.

Document	Required For File	Required For Approval
Project Management Plan	**X**	**x**
Project Status Reports	**X**	
Quarterly or Monthly Reports	**X**	**X**
PIR Schedule	**X**	
Exhibit 300	**X**	

***Table 4-1** Summary of documents generated during the Control Phase.*

5 Evaluate Phase

5.1 Purpose

The purpose of the Evaluate Phase is to compare actual to expected results after an investment is fully implemented. This is done to assess the investment's impact on mission performance, identify any investment changes or modifications that may be needed, and revise the investment management process based on lessons learned. As noted in GAO's Assessing Risks and Returns: A Guide for Evaluating Federal Agencies' IT Investment Decision-Making, "the Evaluation Phase 'closes the loop' of the IT investment management process by comparing actual against estimates in order to assess the performance and identify areas where decision-making can be improved."

The Evaluate Phase focuses on outcomes:

- Determines whether the IT investment met its performance, cost, and schedule objectives.
- Determines the extent to which the IT capital investment management process improved the outcome of the IT investment.

The outcomes are measured by collecting performance data, comparing actual to projected performance and conducting a Post Implementation Review (PIR) to determine the system's efficiency and effectiveness in meeting performance and financial objectives. The PIR includes a methodical assessment of the investment's costs, performance, benefits, documentation, mission, and level of stakeholder and customer satisfaction. The PIR is conducted by the Department, and results are reported to the CIO, EWG, and IRB to provide a better understanding of initiative performance and assist the Project Sponsor in directing any necessary initiative adjustments. Additionally, results from the Evaluate Phase are fed back to the Pre-Select, Select, and Control Phases as lessons learned.

5.2 Entry Criteria

The Evaluate Phase begins once a system has been implemented and the system becomes operational or goes into production. Any investment cancelled prior to going into operation must also be evaluated. Prior to entering the Evaluate Phase, investments must have executed the following activities:

- Complete investment development, production deployment and or implementation
- Confirm the Post Implementation Review (PIR) schedule
- Obtain DOI IRB approval to enter the Evaluate Phase

5.3 Process

In the Evaluate Phase, investments move from implementation or termination to a PIR and the IRB's approval or disapproval to continue the investment (with or without modifications). From the time of implementation, the system is continually monitored for performance, maintenance activities, costs, resource allocation, defects, problems, and system changes. System stability is also periodically evaluated. During the PIR, actual performance measures are compared to performance projections made during the Select Phase. Then lessons learned for both the investment and the CPIC process are collected and fed back to prior CPIC phases.

Figure 5-1 provides a summary of the Evaluate Phase process, as well as the individual(s) and or group(s) responsible for completing each process step. Each step is detailed in the following diagram on the next page.

5.3.1 Conduct PIR and Present Results

The PIR's timing is usually determined during the Control Phase. The PIR for a newly deployed initiative generally should take place approximately six to twelve months after the system is operational. In the case of a terminated system, it should take place immediately because the review will help to define any "lessons learned" that can be factored into future IT investment decisions and activities. In either case, before starting the PIR, the Project Sponsor develops a PIR plan that details the roles, responsibilities, and investment start and end dates for all PIR tasks.

At the heart of the PIR is the IT investment evaluation in which the Project Sponsor looks at the impact the system has had on customers, business processes, the mission and program, and the technical capability. As a result of the PIR, the Project Sponsor provides an IT Initiative Evaluation Data Sheet to the CIO, as presented in Table-1Appendix O.

The IT investment evaluation focuses on three areas:

Impact to stakeholders: The Project Sponsor typically measures the impact the system has on stakeholders through user surveys (formal or informal), interviews, and feedback studies. The evaluation data sheet highlights results.

Ability to deliver the IT performance measures (quantitative and qualitative). The system's impact to mission and program should be carefully evaluated to determine whether the system delivered expected results. This information should be compared to the investment's original performance goals. This evaluation and comparison should also include a review of the investment's security and data performance measures.

Ability to meet baseline goals: To determine whether the investment is meeting its baseline goals the project manager should review the following areas:

Cost: Present actual lifecycle costs to date

Return: Present actual lifecycle returns to date

Funding Sources: Present actual funds received from planned funding sources

Schedule: Provide original baseline and actual initiative schedule

Enterprise Architectural Analysis: Determine whether the initiative supports the Department's approach to enterprise architecture standards or what modifications are required to ensure initiative compliance outside the original architectural baseline

IT Accessibility Analysis: Determine whether the initiative addresses accessibility for persons with disabilities, how the requirements were managed, and impact on the architecture

Risk Analysis: Identify initiative risks and how they were managed or mitigated, as well as their effects, if any (see **Appendix E: Risk Management**)

Systems Security Analysis: Identify initiative security risks and how they were managed or mitigated as well as security performance measures (for more information, see **Appendix K: Security Infrastructure Guide**).

After the PIR has been completed and reviewed, the Project Sponsor prepares and makes a formal PIR presentation to the Bureau CIO. The presentation should summarize the initiative evaluation and provide a summary of recommendations for presentation to an EWG and the DOI IRB.

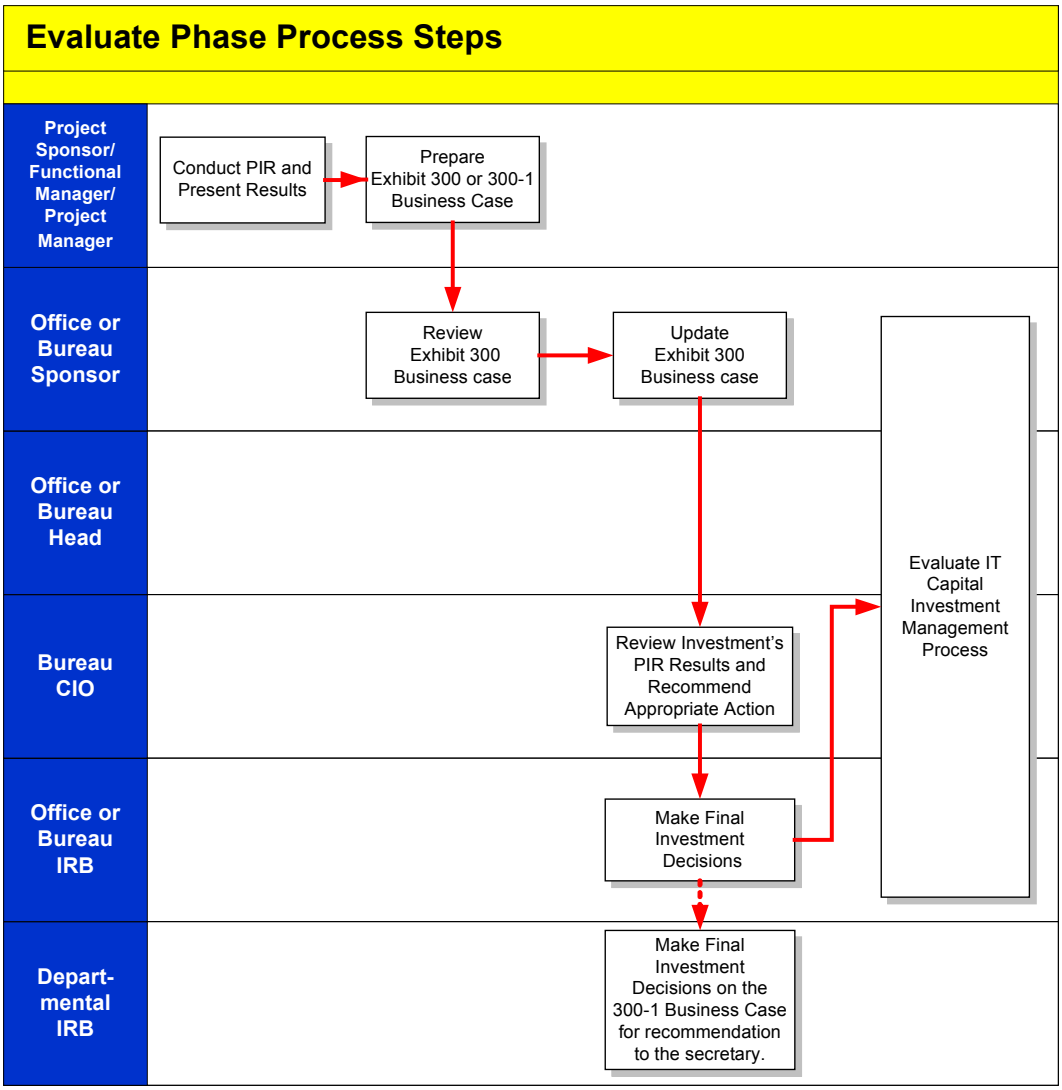


Figure 5-1 *Evaluate Phase Process Steps*

5.3.2 Prepare Exhibit 300 business case

Each investment in the Evaluate Phase will be assessed during the investment review. To prepare for the investment reviews, the Project Sponsor develops a package of materials that address the PIR strategic investment criteria. The format for submitting the investment package is the Exhibit 300 business case.

5.3.3 Review or Approve Exhibit 300 Business Case

The Bureau Sponsor reviews the Exhibit 300 business case and PIR results, and forwards them to the Bureau CIO.

5.3.4 Review Exhibit 300 Business Case and PIR Results and Recommend Appropriate Action

The Bureau CIO reviews the Exhibit 300 business case and PIR results. The Bureau CIO prepares findings and recommendations, and forwards the updated package to a Bureau IRB for review. The Bureau IRB reviews the investment and makes a recommendation that the investment's Project Sponsor take one of the following actions:

- Continue the investment as planned
- Modify the investment as recommended
- Terminate the investment

5.3.5 Make Final Investment Decisions

The DOI IRB reviews the Bureau IRB recommendation and makes the final investment decision.

5.3.6 Evaluate IT Capital Investment Management Process

An EWG may also recommend that the CIO revise the CPIC process based on PIR results. The CIO then presents a summary of the PIR activities and lessons learned to the EWG and DOI IRB.

Following the completion of this, the CIO and Bureaus document the strengths and weaknesses of the CPIC and IT Modernization Blueprint analyses processes. The information gathered in this evaluation is used to improve both the CPIC and IT Modernization Blueprint processes, by maintaining and improving the factors associated with improved initiative success rates and revising or removing the non-value added steps. These process improvements are discussed as a regular agenda item for the DOI IRB.

Bureaus can use Table O-2 in Appendix O: Post Implementation Review (PIR) to record observations and forward them to the CIO as necessary. Bureaus can add appropriate comments as deemed necessary. The following are examples of things Bureaus may consider when addressing each phase:

Initiative Development

- Documentation set
- General or descriptive information
- Financial information
- Security or ISTA models

Screen

- Viability criteria
- Viability considerations
- Initiative designation

Score

- Mission criteria
- Risk

ROI

Pre-Select

Bureau process
CIO or EWG review
IRB endorsement

Select

Bureau process
CIO or EWG review
IRB endorsement
Security review

Control

Milestone review format
CIO or EWG or corrective actions
Security analysis

Evaluate

PIR content
PIR execution
PIR recommendations
Security performance

To capture lessons learned, the Project Sponsor develops a management report and submits it to the Bureau CIO. All failures and successes are collected and shared to ensure that future initiatives learn from past experiences. A high-level assessment of management techniques, including organizational approaches, budgeting, and acquisition and contracting strategies, tools and techniques, and testing methodologies, is essential to establish realistic baselines and to ensure the future success of other IT initiatives. The investment management report, including lessons learned, follows the outline provided in Appendix O: Post Implementation Review (PIR).

The DOI CIO schedules formal and informal sessions to review the management report and collect additional information about the overall effectiveness of the process. The DOI and Bureau CIOs work with the Project Sponsor, Bureau Portfolio Managers, and an EWG to conduct trend analyses of the process, validate findings, and adjust the process accordingly. The DOI CIO also sponsors workshops and discussion groups to improve the CPIC process and ensure lessons learned are applied throughout the Department. The DOI CIO then works with the Bureau to develop, recommend, and implement modifications to improve the process.

5.4 Exit Criteria

Prior to exiting the Evaluate Phase, investments must have completed the following activities:

- Conducted a PIR – which may include one or all of these documents:
    - Initiative Evaluation Sheet
    - Investment Management Report
    - IT Process Evaluation Data Sheet
- Established an Operations and Maintenance (O&M) and operational performance review schedule
- Obtained IRB approval to enter the Steady State Phase

Table 5-1 provides a summary of the documents generated during the Evaluate Phase process, as well as the whether the document requires approval or whether the document is required only for the file for recordkeeping purposes.

Document	Required For File	Required For Approval
PIR Plan	X	
IT Initiative Evaluation Data Sheet	X	
IT Process Evaluation Data Sheet		
PIR Presentation	X	
Exhibit 300	X	
Investment Management Report	X	
Operations and Maintenance (O&M) and operational performance review schedule	X	

Table 5-1 *Summary of documents generated during the Evaluate Phase.*

6 Steady State Phase

6.1 Purpose

The Steady State Phase provides the means to assess mature investments, determine their continued effectiveness in supporting mission requirements, evaluate the cost of continued maintenance support, assess technology opportunities, and consider potential retirement or replacement of the investment.

6.2 Entry Criteria

Prior to entering the Steady State Phase, investments must have executed the following activities:

- Conducted a PIR
- Established an (O&M) and operational performance review schedule
- Obtained IRB approval to enter the Steady State Phase

6.3 Process

During the Steady State Phase, analysis is used to determine whether mature systems are continuing to support mission and business requirements. **Appendix C: Operational Analysis** provides a template for conducting Steady State investment reviews.

Figure 6-1 provides a summary of the Steady State Phase process, as well as the individual(s) and or group(s) responsible for completing each process step. Each step is detailed in the following diagram.

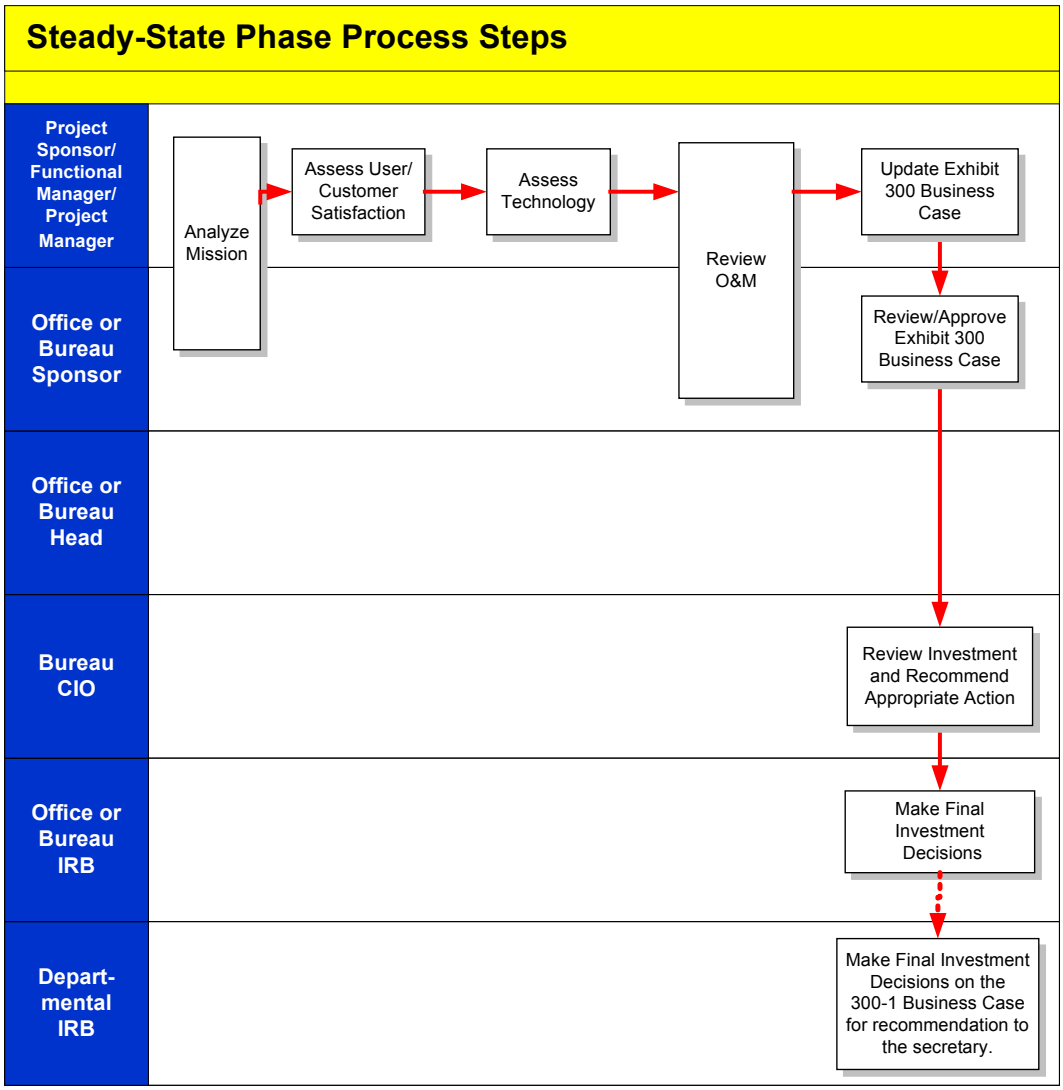


Figure 6-1 *Steady State Process Steps*

6.3.1 Analyze Mission

The Project Sponsor and Bureau Sponsor conduct an analysis to determine if the system is continuing to meet mission requirements and needs and supports the DOI's evolving strategic direction. The mission analysis process identified in the Pre-Select Phase and the Mission Needs Statement provide a framework to assist in the mission analysis for the Steady State Phase. This includes an analysis of performance measures accomplishment.

6.3.2 Assess User or Customer Satisfaction	The Project Sponsor evaluates user and customer satisfaction, acceptance, and support for the existing system. This information should be used to assess and update the investment's performance measures.
6.3.3 Assess Technology	The Project Manager and Project Architect assesses the technology and determines potential opportunities to improve performance, reduce costs, support the DOI enterprise architecture, meet security requirements, and to ensure alignment with DOI's strategic direction. The Project Architect monitors and maintains the existing technology and determines technology refresh schedules, factoring into account not only existing IT Modernization blueprints but also the need and potential to identify new key lines of business based upon new mission needs and or innovative technology. The Project Architect informs the Project Sponsor of his or her findings.
6.3.4 Review O&M	The Project Sponsor and Bureau Sponsor along with the Project Manager conduct an O&M review to assess the cost and extent of continued maintenance and upgrades. The O&M review should include a trend analysis of O&M costs and a quantification of maintenance releases. Costs for government staff workforce employees as well as any customer costs should be included in all cost estimates and analysis.
6.3.5 Prepare Exhibit 300 or 300-1 Business Case	The Project Sponsor updates actual costs and benefits for the investment. The format for submission is the Exhibit 300 or 300-1 business case.
6.3.6 Review or Approve Exhibit 300 Business Case	The Bureau Sponsor reviews the Exhibit 300 or 300-1. The Bureau Sponsor approves the investment submission and forwards it to the Bureau CIO.

6.3.7 Review Exhibit 300 or 300-1 Business Case and Recommend Appropriate Action

The Bureau CIO reviews the Exhibit 300 or 300-1 business case and prepares findings and recommendations. The CIO forwards it to the Bureau IRB for review. The Bureau IRB reviews the investment to determine whether it continues to support mission or user requirements and the Department's strategic direction. The Bureau IRB determines whether the investment should continue in the Steady State Phase, return to a previous phase due to the extent of system modifications, be replaced, be incorporated into a key line of business investment through a Modernization blueprint, or retired. The Bureau IRB then forwards its recommendations to the DOI IRB.

6.3.8 Make Final Investment Decisions

The DOI IRB approves or disapproves the Bureau IRB recommendation and directs the Project Sponsor how to proceed.

6.4 Exit Criteria

The investment remains in the Steady State Phase until a decision is made by the DOI IRB to modify, replace, or retire the system. All major enhancements to Steady State systems are required to complete an MNS and start at the Pre-Select Phase. A major enhancement can be defined as, new architecture, or new functionality.

Table 6-1 provides a summary of the documents generated during the Steady State Phase process, as well as the whether the document requires approval or whether the document is required only for the file for recordkeeping purposes.

Document	Required For File	Required For Approval
Exhibit 300 or 300-1	**X**	**X**
Operational Analysis	**X**	

***Table 6-1** Summary of documents generated during the Steady State Phase.*

7 Portfolio Management

7.1 Purpose

The purpose of IT Portfolio Management is to ensure that an optimal IT investment portfolio with manageable risk and returns is selected and funded. Portfolio Management includes the following steps:

- Defining portfolio goals and objectives
- Understanding, accepting and making tradeoffs
- Identifying, eliminating, and minimizing risks
- Monitoring portfolio performance
- Determining whether desired goals and objectives have been obtained
- Determining how each portfolio fits into the overarching architecture for the Department as a whole, including, IT Modernization Blueprints for key lines of business.
- The benefits of IT Portfolio Management are that it:
    - Encompasses the entire investment management process (pre-select, select, control, evaluate and steady state)
    - Aids investment management decision-making by providing the necessary information
    - Provides the information necessary for monitoring cost and performance
    - Helps determine whether an investment should be continued, modified, integrated with others, or terminated

7.2 Entrance Criteria

In order to perform the activities associated with selecting, funding and managing an optimal IT investment portfolio, adequate resources must be provided for executing the process.

IRB members must exhibit core competencies in portfolio management.

All investments within the portfolio have been analyzed and prioritized based on each investments, cost, benefit, schedule and risks, throughout their life-cycle, and that the Department has defined its common portfolio categories.

7.3 Process

The portfolio management process ensures that each IT investment board collectively analyzes and compares all investments and proposals to select those that best fit with the strategic business direction, needs, and priorities of the Department. In addition, DOI will have fiscal and workforce constraints that have to be weighed against the risks and the long term return on investments for items that are within the portfolio. When making portfolio decisions, executive must consider use of IT resources, along with work force, and contracting options to meet mission objectives,

To address these practical limits, portfolio management uses categories to aid in investment comparability and cost, schedule, benefit and risk (CSBR) oversight. Once all investments within the portfolio are categorized, investments and proposals can be compared to one another within and across portfolio categories, and the best overall portfolio can be selected and funded.

Portfolio Management is an integral component of the CPIC process; however, IT Portfolio Management cannot be accomplished without first establishing an IT investment foundation.

Building an IT investment foundation, using GAO's IT Investment Management maturity model as described in GAO/AIMD-10.1.23, requires that DOI first establish IT investment management processes to ensure the following activities:

- IT investment is selected based on established selection criteria
- An Investment proposal is business driven
- IRB establishes and maintains an asset inventory of current IT investments
- IRB oversees these investments

With maturity and experience in establishing an IT investment foundation, DOI can move forward with developing a complete investment portfolio. Based on the GAO model cited above, portfolio management maturity efforts to develop the DOI IT portfolio are based on the following principles:

- Ensuring the alignment of the various IRBs
- Developing portfolio selection rating, and ranking criteria that supports DOI mission and strategic goals
- Conducting continuous analysis of each investment at every phase of it's life-cycle
- Developing IT portfolio performance measures

7.4 Demonstration Criteria

To demonstrate that portfolio management is occurring, there must be physical, documentary and testimonial evidence of portfolio management activities.

Document	Required For File	Required For Approval
Bureau IRB Meeting Minutes for decisions made	X	
DOI IRB Meeting Minutes for decisions made	X	
Quarterly Reports	X	X
Operational Analysis	X	X
ITIM Self Assessments	X	
CPIC Guide	X	
IRB Charter	X	X
ITMC Charter	X	X
ARB Charter	X	X
E-Gov Charter	X	X
Investment Rating and Ranking Summary	X	X

Appendix A: CPIC Process Checklist

A.1 Pre-Select Phase

What are the business needs for the investments?

- ❑ *The Project Sponsor in coordination with Bureau management identifies a need.*
- ❑ *The Project Sponsor along with both the Functional and Project Managers conduct a mission analysis and create a Mission Needs Statement.*
- ❑ *The Project Sponsor along with both the Functional and Project Managers develop the investment's concept.*
- ❑ *The Project Sponsor along with both the Functional and Project Managers prepare the preliminary Exhibit 300-1 business case.*
- ❑ *The Project Sponsor along with both the Functional and Project Managers prepare the Exhibit 300-1 business case.*
- ❑ *The Office or Bureau Head reviews and approves the Exhibit 300-1 business case.*
- ❑ *The Bureau CIO confirm that new investments do not duplicate E-Government initiatives,*
- ❑ *The Bureau CIO reviews the initiative and recommends an appropriate action to the Office or Bureau IRB.*
- ❑ *The Departmental DOI IRB makes the final investment decisions.*

A.2 Select Phase

How do you know you have selected the best investments?

- ❑ *The Project Sponsor along with both the Functional and Project Managers review and updates the Mission Needs Statement.*
- ❑ *The Project Sponsor approves IPT membership.*
- ❑ *The Office or Bureau Sponsor identifies the funding source(s) and obtains Department approvals.*
- ❑ *The Project Sponsor along with both the Functional and Project Managers develop supporting materials for major investments.*
- ❑ *The Bureau CIO confirms that new investments do not duplicate E-Government initiatives.*
- ❑ *The Project Sponsor along with both the Functional and Project Managers prepare the investment review submission.*
- ❑ *The Office or Bureau Head reviews and approves the investment submission.*
- ❑ *The Bureau CIO reviews the initiative and recommends an appropriate action to*

the Bureau IRB.

- *The Departmental DOI IRB makes the final investment Select decisions.*

A.3 Control Phase

What are you doing to ensure that the investments will deliver the benefits projected?

- *The Project Manager maintains initiative and security costs, schedule, and technical baselines.*
- *The Project Manager maintains current initiative and security costs, schedule, and technical and general status information.*
- *The Project Manager, IPT, and Bureau Sponsor assess the initiative's progress against performance measures.*
- *The Project Manager prepares the quarterly or milestone control reviews, annual investment review submission package. The Project sponsor evaluates quarterly or milestone control review documents.*
- *The Bureau CIO reviews the initiative and recommends an appropriate action to the Bureau IRB. The Bureau IRB sends recommendations to the DOI IRB.*
- *The Departmental DOI IRB makes final investment Control decisions.*
- *The Bureau CIO works with the Project Sponsor and Project Manager to develop solutions to identified issues.*

A.4 Evaluate Phase

Based on your evaluation, did the investments deliver what you expected?

- *The Project Sponsor along with both the Functional and Project Managers conduct a PIR, prepare and Exhibit 300 or 300-1 if necessary and presents results to the Bureau CIO, EWG, and Bureau IRB.*
- *The Office or Bureau Sponsor reviews the Exhibit 300 and makes updates if necessary.*
- *The Bureau CIO reviews and approves the PIR results and recommends the appropriate action.*
- *The Bureau IRB makes final investment recommendations to the DOI IRB*
- *The DOI IRB makes the final investment decisions.*
- *The Bureau CIO, CPWT member and Bureau IRB evaluate the IT capital investment management process. The DOI IRB will make the updates to the CPIC process improvement.*

A.5 Steady State Phase

Do the investments still cost-effectively support requirements?

- *The Project Sponsor along with both the Functional and Project Managers determine if the investment is still effective and supports the mission requirements.*
- *The Project Sponsor along with both the Functional and Project Managers assess user and customer satisfaction.*
- *The Project Architect along with both the Functional and Project Managers conduct a technology assessment.*
- *The Project Sponsor along with both the Functional and Project Managers and the Bureau Sponsor review O&M costs.*
- *The Project Sponsor along with both the Functional and Project Managers updates the Exhibit 300 or 300-1.*
- *The Bureau Head reviews and approves the updated Exhibit 300 or 300-1.*
- *The Bureau CIO reviews the initiative and recommends an appropriate action to the Bureau IRB. The Bureau IRB sends their recommendation to the DOI IRB.*
- *The Departmental DOI IRB makes final investment decisions.*

A.6 Process Improvement

Is the current CPIC process progressing through the stages of ITIM maturity?

- *The Bureau CPIC Coordinator performs an annual self-assessment using the ITIM self Assessment Tool found in Appendix N: CPIC Process Assessment*
- *The Bureau CPIC Coordinator provides the analysis to the DOI CPIC Coordinator for inclusion in the Department's process inventory and also forwards on any process improvements to the DOI CPIC Coordinator.*
- *The DOI CPIC Coordinator provides recommendations and supports the Bureau CPIC Coordinator to help the Bureau achieve the next stage.*
- *The Bureau CIO reviews the changes and recommends an appropriate action to the Bureau IRB. The Bureau IRB sends their recommendation to the DOI IRB.*
- *The Departmental DOI IRB makes final process change decisions.*

In Addition:

- *At any time, the Bureau CPIC Coordinator, or Project Manager or Project Sponsor can make a recommendation for process improvement. These should be sent to the DOI CPIC Coordinator.*
- *Quarterly, the CPIC coordinator monitors quarterly reports and corrective action plans and provides any necessary guidance and direction.*
- *Semi –annually, the CPWT meets to conduct process review workshops.*

Appendix B: Mission Needs Statement

B.1 Purpose

The Mission Needs Statement (MNS) is completed during the Pre-Select Phase. It is a summary document that describes the operational problem and presents the major decision factors that an EWG and IRB should evaluate in considering the need and proposed investment.

The following section provides a template for preparing the Mission Need Statement. Detailed quantitative and analytical information should be included as attachments.

B.2 Mission Need Statement Template

General Instructions for Completing the Mission Need Statement

The Mission Need Statement is created during the Pre-Select Phase (see page 21) and must analytically justify:

(1) the need for action to resolve a shortfall in the Department's ability to provide the services needed by its users or customers, or

(2) the need to explore a technological opportunity for performing Department missions more effectively.

The Mission Needs Statement must be derived from rigorous mission analysis (e.g.,, continuous analysis of current and forecasted mission capabilities in relationship to projected demand for services) and must contain sufficient quantitative information to establish and justify the need and decision.

MISSION NEEDS STATEMENT	
MNS 1. Administrative Information	
Template Name	eCPIC Field – Lists template under which process was created.
Investment Name	From Exhibit 300
Point of Contact	eCPIC field – normally the CPIC Coordinator.
(MNS) Originator	Individual, who is entering or submitting the MNS, could be the sponsor or project manager. Form assumes that someone other than the sponsor will enter the form – thus the originator field.
(MNS) Originator Organization	
(MNS) Originator Phone	
Program Activity	From the Exhibit 300
(MNS) Investment Category	E-Gov, Cross-Cutting, or Bureau Specific
Is there a sponsor or owner for this investment?	From the Exhibit 300
If so, identify the sponsor or process owner by name.	
From the Exhibit 300	
If so, provide the sponsor or process contact information.	
From the Exhibit 300	
(MNS) Has the Sponsor reviewed and approved the submission of this Mission Needs Statement?	Indicate whether sponsor is aware of the MNS being submitted.
(MNS) Submission Date	Date MNS was originally submitted.
(MNS) Revision Number	Revision field available to differentiate from older versions. Can also use the overall version field that eCPIC provides.
(MNS) Revision Date	Revision Date – if used.

MNS 2. Impact on DOI Mission Areas

How does this investment support your agency's mission and strategic goals and objectives?

Field reused from Exhibit 300.

Briefly describe the impact of the capability shortfall or technological opportunity with respect to performance metrics, goals, or standards in DOI mission areas. Performance goals are delineated in the DOI and Bureau strategic plan, business plans, and annual performance plan prepared in compliance with GPRA (Public Law 103-62). This should be linked directly to the DOI strategic plan, the Bureau strategic plan and the E-Gov Strategy.

MNS 3. Needed Capability

(MNS) Needed Capability

Describe the functional capability needed or technological opportunity. Describe needed capability in terms of functions to be performed or services to be provided. Cite any Congressional, Secretary, or other high-level direction, such as international agreements, to support the needed capability. Cite any statutory or regulatory authority for the need. Provide validated growth projections based on operational analysis.

This is not a description of an acquisition program (e.g., this is not the details of a particular hardware or software solution). Do not describe needed capability in terms of a system or solution but rather focus on the business or mission aspects.

MNS 4. Current and Planned Capability

(MNS) Current and Planned Capability

Describe quantitatively the capability of systems, facilities, equipment, or other assets currently deployed or presently planned and funded to meet the mission need. Where applicable, use tables to present the information. If this Mission Need Statement proposes to replace an existing investment, provide existing system name and OMB number. References should be made to the existing architecture and asset inventory. Provide back up data in attachments.

MNS 5. Capability Shortfall

(MNS) Capability Shortfall

Describe the capability shortfall and explain the performance analysis that was used to identify and quantify the extent of the shortfall over time. Define the ability of the current technology to meet the business requirements in support of the mission. Identify changes between current state and future state of technology, and provide recommendations for closing gaps between the two. Define, in detail, the specific limitations of current facilities, equipment, or service to meet projected demand and the needed capability. Explain the criteria used to measure performance. Include appropriate graphs, tables, and formulas to define the extent of the shortfall. Identify databases and other data sources upon which the analysis is based. Identify models and methodologies used to quantify the shortfall.

Alternately, describe the technological opportunity in terms of improved DOI productivity, facility availability, operational effectiveness, or improved efficiency. In attachments, explain the analysis used to quantify the magnitude of the opportunity, and identify and describe databases, models, and methodologies used to support the analysis.

Provide specific operational and performance analyses, quantitative projections, maintenance indicators, reports, recommendations, or other supporting data, as attachments.

MNS 6. Impact of Not Approving Mission Need

(MNS) Impact of Not Approving the Mission Need

Describe the impact if this capability shortfall is not resolved relative to the DOI's ability to perform mission responsibilities. Define the expected change in mission performance indicators if the capability shortfall is not resolved.

Include as attachments appropriate graphs, tables, and formulas used to quantify the impact on performance. Identify databases, other sources of data, models, and methodologies used to support the impact analysis. Explain performance analyses used to quantify the impact of not implementing the opportunity, and identify the external factors (such as validated growth projections) used to support the analysis.

MNS 7. Benefits

(MNS) Benefits

How will this investment reduce costs or improve efficiencies?

Field reused from the Exhibit 300.

Summarize the mission analysis determination of benefits. Describe the benefits accrued by the needed capability or technological opportunity. Benefits may accrue from more efficient operations, improved responsiveness to customers, lower operational costs, or other savings.

The summary of accrued benefits should describe ground rules and assumptions, benefits, estimating methods, sources, and models. Include as attachments appropriate graphs, tables, and formulas used to quantify the benefits.

MNS 8. Timeframe
(MNS) Timeframe
Identify when the capability shortfall will seriously affect the Department's ability to perform its mission if no action is taken. Establish when action must be taken to avoid the adverse impact on services that will result. Explain the performance analysis used to quantify the extent of the impact over time. Discuss the linkage to budget decisions. Explain how long it will take to study, develop, and implement the investment. In general terms, discuss not just when it is needed, but when it can get done.

MNS 9. Criticality
(MNS) Criticality
State the priority of this mission need relative to other Departmental needs. First, define the priority of this need relative to other needs within the mission area, and then define the priority relative to needs across all mission areas. Characterize whether the mission need identifies internal DOI capability shortfalls or mainly shortfalls in servicing the customer community.

MNS 10. Long Range Resource Planning Estimate
(MNS) Long Range Resource Planning Estimate
Provide a rough estimate of the resources that will likely be committed to this mission need in competition with all others, within the constraint of realistic projections of future budget authority.

MNS Bureau IRB Decision	
(MNS) Bureau IRB Decision	Bureau IRB Disposition
(MNS) Bureau IRB Comments	
(MNS) Bureau IRB Decision Date	

MNS DOI IRB Decision	
(MNS) DOI IRB Decision	Departmental IRB Disposition
(MNS) DOI IRB Comments	
(MNS) DOI IRB Decision Date	

Appendix C: Operational Analysis

C.1 Purpose

This document provides guidance for conducting an Operational Analysis review for Information Technology (IT) investments. OMB requires that all Steady State projects must be reviewed at least annually to document the continued effectiveness in supporting mission requirements and minimize the cost of asset ownership.(The cost of asset ownership is defined as the total of all costs incurred by the owners and users to obtain the benefits of a given project or investment.) The intent, in part, is to reduce the number of stove-piped legacy systems that are expensive to maintain. Operational Analysis results are reported to OMB each year in the Exhibit 300's Project (Investment) and Funding Plan section. A project manager may choose to perform an Operational Analysis more frequently.

The annual Operational Analysis is a key practice within the Government Accountability Office's (GAO) Information Technology Investment Management (ITIM) Stage 2 maturity model.

Using verifiable data, each investment board must regularly review the performance of IT projects and systems against stated expectations. Investment boards use of the Steady State project's Operational Analysis support ITIM Stage 2.

C.2 Management Objectives

Ownership costs such as: operations, maintenance, service contracts, and disposition, can easily consume as much as 80% of the total life-cycle costs. Operations are a critical area where improved effectiveness and productivity can have the greatest net measurable benefit in cost, performance, and mission accomplishment.

The Operational Analysis formally assesses how well an investment is meeting program objectives, customer needs, and is performing within baseline cost, schedule, and performance goals. The results may signal to management the need to redesign an asset if undetected faults in the design, construction, or installation are discovered during the course of operations. Two examples may be: if Operation and Maintenance (O&M) costs are higher than anticipated; or, if the asset fails to meet program requirements.

C.3 Roles and Responsibilities

Project Sponsor or System Owner: Coordinates with the Project Manager to schedule the Operational Analysis and provides guidance to the Project Manager.

Project Manager: Prepares the Operational Analysis.

OCIO: Receives and analyzes the Operational Analysis report.

Investment Review Board: Reviews the Operational Analysis report and makes recommendations for disposition of the investment.

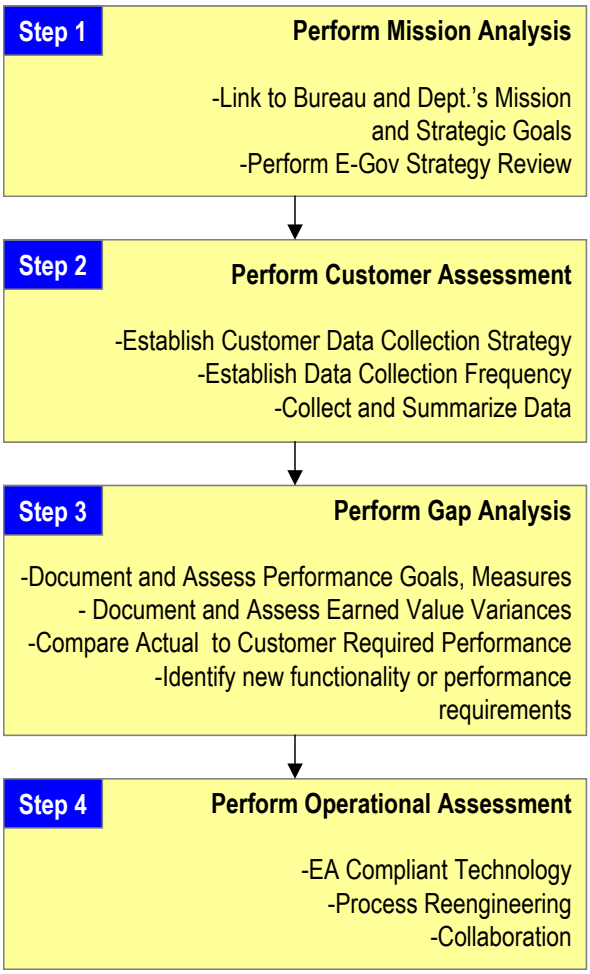
C.4 Process

The Project Sponsor must establish a schedule (annually, semi-annual or quarterly) to conduct an operational analysis. The Project Sponsor must establish a strategy to solicit user or customer input. This strategy can be a survey, focus groups or regular user group meetings. The Project Sponsor must document the schedule and strategy, and notify all users or customers of this formal and regular schedule.

Based on projected project or investment costs and benefits (e.g., cost, schedule and performance), the survey, focus group or regular user group results will determine whether the Steady State project is meeting its original or revised objectives. The results are documented in the Operational Analysis template.

Enhancements outside of the existing project scope are considered a new investment. To fund an enhancement, the Project Sponsor must enter the Pre-Select CPIC processes where alternatives to close the gap are identified, and their costs and benefits estimated.

The general OA methodology is summarized below and the actions documented in the Operational Analysis Template.



Step 1: Perform Mission Analysis. Describe how the investment supports the Bureau's and the Departments Mission, Goals, and Objectives. Establish the level of functionality and performance provided by the existing investment.

Describe also how the investment supports the DOI E-Government Strategy and the E-Government Goals, Objectives and Strategies. These are documented in the Department's E-Government Strategy 2004-2008.

Step 2: Perform Customer Assessment. Establish a strategy to document customer or user requirements. Periodic surveys, focus groups, or user group meetings are often assessed. Also examine usage trends, system reports, and change order requests – these can give insight into emerging requirements. Summarize and categorize the information into either performance needs or new functional requirements.

Step 3: Perform Gap Analysis. Report Performance and Earned Value variances based on information provided in the OMB Exhibit 300 or 300-1. Based on the Customer and User Requirements, Performance and Earned Value Variance analyses, discuss the root cause of any gap. Identify what, if any additional functionality or performance is required.

The following table summarizes example topics for consideration:

Cause of Gap or Problem	Required Functionality or Performance
Limited interoperability within Bureau, Department or Federal Government	Scalable platform to support EA compliant IT infrastructure
Non-compliance with EA	System consistent with EA
Poor data sharing and data integrity	Enterprise-based interoperable systems with shared data standards, descriptions, and relationships
Poor reliability	Modernized workstations and frequent technology refresh to maximize system reliability
Cannot meet growing demand or transaction volume	Increased capacity to meet processing, service, and mission demands
Inadequate information and computer security	Enterprise-based security authentication and or control, and strengthened IT and information security
Poor customer service	Electronic application submission and processing to improve customer service
Technical architecture not scalable	Fewer operational disruptions, reduced O&M costs
Limited legislative and regulatory compliance	Meets Congressional mandates and GAO oversight concerns

Step 4: Perform Operational Assessment. Identify solutions that can provide the needed functionality or performance. This may include designing new processes, implementing technologies compliant with the Department's Enterprise Architecture, or collaborating with other initiatives within the federal government. The system may have been targeted for replacement by our modernization blueprinting efforts.

Recommend if the existing system should be a) continued with no additional investment, b) enhanced, or c) terminated d) migrated to a similar system and retired.

OPERATIONAL REVIEW TEMPLATE

1. Administrative Information	
Investment Title	
Office	
Date of Operational Analysis	
System Manager	
System Owner	
Submission Date	
Revision Number	
Revision Date	
System Owner Signature & Date	

2. Project Description

Provide a brief summary describing the asset and a description of the business processes that the investment supports.

3. Mission Analysis

3. a. For each Bureau and Departmental mission or strategic goal that the investment supports, explain how the investment is continuing to meet Bureau and Department mission or strategic goals.

3. b. Describe how the project supports the Department's E-Government Strategy.
4. User or Customer Assessment Briefly describe the investment's users and the process (e.g., surveys, user group meetings, customer focus groups, etc.) used to assess user or customer satisfaction. Summarize the results of surveys or other user or customer inputs, and usage trends. Is the existing system providing customers the needed functionality and performance?

5. Gap Analysis

Identify the need for additional functionality and performance. Examine gaps in supporting the Bureau and Department's Mission and Strategic Goals, Technical Performance as measured by Earned Value, and results from the User or Customer Survey.

a. Performance Variance

For the prior and current fiscal year, provide the OMB Exhibit 300 Performance Goals and Measures (Section 1, Part C) table(s) with prior year actual results and current year interim results, if known. Complete Tables 1 and or Table 2 below. If the project collects, manages or reports to other performance goals and measures, add rows to record those goals and measures.

Table 1

Fiscal Year	Strategic Goal(s) Supported	Existing Baseline	Planned Performance Improvement Goal	Actual Performance Improvement Results	Planned Performance Metric	Actual Performance Metric Results
2004						
2004						
2005						
2005						

Table 2

Fiscal Year	Measurement Area	Measurement Category	Measurement Indicator	Baseline	Planned Improvements to the Baseline	Actual Results
2004						
2004						
2004						
2004						
2005						
2005						
2005						
2005						

b. User or Customer Analysis

Based on your user or customer inputs, is actual performance consistent with user or customer expectations, or do the current performance goals reflect current user or customer functional or performance requirements? Has the investment exceeded expectations, and the performance measures need to be re-baselined? Discuss how your project addresses the following operational indicators:

1) efficiency
2) effectiveness
3) maintainability
4) productivity
5) security
6) availability
7) reliability
8) energy usage

c. Earned Value Analysis

Description of Milestone	OMB-Approved Baseline					Actual Outcome			
	Schedule			Planned Cost	Funding Agency	Schedule		Percent Complete	Actual Cost
	Start Date	End Date	Duration (in days)			Start Date	End Date		

Completion date: OMB-approved baseline:	Estimated completion date:
Total cost: OMB-approved baseline:	Estimate at completion:

Earned Value Variance

Provide the following cumulative earned value data.

Cost Variance = (BCWP-ACWP) =	
Cost Variance % = (CV/BCWP) x 100% =	
Schedule Variance = (BCWP-BCWS) =	
Schedule Variance % = (SV/BCWS) x 100% =	

c.1. Earned Value Variance Analysis

If cost or schedule variances are a negative 5% or more, explain the reason for the variance. Discuss the actions that will be taken to correct the variances, the risk associated with the actions, and how close the planned actions will bring the investment to the original baseline.

c.2. Technical Performance Variance Analysis

If the performance variances are a negative 5% or more, explain the reason for the variance. Discuss the actions that will be taken to correct the variances, the risk associated with the actions, and how close the planned actions will bring the investment to the original planned improvement.

d. Gap Analyses Based on the Customer and User Requirements, Performance Analysis, and Earned Value Variance analyses, discuss the root cause of a gap, and what, if any, additional functionality or performance is required.

6. Operational Assessment
a. Opportunities Based on the Gap Analysis, identify opportunities to improve functionality, performance (effectiveness and or efficiency). These opportunities may include investing in technology compliant with the Departmental EA; business process reengineering; and or collaborating with another project. Discuss whether E-Gov initiatives can be leveraged. Describe how the project could deliver services more efficiently in a web-based environment.
b. Project Manager Recommendations Justify if the existing system should continue in operation as is, be enhanced, or terminated. If the system is to be enhanced or terminated, summarize the actions to be taken this fiscal year.
Bureau IRB Recommendation:
DOI IRB Decision:

Appendix D: Cost-Benefit Analysis

D.1 Purpose

Current laws and regulations require agencies to conduct a CBA prior to deciding whether to initiate, continue, or modify an IT investment. The level of detail required varies and should be commensurate with the size, complexity, and cost of the proposed investment.

The CBA exams the business processes that the investment will change and presents a quantifiable picture of those changed business processes. Simply put, if the changes in business operational costs and any new benefits are greater than the project costs, the investment provides a positive return on investment (ROI). The benefit to cost ratio is express as:

A = Current Costs of Business
B = Future Costs of Business
C = New Benefits
D = Project Costs

$$\frac{A-B+C}{D}$$

More information is presented later in this appendix on ROI, but at the Pre-Select Phase, a simple analysis and estimate of the potential ROI may suffice for the CBA. If the ratio is greater than 1, the investment has a positive ROI.

This appendix provides a layout of a CBA for a very large, complex, and costly IT investment. A scaled down version is appropriate for a smaller, less costly investment.

The CBA supports decision-making and helps ensure resources are effectively allocated to support mission requirements. The CBA should demonstrate that at least three alternatives were considered and the chosen alternative is the most cost-effective, within the context of fiscal and practical considerations. Possible alternatives include the following choices:

- In-house development
- Contractor development
- In-house operation
- Contractor operation
- Commercial-off-the-shelf (COTS) system
- Government-off-the-shelf (GOTS) system
- Current operational procedures (status quo)
- New operational procedures

- Alterative technical approaches

A CBA is performed for each investment alternative to enable the uniform evaluation and comparison of all alternatives.

The CBA should include comprehensive estimates of the projected benefits and costs for each alternative. Costs, tangible benefits, and intangible benefits (benefits which cannot be valued in dollars) should be included. Intangible benefits should be evaluated and assigned relative numeric values for comparison purposes. Sunk costs (costs incurred in the past) and realized benefits (savings or efficiencies already achieved) should not be considered since past experience is relevant only in helping estimate future benefits and costs. Investments should be initiated or continued only if the projected benefits exceed the projected costs. However, some mandatory systems will not provide net benefits to the government. A "least cost" analysis is performed to choose the "best" alternative from a series of solutions. In such cases, the lowest cost alternative should be selected. If functions are to be added to a mandatory system, though, the additional functions should provide benefits to the government.

D.2 Process

A CBA is completed or updated at the following lifecycle milestones:

- Proposal initiation (Pre-Select Phase)
- IRB proposal consideration (Select Phase)
- IRB initiative review (at least annually during the Control Phase)
- Initial implement (Control Phase)
- Post-Implementation Review (Evaluation Phase)
- Operations and Maintenance review (Steady State Phase)
- Annually for "major system" CPIC review.

The Project Sponsor ensures the CBA is done. The Project Sponsor can obtain expertise from the IPT in systems development and operation, budget, finance, statistics, procurement, architecture, and work processes, as needed.

The CBA process can be broken down into the following steps:

1. Determine and define objectives for the investment.
2. Document current business process
3. Estimate future business requirements
4. Collect cost data for alternatives
5. Choose at least three alternatives

6. Document CBA assumptions
7. Estimate costs
8. Estimate benefits
9. Discount costs and benefits
10. Evaluate alternatives
11. Perform sensitivity analysis
12. Compare investments.

Each of these steps is detailed in the following sections. The numerical examples provided are from a variety of sources and do not relate to one specific investment.

D.2.1. Determine or Define Objectives

The CBA should include a problem definition; pertinent background information such as staffing, system history, and customer satisfaction data; and a list of investment objectives that identify how the system will improve the work process and support the mission.

D.2.2. Document Current Business Process

The current business process should be documented and address these areas:

Existing System—Current business processes are performed by manual and or automated systems. Proposed investments should be based on re-engineered and or improved business processes. A complete understanding of the existing system and its costs to the government are required to complete a CBA.

Customer Service—Each customer's role and services required should be clearly documented and quantified, if possible (e.g., in an average month, a customer inputs two megabytes (MB) of data and spends 10 hours on database maintenance).

System Capabilities—Resources required for peak demand should be listed. For Example: 100 MBs of disk storage space and personnel to support 50 users.

System Architecture—The hardware, software, and physical facilities that will be required should be documented, including information necessary for determining system costs, expected future utility of items, and the item owner (e.g., government or contractor). **Table F-1**-displays the information desired.

Hardware	Software	Physical Facilities
Manufacturer Make or Model Year Cost Power requirements Expected life Maintenance requirements Operating characteristics (e.g., size, speed, capacity, etc.) Operating systems supported	Manufacturer Name Version number Year acquired License term Hardware requirements Cost (annual or purchase)	Location Size Capacity Structure type Availability Annual cost

Table F-1 *System Architecture Information Requirements*

System Costs—Current costs provide the CBA baseline. **Figure F-2-Cost Elements for Systems** addresses the cost elements for most systems. However, a particular system may not include all elements identified within a category and may include some activities not shown.

Cost Category	Cost Elements
Equipment, Leased or Purchased	Supercomputers, mainframes, minicomputers, microcomputers, disk drives, tape drives, printers, telecommunications, voice and data networks, terminals, modems, data encryption devices, and facsimile equipment.
Software, Leased or Purchased	Operating systems, utility programs, diagnostic programs, application programs, and commercial-off-the-shelf (COTS) software.
Commercial Services	Commercially-provided services, such as teleprocessing, local batch processing, on-line processing, Internet access, electronic mail, voice mail, Centrex, cellular telephone, facsimile, and packet switching.
Support services (Contractor Personnel)	Commercially-provided services to support equipment, software, or services, such as maintenance, source data entry, training, planning, studies, facilities management, software development, system analysis and design, computer performance evaluation, and capacity management.
Supplies	Any consumable item designed specifically for use with equipment, software, services, or support services identified above.
Personnel (compensation and benefits)	Includes the salary (compensation) and benefits for government personnel who perform IT functions. Functions include but are not limited to program management, policy, IT management, systems development, operations, telecommunications, computer security, contracting, and secretarial support. Personnel who simply use IT assets incidental to the performance of their primary functions are not included.
Intra-governmental services	All IT services within agencies, and between executive branch agencies, judicial and legislative branches, and State and local governments.

Table F-2 *Cost Elements for Systems*

D.2.3. Estimate Future Business Requirements

Future customer requirements determine the system capabilities and architecture, and ultimately affect system costs and benefits. These customer requirements provide the insight needed to estimate the future costs of business.

Future System—Re-engineered and or improved business processes will be performed by manual or automated systems in the future. A complete understanding of the requirements allows the project manager to estimate new business processes and their costs to the government. These future costs of business are necessary to complete a CBA. Each alternative may affect business processes and associated costs differently.

Items to consider include:

Lifecycle Time—Determine the system lifecycle, or when the system is terminated and replaced by a system with significant changes in processing, operational capabilities, resource requirements, or system outputs. Large, complex systems should have a lifecycle of at least five years, and no more than ten to 12 years.

Lifecycle Demands—Identify the most appropriate demand measures and use the measures to determine previous year demands, calculate the change in demand from year to year, average the demand change, and use the average to make predictions; or use expert judgment if deemed the most appropriate choice. In a complex situation, more sophisticated tools, such as time-series and regression analysis, may be needed to forecast the future.

D.2.4. Collect Cost Data

Data can be collected, from the following sources, to estimate the costs of each investment alternative:

Historical Organization Data—If contracts were used to provide system support in the past, they can provide the estimated future cost of leasing and purchasing hardware and hourly rates for contractor personnel. Contracts for other system support services can provide comparable cost data for the development and operation of a new system.

Current System Costs—Current system costs can be used to price similar alternatives.

Market Research—Quotes from multiple sources, such as vendors, Gartner Group, IDC Government, and government-wide agency contracts (GWACS), can provide an average, realistic price.

Publications—Trade journals usually conduct annual surveys that provide general cost data for IT personnel. Government cost sources include the General Services Administration (GSA) pricing schedule and the OMB Circular A-76, "Performance of Commercial Activities" supplemental listing of inflation and tax rates.

Analyst Judgment—If data is not available to provide an adequate cost estimate, the CBA team members can use judgment and experience to estimate costs. To provide a check against the estimates, discuss estimated costs with other IT professionals.

Special Studies—Special studies can be conducted to collect cost data for large IT investments. For example, the Federal Aviation Administration (FAA) used three different in-house studies to provide costs for software conversion, internal operations, and potential benefits. These data sources became the foundation for a CBA.

D.2.5. Choose at Least Three Alternatives

A CBA should present at least three viable alternatives; Each viable approach should be included as an alternative. However, the number of technical approaches may be limited if only one or two are compatible with the architecture or if some approaches are not feasible for reasons other than costs and benefits. Consider non-IT alternative to mission accomplishment.

D.2.6. Document CBA Assumptions

Document assumptions and justify them. This is an opportunity to explain why some alternatives are not included. If an alternative is eliminated because it is not feasible, the assumption should be clearly explained and justified.

D.2.7. Estimate Costs

Many factors should be considered during the process of estimating costs for alternatives. Full lifecycle costs for each competing alternative should be included, and the following factors should be addressed:

Activities and Resources—Identify and estimate the costs associated with the initiation, design, development, operation, and maintenance of the IT system.

Cost Categories—Identify costs in a way that relates to the budget and accounting processes. The cost categories should follow current DOI object class codes.

Personnel Costs—Personnel costs are based on the guidance in OMB Circular A-76, "Supplemental Handbook, PART II-Preparing the Cost Comparison Estimates." Government personnel costs include current salary by location and grade, fringe benefit factors, indirect or overhead costs, and General and Administrative costs.

Depreciation—The cost of each tangible capital asset should be spread over the asset's useful life (e.g., the number of years it will function as designed). OMB prefers that straight-line depreciation be used for capital assets.

Annual Costs—All cost elements should be identified and estimated for each year of the system lifecycle. This is necessary for planning and budget considerations **Table D-3**—illustrates the cost estimates for an investment initiation activity.

Activities/ Cost Categories	Problem Definition	Work Process Evaluation	Requirements Definition	Security Plan	Performance Measures	Cost-Benefit Analysis	Total
Hardware							
Software							
Services							
Support Services		10,000	4,000	1,000	6,000	3,000	24,000
Supplies		100	100	0	100	100	400
Personnel	5,000	10,000	6,000	500	5,000	8,000	34,500
Inter-Agency Services							
Total	**5,000**	**20,100**	**10,100**	**1,500**	**11,100**	**11,100**	**58,900**

Table D-3 *Sample Cost Estimates for an Investment Activity*

The costs for each year can be added to provide the estimated annual costs over the investment's life. For example, **Table D-4-Sample System Lifecycle Cost Estimates** provides the total estimated costs for a 10-year investment. In the first year, in-house staff and contractors define the problem, evaluate the work process, define processing requirements, prepare the CBA, develop a request for proposals (RFP), and issue a contract for the system development. In the second year, a contractor designs and implements the system. The next eight years reflect operational and maintenance costs for equipment, software, in-house personnel, and contractor personnel. Years five and six also reflect in-house acquisition costs for establishing a new five-year contract for system maintenance and help desk support.

Year	Startup	Acquisition	Development	Operation	Maintenance	Total
1	100,000	100,000				200,000
2			800,000			800,000
3				200,000	80,000	280,000
4				200,000	60,000	260,000
5		50,000		200,000	50,000	300,000
6		50,000		200,000	50,000	300,000
7				200,000	40,000	240,000
8				200,000	30,000	230,000
9				200,000	30,000	230,000
10				200,000	30,000	230,000
Total	**100,000**	**200,000**	**800,000**	**1,600,000**	**370,000**	**3,070,000**

Table D-4 *Sample System Lifecycle Cost Estimates*

D.2.8. Estimate Benefits

The following six activities are completed to identify and estimate the value of benefits:

Define Benefits—Benefits are the services, capabilities, and qualities of each alternative, and can be viewed as the return from an investment. Benefits are based on the changed business processes. The following questions will help define benefits for IT systems and enable alternative comparisons:

Accuracy—Will the system improve accuracy by reducing data entry errors?

Availability—How long will it take to develop and implement the system?

Compatibility—How compatible is the proposed alternative with existing procedures?

Efficiency—Will one alternative provide faster or more accurate processing?

Maintainability—Will one alternative have lower maintenance costs?

Modularity—Will one alternative have more modular software components?

Reliability—Does one alternative provide greater hardware or software reliability?

Security—Does one alternative provide better security to prevent fraud, waste, or abuse?

Workforce—Will the system reduce the number of employees performing the business process, or allow the same employees to do work more efficiently?

Identify Benefits—Every proposed IT system should have identifiable benefits for both the organization and its customers. Organizational benefits could include flexibility, organizational strategy, risk management, organizational changes, and staffing impacts. Customer benefits could include improvements to the current IT services and the addition of new services. Customers should help identify and determine how to measure and evaluate the benefits.

Establish Measurement Criteria—Establishing measurement criteria for benefits is crucial because the Government Performance and Results Act (GPRA) and the Clinger-Cohen Act (CCA) emphasize tangible measures of success (benefits) related to the organization's overall mission and goals. See **Appendix G-Performance Measurement** for guidance on how to develop performance measures.

Classify Benefits—Benefits that are capable of being appraised at an actual or approximate value are called tangible benefits. Benefits that cannot be assigned a dollar value are called intangible benefits.

Estimate Tangible Benefits—The dollar value of benefits can be estimated by determining the fair market value of the benefits. An important economic principle used in estimating public benefits is the market value concept.

Market value is the price that a private sector organization would pay to purchase a product or service

Quantify Intangible Benefits—Intangible benefits can be quantified using a subjective, qualitative rating system. As an example, a qualitative rating system might evaluate potential benefits against the following:

- Provides Maximum Benefits (2 points)
- Provides Some Benefits (1 point)
- Provides No Benefits (0 points)
- Provides Some Negative Benefits (-1 point)
- Provides Maximum Negative Benefits (-2 points)

Once the rating system is selected, each benefit is evaluated for each alternative. This should be done by a group of three to five individuals familiar with the current IT system and the alternatives being evaluated. The numerical values assigned to the ratings then can be summed and averaged to obtain a score for each benefit. **Table D-5**—shows the scores for benefits A to D from four reviewers using a scale of 1 to 5.

Benefit	Reviewer 1 Score	Reviewer 2 Score	Reviewer 3 Score	Reviewer 4 Score	Reviewer Average Score
A	5	4	3	5	4.25
B	4	2	3	4	3.25
C	3	2	5	4	3.50
D	4	3	2	2	2.75

Table D-5 *Sample Reviewer Scores for Intangible Benefits*

An option that can be used in a qualitative assessment is to "weight" each benefit criteria with regard to importance. The more important the benefit, the higher the weight it carries. The advantage of weighting is the more important benefits have a greater influence on the benefit analysis outcome. The weighting scale can vary between any two predetermined high and low weights. An example of calculating a weighted score is provided in **Table F-6**—and demonstrates using weighting factors makes Alternative 1 the clear winner.

Benefit	Alternative 1 Raw Score	Alternative 2 Raw Score	Weighting Factor	Alternative 1 Weighted Score	Alternative 2 Weighted Score
A	4	2	10	40	20
B	3	2	9	27	18
C	4	3	8	32	24
D	2	3	6	12	18
E	3	4	5	15	20
Total	**16**	**14**	**38**	**126**	**100**

Table D-6 *Sample Weighted Benefits Score*

D.2.9. Discount Costs and Benefits

After costs and benefits for each system lifecycle year have been identified, convert them to a common measurement unit by discounting future dollar values and transforming future benefits and costs to their "present value." Present values are calculated by multiplying the future value times the discount factors published in the OMB Circular A-94.

Table D-7—shows annual costs and benefits for a system lifecycle, along with the discount factor, the discounted costs and benefits (present values), and the Net Present Value present value [NPV]. The discounted costs and benefits are computed by multiplying costs and benefits by the discount factor. The net benefit without discounting is $380,000 ($3,200,000 minus $2,820,000) while the discounted NPV is less than $60,000 because the biggest costs are incurred in the first two years, while the benefits are not accrued until the third year. When evaluating costs and benefits, you should be cautious of returns that accrue late in the investment's lifecycle. Due to discounting, benefits that accrue in later years do not offset costs as much as earlier-year benefits. Also, these later-year benefits are less certain. Both the business and IT environments may experience significant changes before these later-year benefits are realized.

Year	Annual Cost (AC)	Annual Benefit (AB)	Discount Factor (DF)	Discounted Cost (DC) ACxDF	Discounted Benefit (DB) ABxDF	Discounted Net (NPV) DB - DC
1	150,000		0.9667	145,005		(145,005)
2	600,000		0.9035	542,100		(542,100)
3	280,000	400,000	0.8444	236,432	337,760	101,328
4	260,000	400,000	0.7891	205,166	315,640	110,474
5	300,000	400,000	0.7375	221,250	295,000	73,750

6	300,000	400,000	0.6893	206,790	275,720	68,930
7	240,000	400,000	0.6442	154,608	257,680	103,072
8	230,000	400,000	0.6020	138,460	240,800	102,340
9	230,000	400,000	0.5626	129,398	225,040	95,642
10	230,000	400,000	0.5258	120,934	210,320	89,386
Total	**2,820,000**	**3,200,000**		**2,100,143**	**2,157,960**	**57,817**

Table D-7 *Sample Discounted Lifecycle Costs and Benefits*

D.2.10. Evaluate Alternatives

Many benefits cannot easily be quantified in dollar terms. As a result, evaluating alternatives cannot always be done using present values, but valid evaluations can be made using a combination of dollar values and quantified relative values (values that are numeric, but do not represent dollar values).

Evaluate All Dollar Values—Once all the costs and benefits for each competing alternative have been assigned dollar values and discounted, the NPV of the alternatives should be compared and ranked. When the alternative with the lowest discounted cost provides the highest discounted benefit, it is the clear winner, as shown in **Table D-8**—.

Alternative	Discounted Cost (DC)	Discounted Benefit (DB)	Net Present Value (NPV) (DB - DC)	Benefit-Cost Ratio (DB/DC)
1	1,800,000	2,200,000	400,000	1.22
2	1,850,000	1,750,000	(-100,000)	0.95
3	2,000,000	2,000,000	0	1.00
4	2,200,000	2,100,000	(-100,000)	0.95

Table D-8 *Sample Investment Comparison (Lowest Cost System Provides Highest Benefit)*

Net Present Value—There will probably be very few cases where the alternative with the lowest discounted cost provides the highest discounted benefit. The next number to consider is the Net Present Value (Discounted Benefit minus Discounted Cost). If one alternative clearly has the highest Net Present Value, it is considered the best alternative; however, it is usually advisable to look at other factors.

Benefit-Cost Ratio—When the alternative with the highest Net Present Value present value is not a clear winner, the benefit-cost ratio or BCR (discounted benefit divided by discounted cost) may be used to differentiate between alternatives with very similar or equal Nets. In **Table D-9**—Alternative 4 would be the winner because it has a higher BCR than Alternative 5. Alternatives 4 and 5 are clearly superior to other alternatives because they have the highest Net Present Value.

Evaluate With Intangible Benefits—When all the benefits are intangible, evaluation will be based on quantifying relative benefits.

Alternative	Discounted Cost (DC)	Discounted Benefit (DB)	Net Present Value (DB-DC)	Benefit-Cost Ratio (DB/DC)
1	1,500,000	1,600,000	100,000	1.07
2	1,600,000	1,750,000	150,000	1.09
3	1,900,000	2,000,000	100,000	1.05
4	2,000,000	2,450,000	450,000	1.23
5	3,000,000	3,450,000	450,000	1.15

Table D-9 *Sample Investment Comparison (Other Than Lowest Cost System Provides Highest Benefit)*

D.2.11. Perform Sensitivity Analysis

Sensitivity analysis tests the sensitivity of input parameters and the reliability of the CBA result. Sensitivity analysis should assure reviewers the CBA provides a sound basis for decisions. The sensitivity analysis process requires the following:

Identify Input Parameters—The assumptions documented earlier in the CBA are used to identify the model inputs to test for sensitivity. Good inputs to test are those that have significant (large) cost factors and a wide range of maximum and minimum estimated values. Listed below are some common parameters:

- System requirement definition costs
- System development costs
- System operation costs
- Transition costs, especially software conversion
- System lifecycle
- Peak system demands.

Repeat the Cost Analysis—For each parameter identified, determine the minimum and maximum values. Then, choose either the minimum or maximum value as the new parameter value (the number selected should be the one that most differs from the value used in the original analysis). Repeat the CBA with the new parameter value and document the results. Prepare a table like **Table D-10**—to summarize the different outcomes and enable the results to be quickly evaluated.

Parameter	Parameter Value	Best Alternative
Development Cost ($)	1,500,000 2,000,000 2,500,000	A A B
Transition Costs ($)	100,000 200,000	A A

System Lifecycle (Years)	5 10 15	A B C
Benefits ($)	1,500,000 2,250,000 3,000,000	A A B

Table D-10 *Sample Sensitivity Analysis*

Evaluate Results—Compare the original set of inputs and the resulting outcomes to the outcomes obtained by varying the input parameters. In the previous table, the original values are the first value listed for each parameter. Sensitivity is measured by how much change in a parameter is required to change the alternative selected in the original analysis. The sensitivity guidelines include the following:

- A parameter is not considered sensitive if it requires a decrease of 50 percent or an increase of 100 percent to cause a change in the selected alternative.
- A parameter is considered sensitive if a change between 10 and 50 percent causes a change in the selected alternative.
- A parameter is considered very sensitive if a change of 10 percent or less causes a change in the selected alternative.

In the previous example, the analysis would appear to be somewhat sensitive to the development costs, but not sensitive to the transition costs and benefits.

D.2.12. Compare Investments

Even if the CBA shows that benefits will outweigh costs, using Payback Period and Return on Investment (ROI) analysis help demonstrate an investment is a better utilization of funds than other proposed investments.

Table D-11—illustrates that the money invested in the system's development, installation, and operation is not offset by the benefits until the 10th year. In other words, the payback period for the system is 10 years, which is generally unacceptable, making it difficult for this investment to obtain funding.

Year	Annual Cost (AC)	Annual Benefit (AB)	Discount Factor (DF)	Discounted Cost (DC) ACxDF	Discounted Benefit (DB) ABxDF	Net Present Value DB - DC	Cumulative Net Present Value
1	150,000		0.9667	145,010	0	(145,010)	(145,010)
2	600,000		0.9035	542,095	0	(542,095)	(687,106)
3	280,000	400,000	0.8444	236,428	337,754	101,326	(585,779)
4	260,000	400,000	0.7891	205,178	315,658	110,480	(475,299)
5	300,000	400,000	0.7375	221,256	295,007	73,751	(401,547)
6	300,000	400,000	0.6893	206,781	275,708	68,927	(332,620)

7	240,000	400,000	0.6442	154,603	257,671	103,068	(229,552)
8	230,000	400,000	0.6020	138,468	240,814	102,346	(127,206)
9	230,000	400,000	0.5626	129,409	225,060	95,651	(31,556)
10	230,000	400,000	0.5258	120,943	210,336	89,393	57,837
Total	**2,820,000**	**3,200,000**		**2,100,171**	**2,158,008**	**57,837**	

Table D-11 *Sample Payback Period*

Return on Investment—ROI is often used when comparing proposed investments. Total Net Present Value (Total Discounted Benefits minus the Total Discounted Costs) is often referred to as the return or profit from an investment. ROI is calculated by dividing the Total Net Present Value by the Total Discounted Cost. In the figure above, ROI is the Total Net Present Value ($57,837) divided by Total Discounted Costs ($2,100,171) and equals 0.0275. Since ROI is often cited as a percentage, multiplying by 100 converts the decimal rate to 2.75.

The ROI is really just another way to express the BCR. In the example above, the BCR is the Total Discounted Benefit ($2,158,008) divided by the Total Discounted Costs ($2,100,171) and equals 1.0275. The 1.0275 can also be expressed as 102.75 percent. This means that the benefits are 2.75 percent greater than the costs. Compute the ROI by subtracting 1 from the BCR.

The ROI must also be adjusted for risk. To adjust ROI for risk, use the process described for calculating the risk factor described in Appendix G.2. The "risk factor" for all risks should be totaled and added to the investment cost. Adjusting the ROI for risk will aid in comparing alternatives with different potential risk levels and will help ensure that returns for investments with higher risk potential are fully understood. (See **Appendix E: Risk Management** for a more detailed discussion on risk analysis.)

Appendix E: Risk Management

E.1 Purpose

A risk is an uncertain event of condition that, if it occurs, has a positive or negative affect on a project objective. Risk, is one of those words that immediately conjure up an image of something bad, but it is important to remember that risk can also provide positive benefits as well as negative ones.

Risk management is the systematic process of identifying, analyzing and responding to project risk. We want to maximize the probability and impact of any positive risk factors and minimize the probability and impact of those that might negatively affect the project.

The need to manage risk increases with the complexity of the investment. It is an ongoing process that requires continuous risk identification, assessment, planning, and monitoring.

E.2 Process

The Risk Management process includes two phases:

Risk assessment involves identifying, analyzing and prioritizing risks; and

Risk response involves developing and planning risk response strategies, executing those plans, evaluating the results of the responses and documenting the results.

There are several ways that a Project Manager may choose to manage or respond to a specific risk. These options can be categorized into three broad areas:

Avoid the specific threat, usually by eliminating the cause. (e.g.; conduct a study or develop a prototype)

Mitigate the specific threat by reducing the expected monetary or schedule impact of the risk, or by reducing the probability of its occurrence.

Manage (accept) the consequences of the risk.

Risk management activities need to be balanced. The magnitude of the effort required to identify, assess, manage, and monitor risks, must be commensurate with the magnitude of the potential impact to the project. Making informed decisions by consciously assessing what could go wrong, as well as the likelihood and the severity of the impact is at the heart of risk management.

1. Risk Assessment

It is the responsibility of everyone associated with an investment to identify and document risks. A risk identification process should be identified, communicated and supported.

Table E-1 provides a means by which risk identification can be easily captured, documented, and analyzed.

Risk Priority	Risk Category	Date Identified	Risk Description	Overall Risk Rating *(h-m-l)*	Risk Response Strategy	Status

Table E-1 *Example of Risk Management Table*

Each risk must be:

- Described as completely as possible
- Identified by phase or stage, along with who identified the risk, the date it was identified, and who was assigned as the primary point of contact
- Analyzed for its probability of occurrence (high, medium, low)
- Analyzed in terms of impact to the project schedule and budget
- Given an overall risk (severity) rating (high, medium, low);
- Categorized within the mandatory and optional areas of risk as identified by OMB
- Prioritized among all identified risks.

2. Risk Response Development and Control

After all risks have been identified, rated and categorized, each risk is then prioritized. Not all risks identified will be carried into the risk plan for mitigation and management. Project managers should establish a pragmatic cut-off that is consistent with the scope of the project. Each significant risk must then include a description of the risk response strategy and activities. The risks must then be categorized by strategy - eliminate, mitigate, or manage.

The risk management plan provides a means by which risks can be easily tracked and managed. It identifies the priority, area of risk, description, overall rating, risk response strategy category, and status (new, increasing, static, decreasing, or eliminated). The risk management plan will be used to track and communicate risk response activities, their status and their potential impact on the schedule and budget.

3. Common Areas of Risk

The following common areas of risk are consistent with OMB Circular A-11 risk requirements. There are either, mandatory or optional categories, all areas of risk should be addressed in the risk management plan. Below are some examples of risks included in each category.

MANDATORY RISK AREAS — at least one risk must be identified, rated and prioritized, and include a risk response strategy in each of the following risk areas.

Technology — Lack of expertise, software and hardware maturity or immaturity, installation requirements, customization, O&M requirements, component delivery schedules availability, uncertain and or changing requirements, design errors and or omissions, technical obsolescence.

Project Schedule and Resources — Scope creep, requirements changes, insufficient or unavailable resources, overly optimistic task durations, unnecessary activities within the schedule, critical deliverables or reviews not planned into the schedule.

Business —Poorly written contracts, market or industry changes, new competitive products become available, creating a monopoly for future procurements.

Organizational and Change Management — Business process re-engineering acceptance by users and management, time and commitment managers will need to spend overseeing the change, lack of participation of business owners in the re-engineering process, necessary change in manuals and handbooks, personnel management issues, labor unions.

Strategic — Project does not tie to Department's mission or strategic goals, project is not part of the Department's IT Capital Planning and Investment Control (CPIC) process.

Security — Project does not conform to the requirements of OMB Circular A-130.

Privacy — Project does not conform to the requirements of OMB Circular A-130.

Data — Data standards not defined, data acquisition and or conversion cost are unknown.

OPTIONAL RISK AREAS — other areas of risk that should be considered, but are not mandatory to address.

- Integration Risks
- Project Team Risks
- Requirements Risks
- Cost Risks
- Project Management Risks.

Appendix F: Performance Measurement

F.1 Purpose

Performance measurement is the process whereby an organization establishes the parameters to measure how programs, investments, and acquisitions are reaching the desired results in support of mission goals. Performance measures are set during the Select Phase and assessed during subsequent phases. The focus of performance measurement is on outcomes, or how well the IT investment enables the program or Department to accomplish its primary mission. Consequently, performance measurement should look beyond measures of input (resource consumption), activities (milestones), and output (production numbers), which are more directly related to operational performance. This focus, however, does not imply that input, activity, and output measures are not useful. Indeed, internal measures are used to track resources and activities and make necessary adjustments since investments are only successful if hardware, software, and capabilities are delivered on time and meet specifications.

To be useful, performance measure must evaluate the proper activities. It is therefore vital that performance measures be aligned to the goals of any investment to the outcomes specified in the Department's Strategic Plan, and to the Interior Enterprise Architecture.

Performance is evaluated using two criteria—effectiveness and efficiency. Effectiveness demonstrates that an organization is doing the correct things, while efficiency demonstrates that an organization is doing things optimally. New acquisitions and upgrades should include an Exhibit 300 or 300-1 business case indicating the investment will result in effectiveness or efficiency improvements. For example, a new computer network might result in enhanced efficiency because work is processed faster, digital images are transferred among remote sites, or messages are transmitted more securely.

Some questions that facilitate performance measure development include:

- What product will be produced, shared, or exchanged?
- Who will use the results?
- What decisions or actions will result from delivery of products from this system?

Answers to these questions will help Project Managers develop effective performance measures with the following characteristics:

- Strategically relevant
- Directed to factors that matter and make a difference

- Promote continuous and perpetual improvement
- Focus on the customer
- Agreed to by stakeholders.
- Short, clear, and understandable
- Meaningful.
- Realistic, appropriate to the organizational level, and capable of being measured.
- Valid
    - Link to activity and provide a clear relationship between cause and effect
    - Focus on managing resources and inputs, not simply costs
    - Discarded when utility is lost or when new, more relevant measures are discovered.

OMB has developed a Performance Reference Model (PRM) as part of the Federal Enterprise Architecture. The PRM contains a set of performance measures that can be tailored to fit the specific Departmental needs and a framework for using them. These performance measures are categorized into four broad areas: mission & business results, customer results, processes & activities, and technology. This model should be used to develop specific investment performance measures.

For example: DOI's E-Government Program has two tiers of performance measures; the top tier (program level performance measures) presents metrics that indicate the overall performance of the E-Government program. The measures listed in this tier were derived from the Departmental Strategic Plan, Interior's E-Government priorities, and the PRM. The DOI IRB will apply these metrics annually, at a minimum, as they assess the effectiveness of E-Government efforts across Interior. The results will be used to shape the annual refinement of the E-Government Strategy. The table below shows the measures as they map to the goals of the Departmental Strategic Plan. This table also categorizes the measures into those evaluating mission impact and those evaluating the success of governance and coordination.

Table: E-Gov Program Performance Measures (Mapped to DOI Strategic Plan)

Performance Measures	Link to Goals of the Departmental Strategic Plan	Category
Business manager satisfaction with E-Government solutions.	Strategic Goals of all mission areas	Mission Impact
IT spending as %of Interior budget (benchmark)	Management Excellence: End Outcome Goal 4 (Integration)	Governance and Coordination
% of GPEA transactions that are GPEA compliant.	Management Excellence: PMA Strategy 4 (E-Government)	Mission Impact
% of systems that serve multiple Bureaus	Management Excellence: End Outcome Goal 4 (Integrations)	Governance and Coordination
% of capital investments fully compliant with the CPIC process	Management Excellence: PMA Strategy 4 (E-Government)	Governance and Coordination
% system availability	Management Excellence: End Outcome Goal 3 (Modernization)	Mission Impact
% of systems certified and accredited	Management Excellence: End Outcome Goal 3 (Modernization)	Governance and Coordination
% of major IT projects that are within 10% of schedule and cost	Management Excellence: PMA Strategy 4 (E-Government)	Governance and Coordination
% external customers satisfied with IT Services of the Department	Management Excellence: End Outcome Goal 5 (Customer Value)	Mission Impact
# of web hits	Management Excellence: End Outcome Goal 3 (Modernization)	Mission Impact

F.2 Process

Outcome-based performance measures are developed through a series of steps. It is important to understand that developing measures is only one part of the more comprehensive process. After measures are developed, baseline information is gathered if it does not already exist, and performance information is collected, analyzed, interpreted, and used throughout the investment's life. These steps require a commitment of management attention and resources.

The following five steps are recommended to establish performance measures:

1. Analyze how the investment supports the mission goals and objectives and reduces performance gaps
2. Develop IT performance objectives and measures that characterize success
3. Develop collection plan and collect data
4. Evaluate, interpret, and report results
5. Review process to ensure it is relevant and useful.

Steps one to three are completed during the Pre-Select and Select Phases. Steps four and five are completed during the Control Phase, with follow-up during the Evaluate and Steady State Phases. Each of these process steps is defined in the following sections.

1. Analyze How the Investment Supports the Mission and Reduces Performance Gaps

Effective outcome-based performance measures are derived from the relationship between the new investment and how users will apply investment outputs. Specifically, the users' mission and critical success factors (those activities and outputs that must be accomplished if users are to achieve their mission) must be clearly understood. The critical element of this step is linking proposed and in-process IT investments and activities to the user mission and critical success factors.

This concept is often described as a method of strategically aligning programs and support functions with the Department's mission and strategic priorities. The first step in effectively developing outcome-based IT performance measures is to identify the organization's mission, the critical tasks necessary to achieve the mission, and the strategies that will be implemented to complete those tasks. One structured method of accomplishing this step is to develop a Logic Model linking the mission to IT performance measures.

Answers to the following questions will aid logic model development:

Identify the system.

- What will the system do?
- What are major functions or features that the system will provide (for example, what functionality or information)?
- Is this system a stand-alone system or is it used or integrated with another system?
- What is the purpose of that system?
- How is it used?

What aspects of the system, service, and information quality are needed for the system to perform optimally or acceptably?

Identify who will use the system. What is the principal business task they perform? How will using the system help them with that task?

How does completion of that task contribute to a business function?

How does completion of the business function contribute to achievement of program goals?

How does completion of program goals contribute to organizational goals?

How does completion of organizational goals contribute to Departmental goals?

Determine whether there are related IT investments that impact the mission area and goal(s) selected. Understand the relationships between various IT investments that address the same or similar needs. This will help identify potential areas for consolidation.

Once the mission is clearly defined, a gap analysis is performed to understand how IT can improve mission performance. The analysis begins with the premise that IT will improve effectiveness, efficiency, or both. To accomplish this, requirements are defined and the following questions are answered:

- Why is this application needed?
- How will the added functionality help users accomplish the mission?
- How will the added functionality improve day-to-day operations and resource use?

The investment initiation and requirement documentation also describes gaps between the current and future mission and strategy in terms of how overall efficiency and effectiveness will be improved. Project managers assist users in developing a baseline measurement of the current IT use and in comparing the baseline to the business objective to identify gaps. This analysis defines the investment need as the basis for determining what success will look like (e.g., the investment is successful when the gap is reduced by "x" amount).

2. Develop IT Performance Measures that Characterize Success

Well-designed performance measures define success parameters for the IT initiative. The following questions should be asked for each performance measure and answered affirmatively before deploying the measure:

Is it useful for monitoring progress and evaluating the degree of success?

Is it focused on outcomes that stakeholders will clearly understand and appreciate?

Is it practical? Does it help build a reliable baseline and cost-effectively collect performance data at periodic intervals?

Can the performance measure be used to determine the level of investment risk and whether the investment will meet performance targets?

Answering these questions affirmatively results in an agreement that the IT investment, by supporting improvements identified earlier, will support organizational goals and objectives. Additionally, it will help limit the number of performance measures and focus management attention on the requirements that have the greatest priority or impact. After three to five major requirements have been identified, the following questions are asked:

What are the performance indicators for each major requirement?

How well will those outputs satisfy the major requirements?

What additional steps must be taken to ensure outputs produce intended outcomes?

How does this IT investment improve capabilities over the current method?

Once requirements to be measured are identified, determine when each requirement is met. Some requirements may need to be changed if they are too difficult to measure. Or, if the requirement has indirect rather than direct outcomes, it may be necessary to use "surrogate" performance measures that mirror actual outcomes. For example, it is difficult to measure the direct benefit of computer-based training (CBT) systems. In this case, a surrogate measure might be the percentage of staff achieving certifications through the CBT with implications that certified staff are more desirable than non-certified staff because they have demonstrated initiative and are more proficient.

Of the possible performance indicators, select one or more to report performance against each requirement. One performance indicator may provide information about more than one requirement. The objective is to select the fewest number of performance indicators that will provide adequate and complete information about progress.

Selecting the fewest performance indicators necessary is important because data collection and analysis can be costly. The cost is acceptable if the benefit of the information received is greater than the cost of performance measurement, and if the data collection does not hinder accomplishment of primary missions. Costs are calculated by adding the dollars and staff time and effort required to collect and analyze data. When calculating costs, you must consider whether they are largely confined to initial or up-front costs, or will occur throughout the IT lifecycle. For example, the cost of developing and populating a database may have a large initial cost impact but diminish significantly for later maintenance. Answers to the following questions will help to determine the cost of tracking a specific performance indicator:

- What data are required to calculate the performance measure?
- Who collects the data and when?
- What is the verification and validation strategy for the data collection?

- What is the method to ensure the quality of the information reported?

In addition to determining costs, it is also necessary to determine the baseline performance, target performance, and expected time to reach the target. The baseline value is the start point for future change. If performance measures are currently in use, the data collected can provide the baseline. Otherwise the manager must determine the baseline by a reasonable analysis method including the following:

- Benchmarks from other agencies and private organizations
- Initial requirements
- Internal historical data from existing systems
- Imposed standards and requirements.

To determine the target value, obtain stakeholder agreement regarding the quantifiable benefits of the new system. These targets may be plotted as a function over time, especially for IT investments that are being installed or upgraded or as environmental factors change.

3. Develop Collection Plan and Collect Data

To ensure performance data is collected in a consistent, efficient, and effective manner, it is useful to develop and publish a collection plan so all participants know their responsibilities and can see their contributions. The collection plan details the following items:

- Activities to be performed
- Resources to be consumed
- Target completion and report presentation dates
- Decision authorities
- Individuals responsible for data collection.

In addition, the collection plan answers the following questions for each performance measure:

- How is the measurement taken?
- What constraints apply?
- Who will measure the performance?
- When and how often are the measurements taken?
- Where are the results sent and stored, and who maintains results?
- What is the cost of data collection?

While costs should have been considered during the previous step, the actual cost will be more evident at this stage. Excessively costly performance measures may require project managers to find a different, less costly mix of performance measures for the IT investment. Or it may be necessary to

creatively collect the measures to reduce collection cost. For example, a sampling may produce sufficiently accurate results at significantly less cost than counting every occurrence, and some results can be automatically generated by the system and accessed through a standard report.

To ensure data is being collected in a cost-effective and efficient manner, it is important to ensure the data collectors are involved in developing performance measures. The collectors will do a much better job if they believe the performance measures are valid and useful, and they will have insight regarding the best way to collect the data.

4. Evaluate, Interpret, and Report Results

Performance measures are useful in monitoring the investment against expected benefits and costs. To evaluate performance, data is compiled and reported according to the collection plan that was previously constructed. The data is then evaluated and the following questions are answered regarding the collected data and the investment's performance:

- Did the investment exceed or fall short of expectations? By how much and why?
- If the data indicates targets are successfully reached or exceeded, does that match other situational perceptions?
- What were the unexpected benefits or negative impacts to the mission?
- What adjustments can and should be made to the measures, data, or baseline?
- What actions or changes would improve performance?

This evaluation reveals any needed adjustments to the IT investment or performance measures. It also helps surface any lessons learned that could be fed back to the investment management process.

5. Review Process to Ensure It Is Relevant and Useful

Performance measures provide feedback to managers and help them make informed decisions on future actions. To ensure that performance measures are still relevant and useful, answer the following questions:

Are the measures still valid?

- Have higher-level mission or IT investment goals, objectives, and critical success factors changed
- Are threshold and target levels appropriate in light of recent performance and changes in technology and requirements?
- Can success be defined by these performance measures?
- Can improvements in mission or operations efficiency be defined by the measures?

- Have more relevant measures been discovered?

Are the measures addressing the right things?

- Are improvements in performance of mission, goals, and objectives addressed?
- Are all objectives covered by at least one measure?
- Do the measures address value-added contributions made by overall investment in IT and or individual programs or applications?
- Do the measures capture non-IT benefits and customer requirements?
- Are costs, benefits, savings, risks, or ROI addressed?
- Do the measures emphasize the critical aspects of the business?
- Are measures linked to a specific and critical organizational process?

Are the measures the right ones to use?

- Are measures targeted to a clear outcome (results rather than inputs or outputs)?
- Are measures understood at all levels that must evaluate and use them?
- Do the measures support effective management decisions and communicate achievements to internal and external stakeholders
- Are measures accurate, reliable, valid, and verifiable?
- Are measures built on available data at reasonable costs and in an appropriate and timely manner for the purpose?
- Are measures able to show interim progress?

Are measures used in the right way?

- Are measures used in strategic planning (e.g., to identify baselines, gaps, goals, and strategic priorities) or to guide prioritization of program initiatives?
- Are measures used in resource allocation decisions and task, cost, and personnel management?
- Are measures used to communicate results to stakeholders?

Appendix G: Project Management

G.1 Purpose

Project Management is a crucial element for IT investment success. It involves executing the necessary skills and management practices to ensure successful investment development and implementation. This integrated skill set addresses such areas as project planning, scope management, cost, schedule, performance, risk, and organizational management. The Project Manager is ultimately responsible for the investment's success and ensuring the investment delivers the functionality and capabilities expected by stakeholders (e.g., users, customers, and senior leaders.) Perhaps the greatest project management challenge is the development of a realistic risk-adjusted plan that can be executed successfully in scope, on schedule and within budget.

DOI's project management (PM) practice and competency policies are based on the ANSI/PMI/99-001-200 standard Project Management body of Knowledge (PMBOK®) and the Office of Management and Budget (OMB)-Federal chief Information Officers Councils (OCIO) guidance on information technology (IT) project management. The PMBOK describes and recognizes nine management areas that are generally accepted as PM professional practices. Listed below are the nine management (knowledge) areas:

1. Integration Management
2. Scope Management
3. Time Management
4. Cost Management
5. Quality Management
6. Human Resource Management
7. Communication Management
8. Risk Management
9. Procurement Management

When optimized, the CPIC and Project Management processes come together as described in the following section titled; Relationship of Project Management to Investment Management.

G.1 Relationship of Project Management to Investment Management

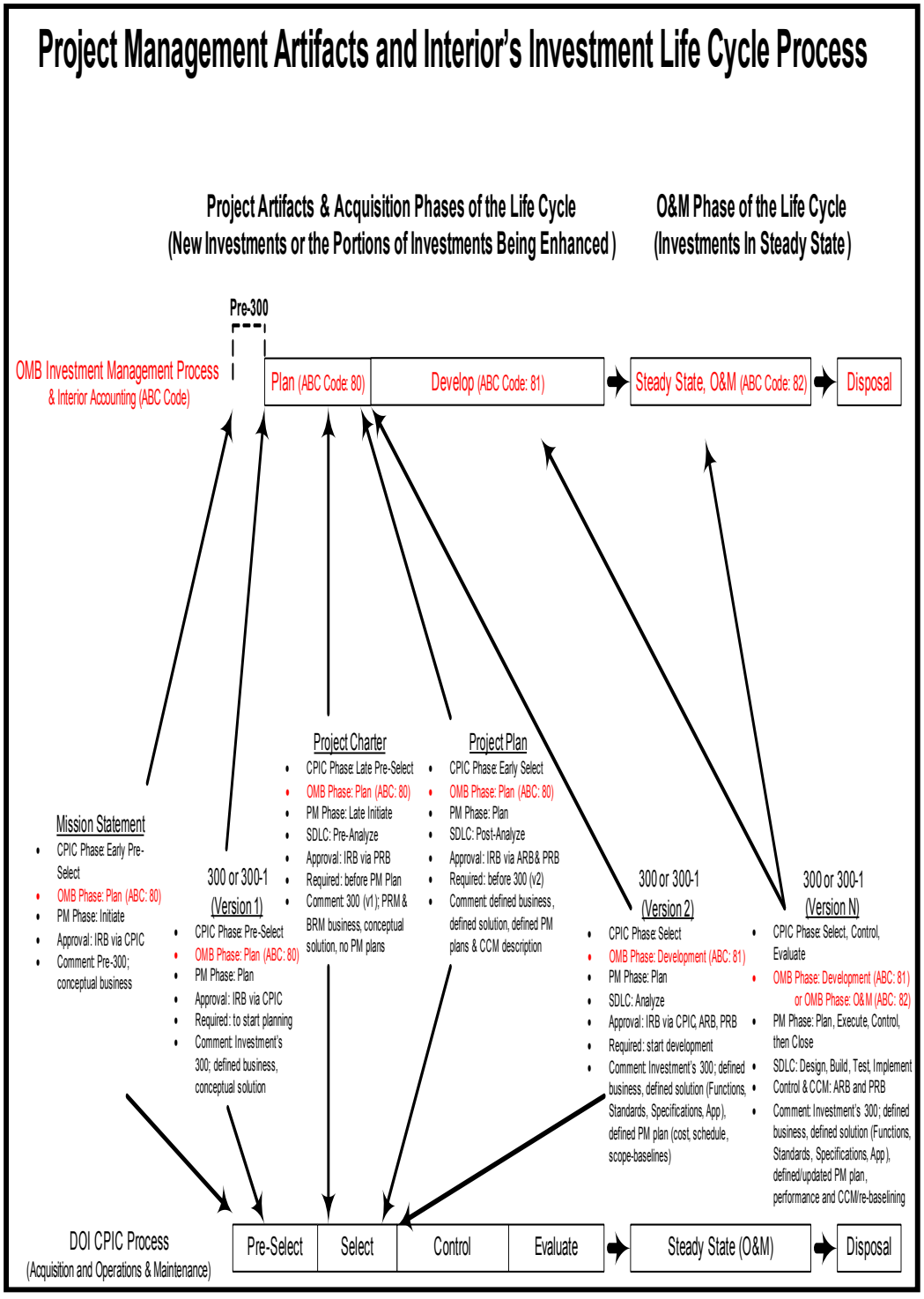


Diagram G. 1 Project Management & CPIC

G.2 Components

Management (program sponsors and project managers) should complete the following project management components to help ensure the investment's successful completion:

Project Charter—Project charter is a critical element of every successful investment. It provides a foundation on which to base anticipated efforts. The project charter is developed by senior management (sponsor) and accepted by the Investment Review Board. The charter formally authorizes the existence of the project. It provides the project manager with the authority to apply organizational resources to project activities. Project Chartering includes:

- This event and document should follow PMBOK guidance.
- The chartering process should be defined part of the CPIC/PM process sequence, (see diagram G. 1 in the previous section.)
- The project charter is the responsibility of the business sponsor.
- The chartering process should be under the IRB's authority and an IRB responsibility before the project starts or is authorized to expend resources.
- The definition of a Project Charter can be found in Appendix O: Glossary of Terms and Acronyms.
- The project charter should be an acceptance prerequisite to the project planning document.

Project Plan:

This event and document should follow PMBOK Guidance and should include the nine project management areas sub-plans that include their respective execution controls and change control management (CCM) procedures. (Please see: *DOI's Change and Configuration Management* process document, for a detailed description.) The nine sub-plans include:

1. **Integration Management Plan**, including integrated change control
2. **Scope Management Plan**, including the scope definition
3. **Time Management Plan**, including the project schedule baseline
4. **Cost Management Plan**, including the cost baseline
5. **Quality Management Plan**, including the quality monitoring and control

6. **Human Resource Management Plan**, including responsibility matrix
7. **Communication Management Plan**, including performance reporting
8. **Risk Management Plan**, including the risk adjusted plan
9. **Procurement Management Plan**, including solicitation, selection and contract administration

(Guidance for these plans can be found in the PMBOK. A copy of this can be found on this web-site: U. S. Department of the Interior - OCIO - IT Capital Planning)

- The planning process should be a defined part of the CPIC/PM process sequence, (see diagram G.1 in previous section)
- The project plan's development is the responsibility of the project manager
- The project plans acceptance should be under the Bureau or DOI IRB's authority and a Bureau or DOI IRB responsibility as appropriate.
- The project plan's review of adherence to standards should be by the project review process, organized and supported by the OCIO.
- The project plan should be an acceptance prerequisite to the OMB's developmental phase start (see diagram G.1 in previous section)
- Project plan changes and re-baselining should conform to Interior's CCM policies and guidance.
- Project plan changes and re-baselining should result in changes (updates) to the 300 or 300-1 (version N) (see diagram G.1 in previous section.)

Work Breakdown Structure (WBS)

Investments typically involve multiple components that may be complex or interface with other proposed or existing systems or data. Integrating these components is very challenging. To support improved integration and management, it is useful to develop a Work Breakdown Structure (WBS). A WBS provides a management framework by separating the investment lifecycle into distinct, manageable components related to various phases or stages of activities and interfaces. Each component is defined with appropriate sub-components and activities, such that one individual or team can implement each component. This enables the Project Manager to more effectively estimate the cost and schedule for completing individual components, supports sequencing activities and identification of interdependencies, and provides a basis to identify milestones and develop resource and schedule estimates.

Table G-1—WBS Example

Plan Project	
100	Define Project
10	Determine Project Objectives
20	Define Project Scope
30	List Project Products
40	Determine Project Constraints
50	Select Project Approach
60	Determine Project Standards
70	Assess Project Risks
200	Make Project Plan
10	Define Work Breakdown Structure
20	Determine Activity Dependencies
30	Define Project Milestones
40	Determine Project Organization
50	Estimate Effort
60	Allocate Resources
70	Schedule Activities
80	Develop Budget
90	Assess Project Risks
300	Obtain Project Approval
10	Assemble Project Plan
20	Present Project Plan
30	Agree to Project Plan

Table G-1 *Example of a Project Planning WBS Activities during the Select Phase*

Scope Management—The scope frames what is expected of the investment's ultimate capability and functionality, it directly impacts functional and system requirements development. The Project Manager should obtain the Project Sponsor's concurrence on the investment's scope, and then effectively manage that scope and mitigate scope creep. This can be accomplished by maintaining requirements traceability throughout the project lifecycle and implementing configuration management procedures. It is important for the Project Sponsor to determine whether existing requirements have been redefined, new requirements have been identified, or existing requirements eliminated based upon events.

The project scope should be based on the business requirements identified during the Pre-Select Phase and traced throughout the project lifecycle. All

system features, functions, and capabilities should be linked to original customer requirements throughout the entire planning, acquisition, design and implementation phases to ensure accurate system or network design.

Risk—Risk is inherent in every investment. To aid in effectively identifying, analyzing, developing responses, and managing risk, Project Managers should develop a risk management plan early in the planning stages, ideally during the Select Phase. Project Managers should employ subject matter experts (SMEs) among the various functional areas of the investment to identify risk and provide mitigation strategy. Key risk areas may include technology, cost, schedule, and performance or quality. The risk management plan is continually updated throughout the investment's lifecycle and is part of periodic reviews. Appendix E: Risk Management provides additional guidance on risk assessment and management.).

Cost and Schedule Management—Effective investment management entails establishing cost and schedule baselines. Actual information is collected, analyzed, and compared to original projections and the current baseline. Variances are identified, and appropriate actions are taken to inform senior management and mitigate the impacts of increased costs and schedule slippages. The WBS, milestones, activities, and project plan assist the development and tracking of cost and schedule. Earned value techniques provide a means to more completely evaluate costs and schedule, and assist in early risk identification (see Appendix H: Earned Value Analysis).

Performance—An investment's ultimate objective is to meet or exceed stakeholder performance expectations by ensuring the investment satisfies the mission need and business requirements. In the Pre-Select and Select Phases, performance planning includes defining performance measures and identifying activities required to ensure performance objectives will be met (see Appendix F: Performance Measurement). This may include benchmarking to establish a baseline and to further refine the investment's performance objectives. The Control Phase includes a continual monitoring of the performance baseline to potentially include quality reviews, tests, or pilot tests. In the Evaluate Phase, a PIR helps compare actual investment performance with expectations (see Appendix I: Post-Implementation Reviews). During the Steady State Phase, performance measures are analyzed to determine whether investments are continuing to meet mission needs and performance expectations.

Organizational Management—Organizational management skills needed to manage an investment include project staffing, communications, and organizational understanding. Project Managers should be able to identify the needed skill sets and assign appropriate personnel to accomplish a given set of activities. Project Managers should also have the requisite interpersonal and leadership skills to communicate with the project team, Project Sponsor, and stakeholders. This includes possessing a vision for the investment and how to best meet stakeholder expectations, as well as

ensuring the project team is able to focus on assigned tasks or activities. Additionally, Project Managers should be able to communicate and build consensus with key stakeholders, since this ultimately impacts the investment's success or failure.

Appendix H: Earned Value Analysis

H.1 Purpose

Earned value analysis is a program management technique that uses an investment's past performance and work to evaluate and forecast the investment's future performance. This enables the Project Manager to make changes that keep the investment at or bring the investment closer to planned expectations.

Earned value analysis is part of a performance based management system required by OMB for all IT investments. Earned Value analysis is built into the Exhibit 300 business case template. The Project Manager plans work breakdown structure (WBS) tasks and builds budget estimates for each task in the project plan. As the plan is executed, the Project Manager tracks actual progress and expenditures at the completion of each WBS against planned figures to obtain cost and schedule variances. These variances can then be used to identify schedule and cost-over or under-runs so they can be resolved as quickly as possible.

The earned value methodology requires an investment to be fully defined at the outset. The information that is required to complete an earned value analysis includes:

- List of all WBS tasks and critical milestones
- Planned cost of each WBS task
- Planned WBS start and completion dates
- Total budget for the investment
- Any project reserve.
- As the project plan is executed, the Project Manager tracks:
- Work (WBS tasks) completed
- Value of the completed work
- The actual cost of the work performed.

Earned Value analysis is based on the budgeted cost of work performed (BCWP), the budgeted cost work scheduled (BCWS) and the actual cost of work performed (ACWP). These three parameters provide the Project Manager, Project Sponsor, and other with all the input data required to assess project cost and schedule performance.

The approach can provide accurate and reliable assessments from as early as 15 percent into the investment's lifecycle. It provides early indications of cost and schedule variances, which help project managers, take appropriate risk mitigation steps. Typically, investments that are over-budget, cost variance

percentage, when 15 percent of the investment is finished will result in cost overruns. Once a cost overrun is identified, it can generally be reduced by only 10 percent, which indicates the need to support early awareness of potential cost and schedule risks. Early investment assessment and identification of cost and schedule variances is critical for the overall success of the investment, and supports improved cost and schedule control.

When calculating Earned Value, the following perspective should be considered:

- Government Activities
- Second and Third Party Agreements; contacts, inter-organization agreements.

Components of Government expenditures include:

- Labor (like staff time)
- Equipment
- Materials
- Facilities (like office space)
- Activities (like travel)

Second and Third Party agreements are based on (contract) terms including:

- A "firm-fixed" contract, tracking specified deliverables expenditures by planned verse actual delivery schedules (dates).
- A "time and materials" contract, tracking expenditures (as with the government):
    - Labor
    - Equipment
    - Materials
    - Facilities
    - Activities

H.2 Process

Before completing earned value analysis, the Project Manager needs to complete the following project management tasks (see

- Define investment activities
- Develop a project plan for the activities
- Develop a WBS for each activity

- Allocate costs to each WBS element
- Schedule each activity
- Chart and evaluate the investment's status.

The Project Manager will then have the basis for periodically assessing the investment's performance and completing the following four steps in the earned value analysis process:

1. Update the Schedule

The scheduled activities are reported as started, completed, or with a remaining duration as appropriate. For unfinished activities, the percent complete is reported. For work that results in discrete or concrete deliverable products (e.g., reports, studies, briefings, etc.), it generally is easy to determine the percent complete. For efforts that are not so easily measured, special "earning rules" may be employed. A common "earning rule" is to report percent complete according to completed milestones within an activity.

2. Record Actual Costs

After updating the schedule, actual costs from the investment's or organization's accounting system are recorded. In situations where the accounting system does not provide the level of detail required to obtain actual accounting costs, the Project Manager may need to estimate what percentage of actual costs should be assigned to the investment, but this should only be done when actual costs are not readily available.

3. Calculate Earned Value Measures

After recording actual costs for the reporting period, earned value measures are calculated and reports generated. This can be done, in part, by creating an earned value chart as shown below.

Figure H-1—Sample Earned Value Analysis Chart (This can be accomplished using a standard project management or spreadsheet software's charting functionality.)

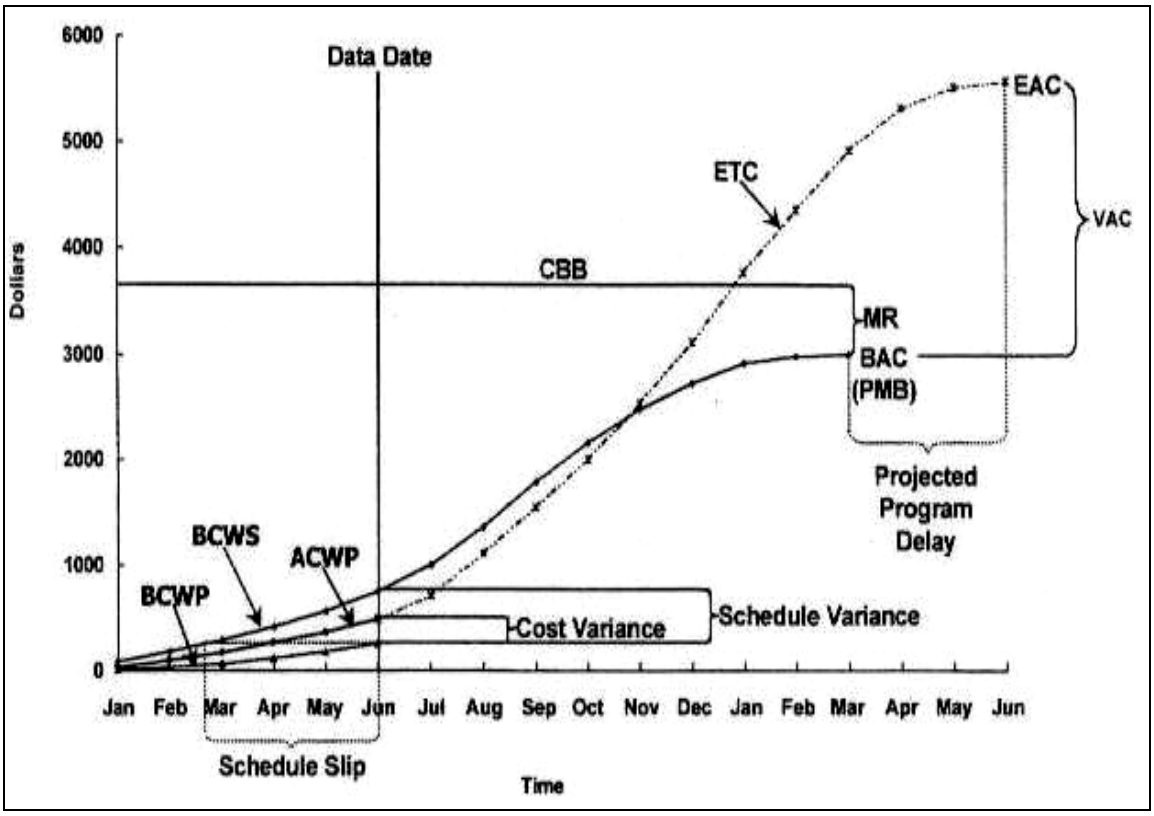


Figure H-1. *Sample Earned Value Analysis Chart*

The sample chart includes the following earned value measures:

Actual Cost of Work Performed (ACWP)—The sum of costs actually incurred and recorded in accomplishing the work performed through the data date.

Budget at Completion (BAC)—The sum of all planned budgets established for the investment.

Budgeted Cost for Work Performed (BCWP)—The sum of the budgets for completed work packages and completed portions of open work packages, plus the applicable portion, usually a percentage, of the budgets for level of

effort and apportioned effort as of the data date, this is also called the "earned value."

Budgeted Cost of Work Scheduled (BCWS)—The sum of all WBS element budgets that were planned or scheduled for completion as of the data date.

Contract Budget Base (CBB)—The total cost of all budgeted activities necessary to complete a task.

Cost Performance Index (CPI)—Earned value divided by the actual cost (BCWP divided by ACWP).

Cost Variance (CV)—Earned value minus the actual cost of work performed (BCWP minus ACWP).

Cost Variance Percentage (CV percentage)—Cost variance divided by earned value (CV divided by BCWP).

Estimate at Completion (EAC)—The actual costs incurred, plus the estimated costs for completing the remaining work (BAC divided by CPI).

Estimate to Complete (ETC)—The budget necessary to complete all tasks from the ACWP end date through the investment's conclusion (EAC minus ACWP).

Management Reserve (MR)—The amount of the total allocated budget withheld for management control purposes rather than designated for the accomplishment of a specific task or set of tasks; not part of the performance measurement.

Performance Measurement Baseline (PMB)—The time-phased budget plan against which investment performance is measured.

Schedule Performance Index (SPI)—Earned value divided by the planned budget for the completed work (BCWP divided by BCWS).

Schedule Variance (SV)—Earned value minus the planned budget for the completed work (BCWP minus BCWS).

Schedule Variance Percentage (SV percentage)—Scheduled variance divided by the planned budget for the completed work (CV divided by BCWS).

Variance at Completion (VAC)—The difference between the total budget assigned to a contract, WBS element, organizational entity, or cost account and the estimate at completion; represents the amount of expected overrun or under run.

4. Analyze the Data and Report Results

The critical path milestones used to complete the earned value analysis are directly derived from the project plan. These are the milestones that require completion before a successive milestone can begin. The data is collected and monitored for each milestone throughout the project to achieve maximum effectiveness.

Appendix I: Post-Implementation Reviews

I.1 Purpose

Post-Implementation Reviews (PIRs) support the Evaluation Phase of the process (see **Chapter 5—Evaluate Phase**). PIRs help determine whether investments have achieved expected benefits, such as lowered cost, reduced cycle time, increased quality, or increased speed of service delivery.

The PIR has a dual focus:

It provides an assessment of the implemented investment, including an evaluation of the development process.

It indicates the extent to which the DOI's decision-making processes are sustaining or improving the success rate of IT investments.

The PIR usually occurs either after a system has been in operation for about six months or immediately following investment termination.

In order to ensure independent validation and verification, a team should conduct the PIR. The team should not include members from the investment under review. The PIR team should review the following investment elements:

- Mission alignment
- IT architecture including security and internal controls
- Performance measures
- Project management
- Customer acceptance
- Business process support
- Cost versus anticipated savings.

As a minimum, the PIR team will evaluate stakeholder and customer or user satisfaction with the end product, mission or program impact, and technical capability, as well as provide decision-makers with lessons learned so they can improve investment decision-making processes.

The review will provide a baseline to decide whether to continue the system without adjustment, to modify the system to improve performance or, if necessary, to consider alternatives to the implemented system. Even with the best system development process, it is quite possible that a new system will have problems or even major flaws that must be rectified to obtain full investment benefits. The PIR should provide decision-makers with useful information on how best to modify a system, or to work around the flaws in

a system, to improve performance and bring the system further in alignment with the identified business needs.

I.2 Process

There are seven major steps to conducting a PIR:

1. Initiate PIR

CIO and the investment sponsor select the PIR review team. The review team initiates a PIR by preparing and sending a memorandum to the Project Manager stating the review has begun. The memorandum should include a schedule for the planned review and indicate any areas that may receive special review emphasis.

2. Analyze Documentation

The review team reviews existing investment documentation and analyzes the information to understand the investment scope, generate interview and survey questions, prepare for system overview briefings, and plan the PIR. The review team also reviews any existing reports and memoranda from the Pre-Select, Select, and Control Phases to uncover any findings or outstanding issues.

3. Interview Key Players

The review team interviews all key IT and business process players. The interviews should help the team develop an understanding of the system's goals, objectives, benefits, and costs as described in the Exhibit 300 or 300-1 business case submitted during the Select Phase. Additionally, the interviews will help the team determine how efficiently and effectively the system's objectives, goals, performance measures, and benefits are being achieved, as well as identify system deficiencies and enhancement needs.

4. Measure Performance

The review team assesses the investment performance measures established during the Select Phase. These performance measures are compared to actual data generated during the operations and or production stage. In the absence of certain statistics, the review team may perform onsite observations to measure specific criteria.

5. Perform User Surveys

The review team conducts qualitative surveys with users to determine user satisfaction with the system. Executing the survey may include designing questionnaires, distributing survey questionnaires to remote users' locations, receiving responses, analyzing results, and generating a survey results memorandum. The survey measures the system's efficiency and effectiveness in achieving its stated goals and benefits and in satisfying user needs.

If users are external to DOI we need approval from OMB prior to sending them a questionnaire.

6. Perform Analysis

The review team analyzes all documentation, survey results, and performance measurements to determine if the system efficiently and effectively achieved its objectives.

7. Findings and Recommendation Report

After comments are received from the Project Sponsor, the review team prepares the Final Report and submits it for the Bureau CIO, EWG, and Bureau IRB review. Report findings and recommendations must be clear and concise to avoid any misunderstandings.

8. Final Decision

The CIO, project manager and Department sponsor determine the appropriate course of action to resolve any outstanding issues. Decisions will also be made whether to continue the system without adjustment, modify, or terminate, based on the PIR recommendations.

I. 3 Sample Initiative Evaluation Sheet

SAMPLE INITIATIVE EVALUATION SHEET				
General information				
Title:				
Description:				
Project Sponsor:				
UPI:				
PIR Conducted By:				
Date of PIR:				
Performance Measures				
Item	Baseline	Actual	Variance	Comments
Quantitative				
Financial				
Non-Financial				
Baseline Status				
Item	Baseline	Actual	Variance	Comments
Lifecycle Cost				
Lifecycle Return				
Schedule				
Enterprise Architectural Analysis				
Enterprise Architectural Assessment				
IT Accessibility Analysis				
IT Accessibility Assessment				

Telecommunications Analysis
Telecommunications Assessment
Risk Analysis
Risk Management
Security Analysis
System security risk management or mitigation review. Additional mitigation strategies and counter measures (if needed).
Stakeholder Assessment
General Comments
Lessons Learned
Project Management Assessment
Technical Assessment

Table I-1 IT Initiative Evaluation Data Sheet

I.4 Investment Management Report

INVESTMENT MANAGEMENT REPORT
Name of Investment:
Project Sponsor:
Date of PIR:
Background (Description of Project)
Management Approach
Organizational Structure
Resources
Acquisition Strategy
Contracting Strategy
Security Strategy
Documentation
Technical Approach
Architecture (description, adherence to ISTA, and IT accessibility requirements, security, telecommunications, and architecture standards)
Development (if applicable)
Testing
Lessons Learned
List of lessons learned
Recommended best practices

Table I-2 IT Investment Management Report Data Sheet

I.5 IT Initiative Evaluation Data Sheet

	Initiative Development	Screen	Score	Pre-Select	Select	Control	Evaluate	Steady State
Was each phase conducted at the appropriate time in the process?								
Was the data content sufficient to move forward to the next phase in the process?								
Were there enough resources (e.g., people) allocated for each phase in the process?								
Were the right types of people and expertise involved?								
Was there an acceptable level of information flow?								
Was eCPIC able to support the activity in each phase in the process?								
List suggested corrective actions for any phase in the process.								
Comments:								

Table O-3 *IT Initiative Evaluation Data Sheet*

Appendix J: IT Investment Rating and Ranking Criteria

J.1 Purpose

To define the criteria that will be used to rate and rank the IT investments being presented to the IT Investment Review Board and other executive management committees.

J.2 Background

Ongoing Departmental IT portfolio management activities require development of rating and ranking criteria to compare IT investments in support of investment management decisions. Competition for resources may only allow a portion of the proposed investments to be approved and funded. In addition, a structured investment decision making process is required by OMB. The proposed criteria will produce one standard view for comparing major IT investments across the Department. The Investment Review Board requested that the previous rating criteria be revised to reflect value, risk, health of the project, and quality of the business case. The table below describes the source for each of criteria. Each of these categories contains a structured set of criteria; for example, the quality category reflects the OMB business case scoring criteria.

Category	Source of Rating Criteria
Value Measures the value of the investment to the Department or Bureau.	These criteria are defined further below in this appendix.
Risk Measures high-level risks associated with the investment.	
Quality Measures the current quality of the business case.	Based on the OMB scoring criteria contained in circular A-11. Scores will reflect the most current version of the business case (Exhibit 300) for each of the major investments.
Health of the Project Measures the current status of the major investments for projects that are spending money for Development, Modernization, and Enhancement.	Cost, schedule, and performance variances will be derived from the latest quarterly or monthly reports.

J.3 Value Criteria

Decision Criteria	Scoring	Weight
Value Factors	**Weights for Risks ∑=100%**	
V-1: Business Impact or Mission Effectiveness How well does the investment contribute toward meeting DOI or Bureau objectives in terns of effectiveness?	6 – Very high value or effectiveness; directly supports multiple objectives, and supports multiple agencies or Departments. 5 – High value or effectiveness; significantly supports at least one objective, potential for use in more than one Interior Bureau. 4 – Medium value or effectiveness; moderately supports multiple objectives at one Bureau. 3 – Low value or effectiveness; supports one objective at one Bureau. 2 – Neutral – does not support or conflict. 1 – Extremely low value; conflicts with or counters objectives.	20%
V-2: Customer Needs How well does the investment address identified internal and or external customer needs?	6 – Very high value; supported or needed by many customers and provides critical or mandatory capabilities and benefits to citizens. 5 – High value supported or needed by many customers and provides substantial benefits. 4 – Medium value supported or needed by a moderate number of customers and provides only moderate benefits. 3 – Low value supported or needed by a limited number of customers and provides limited benefits. 2 – Very low value supported or needed by only a few people and provides insignificant benefits. 1 – Extremely low value supported or needed by one person and provides no increased benefits.	20%
V-3: Financial Analysis Is the benefit-cost analysis reliable and technically sound? Are assumptions valid and realistic?	6 – Well done ROI analysis completed, with positive ROI achieved within 1 year after system implementation, or the investment is in Steady State and it is currently delivering a positive ROI. 5 – Well done ROI analysis completed, with positive ROI achieved within 2 year after system implementation, or the investment is in Steady State and it is currently delivering a positive ROI. 4 – Well done ROI analysis completed, with positive ROI within 3-4 years after system implementation. 3 – Well done ROI analysis completed, with positive ROI within more than 5 years after system implementation. 2 – Unclear ROI analysis, or an ROI analysis done that shows a positive ROI achieved more than 9 years after system implementation. 1 – No ROI analysis completed, or the analysis done identifies a negative ROI.	20%
V-4: Expected Improvement What is the expected magnitude of the performance improvement or productivity achieved from the investment?	6 – The investment completely reengineers internal processes and greatly enhances a user's ability to perform their tasks (e.g., productivity increase of 75% or greater). 5 – The investment greatly enhances its users ability to complete their jobs (e.g., productivity increase of 50-75% or greater). 4 – The investment provides significant improvements in operational efficiency (e.g., productivity increase of 25-50%). 3 – The investment provides some improvement in user's operational efficiency (e.g., productivity increase of 10-25%). 2 – The investment enables users to accomplish their job, and does not either enhance or hinder the users in that work (e.g., no increase in productivity). 1 – The investment hinders its users from accomplishing their job.	20%

Decision Criteria	Scoring	Weight
V-5: Architecture	The criteria encompassed herein will be used to assess alignment of DOI's information technology (IT) investments with all layers of the Interior Enterprise Architecture (IEA). Investments will be evaluated to ascertain the following: • Strategic Alignment with DOI goals and objectives via the Performance Reference Model (PRM). • Absence of duplicative functionality with other target systems/investments via the Business Reference Model (BRM). • Absence of redundant data with other target systems/investments via the Data Reference Model (DRM). • Extent to which component based architecture and re-use/sharing of service components is realized via the Service Reference Model (SRM). • Adherence to the technologies approved by DOI as identified in the current DOI Technical Reference Model (TRM). *see J.2 EA Rating Criteria below.	20%
Sum of Value Factors		100%

J.4 IEA Rating Criteria:

The DOI Enterprise Architecture Repository (DEAR), which contains DOI systems and investments, should be used by project managers in conjunction with their bureau chief architects, as a key source of information to review an investment relative to other DOI investments and legacy systems. For example, a project manager can view any other systems and investments that are mapped to like functions in the DOI BRM in order to evaluate whether the investment may duplicate existing functionality with other systems. This information should be considered a starting point for further questions such as: Does the investment perform aspects of the function in question that other DOI systems/investments do not perform? If so the investment may not be duplicative, but the BRM should be decomposed further to show this distinction in functionality. This feedback should be provided to the bureau chief architect and the DOI Chief Architect for expanding the DOI BRM. Other questions that may be researched are: Will this investment produce service components that can be re-used/shared by other systems? Are there service components from other systems that can be leveraged by this investment?

Strategy NOTE: Key Objectives

a) Influence the movement towards strategic investments that are horizontal in nature including not only the shared mission capabilities between bureaus but also the common infrastructure services and common application services.
b) Eliminate duplicative planned investments with other target solutions.
c) Drive due diligence in the research of artifacts (affected as-is state and future) to preclude redundant and duplicative investments and functionality in target solutions. Note: The DOI Enterprise Architecture Repository (DEAR) should be mined to evaluate an investments relationship with other legacy systems and proposed investments. Contact your bureau's chief architect to coordinate.

d) Influence sound architectural planning to ensure legacy systems are properly addressed in the target investment's migration and transition plans.
e) Develop way to prioritize business cases in a relative or comparative architecture index.
f) Ensure adherence to the approved modernization blueprints.

1. **Performance Reference Model:** The Investment must demonstrate quantified or measurable improvements in the associated intermediate or end outcomes as defined in the DOI Strategic Plan and its supporting performance targets and measures, and OMB Performance Model.

High – 5 points.

- Investment links to the OMB PRM and quantitatively (1%-X%) improves the achievement of specific outcomes, end and intermediate, in the DOI Strategic Plan.
- The investment addresses the performance measures that have cross-cutting Departmental (i.e., all bureaus) benefit(s).
- Investment identifies specific supporting program/project level measures and targets in the context of the PRM.

Medium – 3 points

- Investment links to the OMB PRM and quantitatively (1%-X%) improves the achievement of specific outcomes, end and intermediate, in the DOI Strategic Plan.
- The investment addresses the performance measures that have multi-bureau benefit(s) (i.e., benefits more than one but not all DOI bureaus).
- Investment identifies specific supporting program/project level measures and targets in the context of the PRM.

Low – 1 point

- Investment provides minimal support for achieving Strategic Outcomes in the DOI Strategic Plan, OMB PRM linkage is unclear or questionable and program/project goals are unclear.
- The investment addresses the performance improvement of a single bureau or program
- Investment links to the OMB PRM and qualitatively improves the achievement of specific outcomes, end and intermediate, in the DOI Strategic Plan.
- Investment identifies specific supporting program/project level measures and targets in the context of the PRM.

2. **Business Reference Model** - Investment clearly supports key mission or supporting administrative functions necessary for the successful implementation of the DOI mission.

High – 5 points

- Investment has demonstrated in its business case the actual or planned value (quantitative performance measures) of a **re-engineered** business process(es) that benefits multiple DOI agencies.

- Investment has identified and mapped the relevant business models (business processes, functions, rules and/or procedures) and integrated them into their business concept and solution strategy.
- Investment does not duplicate functionality with other target systems/investments. The DOI EA Repository (DEAR) should be reviewed in concert with the bureau chief architect to determine potential duplication of existing systems/investments and functionality.
- Investment adequately addresses migration and transition plans (e.g., data, functional, funding, workforce planning, etc.) for all legacy systems that will be retired/integrated as a result of the target investment.

Medium - 3 points

- Investment has identified the need for business process re-engineering but has not provided adequate planning evidence in preparation for it.
- Investment has identified and mapped the relevant business models (business processes, functions, rules, and/or procedures) and integrated them into their business concept and solution strategy.
- Investment does not duplicate functionality with other target systems and investments. The DOI EA Repository should be reviewed in concert with the bureau chief architect to determine potential duplication of existing systems/investments/and functionality.
- Investment identifies specific targets for completing migration and transition plans (e.g., data, functional, funding, workforce planning, etc.) for all legacy systems that will be retired/integrated as a result of the target investment.

Low – 1 point

- There is no demonstrable evidence of business process re-engineering.
- Investment does not reference any intent to optimize the existing business models (business processes, functions, rules and/or procedures) available throughout the DOI.
- Investments have **not** identified and mapped the relevant business models (business processes, rules, functions and/or procedures), and integrated them into their business concept and solution strategy.
- Investment duplicates functionality with other target systems/investments. The DOI EA Repository should be reviewed in concert with the bureau chief architect to determine potential duplication of existing systems/investments/and functionality.
- Investment does not adequately address or plan for the development and completion of migration and transition plans (e.g., data, functional, funding, workforce planning, etc.) for all legacy systems that will be retired/integrated as a result of the target investment.

3. **Data Reference Model** - Investment adheres to established DOI data reference model and associated data standards where applicable and does not "create" duplicate data associated with other IT investments/systems. Conforms to the data architecture recommendations in DOI modernization blueprints.

High – 5 points

- Investment adheres to applicable Federal and DOI data standards.
- Investment has identified and mapped the relevant data subject areas and information types to existing data repositories (implemented and design to) and integrated them into their business concept and solution strategy.
- Investment identifies the data subject areas and information types that it proposes to become the DOI-wide authoritative data source. Also identifies all duplicative data sources that currently exist and planned retirement/integration of these sources into the target solution's data migration/integration plans.
- Investment is engineered to optimize shared investments of data and information repositories available throughout the DOI.

Medium - 3 points

- Investment adheres to applicable Federal and DOI data standards.
- Investment has not identified and mapped the relevant existing data repositories and data standards, (implemented and design to) and integrated them into their business concept and solution strategy.
- Investment identifies the data subject areas and information types that it proposed to become the DOI-wide authoritative data source. Investment discusses the future development of data migration/integration plans to ensure that no duplicative data sources will exist after the target solution has been implemented.
- Investment is engineered with the intent to optimize shared investments of data and information repositories available throughout the DOI.

Low – 1 point

- Investment does not adhere to relevant Federal and DOI data standards.
- Investment has **not** identified and mapped the relevant existing data repositories and data standards, (implemented and design to) and integrated them into their business concept and solution strategy.
- Investment duplicates data with other legacy or target systems/investments and does not address plans for retirement/integration into a target solution.
- Investment has not engineered its business case with the intent to optimize the shared existing data repositories and data standards available throughout the DOI.

4. **Service Reference Model -** Investment embraces a service oriented, component-based architecture by providing or leveraging components for enterprise re-use/sharing.

High – 5 points

- Investment has engineered its business case to optimize the shared investments of system and applications services available throughout the DOI.
- Investments has identified and mapped the relevant existing service standards, (implemented and design to) and integrated them into their business concept and solution strategy.
- Investment recognizes the planning and risk management required to integrate with existing services and has developed the risk mitigation strategies (cost, schedule, technical, etc...)

Medium - 3 points

- Investment has engineered its business case to optimize the shared investments of system and applications services available throughout the DOI.
- Investments has not identified and mapped the relevant existing service standards, (implemented and design to) and integrated them into their business concept and solution strategy.
- Investment recognizes the planning and risk management required to integrate with existing services and has developed the risk mitigation strategies (cost, schedule, technical, etc...)

Low – 1 point

- Investment has not engineered its business case to optimize the shared investments of system and applications services available throughout the DOI.
- Investments have **not** identified and mapped the relevant existing service standards, (implemented and design to) and integrated them into their business concept and solution strategy.
- Investment does not recognize the planning and risk management required to integrate with existing services and has developed the risk mitigation strategies (cost, schedule, technical, etc...)

5. Technical Reference Model - Investment adheres to the best practices, principles and standards embodied in the current version of the DOI TRM.

High – 5 points

- Investment adheres to the technology standards, best practices and principles embodied in the current version of the DOI TRM.
- Investment has identified and mapped the relevant existing technology standards, (implemented and design to) and integrated them into their business concept and solution strategy.
- Investment recognizes the planning and risk management required to integrate with existing technology and standards and has developed the risk mitigation strategies (cost, schedule, technical, etc...)

Medium - 3 points

- Investment adheres to the technology standards, best practices and principles embodied in the current version of the DOI TRM.
- Investment has identified and mapped the relevant existing technology and standards, (implemented and design to) and integrated them into their business concept and solution strategy.
- Investment document does not adequately address the planning and risk management required to integrate with existing services and has developed the risk mitigation strategies (cost, schedule, technical, etc...)

Low – 1 point

- Investment does not adhere to the technology standards, best practices and principles embodied in the current version of the DOI TRM.
- Investment has **not** identified and mapped the relevant existing service standards, (implemented and design to) and integrated them into their business concept and solution strategy.
- Investment does **not** recognize the planning and risk management required to integrate with existing DOI technologies and standards and has failed to develop the risk mitigation strategies (cost, schedule, technical, etc...)

Overall Interior Enterprise Architecture Rating

Currently, all models are weighted equally. Therefore to calculate your overall score, add up your individual reference model scores and divide by five.

IEA Business Case Rating Criteria	Score
Performance Reference Model	
Business Reference Model	
Data Reference Model	
Service Reference Model	
Technical Reference Model	
Subtotal Score	
Total Overall (Subtota/5)	

J.5 Risk Factors

Decision Criteria	Scoring	Weight
Risk Factors	**Weights for Risks ∑=100%**	
R-1: Funding Risks – Ability to Secure Budgetary Resources How difficult will it be to obtain funding for this investment, given competing resources and priorities?	6 – Extremely Difficult - Congressional support is needed for funding this investment. 5 – Very Difficult - OMB or other Executive Branch support is needed for funding this investment. 4 – Difficult - DOI Secretary level support is needed for funding this investment. 3 – Not Difficult - Assistant Secretary level support is needed for funding this investment. 2 – Easy - Bureau Director or Head of Office level support is needed for funding this investment. 1 – Very Easy - Support for funding this investment is below the Bureau Director or Head of Office level.	25%
R-2: Project Implementation or Scheduling Risks Do projects adopt a modular approach that combines controlled systems development with rapid prototyping techniques? Are projects as narrow in scope and brief in duration as possible to reduce risk by identifying problems early and focusing on projected versus realized results? Schedule includes appropriate milestones and review points typical of system lifecycle phases.	6 – Extremely High Risk – The investment has no schedule 5 – High Risk - The investment has a schedule with unverifiable milestones or unrealistic timeframes 4 – Medium High Risk - The investment has a schedule for new development work with well defined activities and milestones with measurable completion, realistic timeframes but dependencies are not identified or evident. 3 – Medium Risk – The investment has a schedule for new development work with well defined activities and milestones with measurable completion, realistic timeframes, and well documented dependencies. 2 – Low Risk – The investment is already completed but future planning is not evident. 1 – No Risk – The investment is already completed and future planning for enhancements or upgrades is evident.	25%
R-3: Technical Risks How will proposed investments be integrated into existing ones? Will proposed investment take advantage of Commercially Available and Non-Developmental Items? How will the complexity of the investment's design affect the development of the project?	6 – Very significant infrastructure changes and additional support required, changes affect many infrastructure components, all technology used in the system or investment is untried or not approved for use within the Department or Bureau; custom developed application. 5 – Moderate to high infrastructure changes or additional support required. Changes affect several infrastructure components. Several untried or unapproved technologies are used in the investment. COTS not utilized. Custom developed application 4 – Moderate infrastructure changes or additional support required, several untried or unapproved technologies are used in the investment. COTS utilized with formal customization (associated programs). 3 - Some minor infrastructure changes or additional support required, very limited or no use of untried or unapproved technologies. 2 - No impact to infrastructure, technology already available at DOI but some investment is required to procure additional licenses, hardware, etc 1 - No impact to infrastructure uses technology already available at DOI. All technologies used in the investment follow Department and Bureau standards, or the investment needs no technologies. COTS utilized with no modification and easily customized via user interfaces.	25%

Decision Criteria	Scoring	Weight
R-4: Organizational Risks How is the investment being accepted by the user community? How many organizations are being affected by the implementation of this investment?	6 – The implementation of the investment is extremely complex, requires major cultural change, and will require all users to radically change the way they do business. Investment affects all or nearly all of the DOI organization. 5 – The implementation of the investment is moderately to highly complex, requires significant cultural change, and requires users to significantly change the way they operate. Investment affects a larger number of users and or multiple Bureaus, offices or programs. 4 – The implementation of the investment is moderately complex, requires moderate cultural change, and will require modest changes in the way users do business. Implementation impacts a moderate number of users and or organizations. 3 - The implementation of the investment is simple, fits Department or Bureau culture, and will require only minimal accommodation by the users. Implementation impacts a low number of users and or organizations. 2 – The implementation of the investment is in progress, all cultural issues are being addressed, and the users are accepting the investment. Implementation impacts a very small number of users and or DOI organizations. 1 – The implementation of the investment has been accomplished, all cultural issues have been addressed, and the users have accepted the investment	25%
Sum of Overall Risk Factors		100%

Appendix K: Security Infrastructure Guide

K.1 Overview

The Chief Information Officer (CIO) of the Department is responsible for providing policy, guidance, advice and oversight for IT security. The CIO is supported by the Departmental IT Security Manager (DITSM). (further information may be found at www.doi.gov/ocio/security)

The senior official for IT systems (or Information Resources) management at each Bureau is responsible for the security and protection of Bureau IT systems. Each Bureau shall appoint a Bureau IT Security Manager (BITSM) and an alternate to serve as the focal point for IT security matters and to coordinate IT security program requirements with the Department. In addition, each IT installation shall appoint an Installation IT Security Officer to ensure that users know and understand the security responsibilities for the IT resources they control.

Departmental policy requires managers and users, including contractors, at all levels to be responsible and accountable for protecting the information technology resources they utilize. Departmental policy also places emphasis on risk management, contingency planning, and awareness training.

Departmental policy requires the development of an IT security program that is consistent with, and an integral part of the Department's Enterprise Architecture. (EA)

K.1.1 Objectives

DOI will safeguard its IT systems through the implementation of the DOI IT Security Program, which will accomplish the following:

Establish a level of IT security for all unclassified IT systems and information commensurate with the sensitivity of the information and with the risk and magnitude of loss or harm resulting from improper operation or losses resulting from fraud, waste, abuse, disasters, or mismanagement.

Define, manage, and support the security planning process for all DOI systems.

Establish a program to formally certify and authorize processing of SBU data on all systems within DOI.

Define and manage the contingency planning process, including training and testing, to provide IT systems with adequate continuity of operations upon disruption of normal operations.

Understanding, by all levels of DOI, the critical role of IT security to achieve DOI's missions and be appropriately and periodically trained through IT security awareness and training program.

Define and manage the computer security incident response capability program for all DOI employees.

Use the procedures outlined in Federal Information Processing Standards (FIPS) and other Federal government guidance except where the costs of using such standards exceed the benefits or where use of the standards will impede DOI in accomplishing its mission.

K.1.2 Policies and Bulletins

Several documents establish and define the Department's policy for the security of its information technology resources. These include:

- Departmental Manual Chapter 375 DM 19, "Information Technology Security Program"
- Departmental Information Technology Security Plan (ITSP), April 2002
- Risk Assessment Guide
- Contingency Planning Guide
- System Security Plan for General Support Systems
- System Security Plan for Major Applications
- Asset Valuation Guideline

K.1.3 Interior IT Security Guidance & Team

The Department established the IT Security Team (ITST) in January 2002. The Team's mission is to ensure the successful implementation of the Office of Management and Budget (OMB) Circular A-130, Appendix III. The ITST is chaired by the DITSM with membership comprised of BITSMs and representatives from the Inspector General's office. The team works on issues relating to IT security such as policy, procedures and reporting to oversight agencies.

K.1.4 Training and Awareness

Awareness training plays an important role in achieving the Department's goal for computer security. Periodic computer security awareness training is provided to employees who are involved with the management, use, or operation of computer systems under its control. The training objectives are to enhance employee awareness of the threats to and vulnerability of computer systems; and to encourage the use of improved computer security practices within the Department.

K.1.5 Personnel

IT related supervisors, in conjunction with their respective personnel and security officers, review positions within the Department and assigned a sensitivity level based on the program supported and duties assigned. Personnel Officers arrange for background investigations for personnel assigned to sensitive positions.

Appendix L: eCPIC Requirements by Phase

The following is a checklist for eCPIC Investment and Portfolio Managers to use when entering information in eCPIC on their Bureaus' investments. This list is divided into the five phases of the Capital Planning and Investment Control (CPIC) process. For further instructions on using eCPIC, please refer to the *eCPIC Users' Guide, Version 2.0*

L.1 Pre-Select Phase

Create the new investment.

Create a contacts list for this investment.

Add the investment to your Department's Investment Portfolio.

Designate the investment as Major IT Investment, Non-major IT Investment, Non-major IT Investment that is a Sub-component of a Larger Asset, or Major IT Investment Multi-Agency Joint Effort.

Ensure that points of contact such as the Project Sponsor and or Functional Manager are kept updated within the General Information folder.

Complete the Select Screening Criteria checklist found in the Selection Screening information of the Selection Information section.

Use the established scoring weights and rules to assist in ranking this investment with others in the portfolio, using the scoring defined in Appendix J: Investment Rating and Ranking.

Complete Lifecycle Cost and Lifecycle Budget information located in the Financial Information folder.

Add supporting information to the Resource Library for the investment, such as preliminary budget estimates and spreadsheets and the Investment Review submission package.

Grant permissions to allow OCIO, EWG, IRB, and others to view the investment.

L.2 Select Phase

Update the Lifecycle Cost and Lifecycle Budget information located in the Financial Information folder as required.

Add any new or revised documentation that supports the initiative to the Resource Library. This includes documentation such as the Investment Review submission package, the Performance Measures Plan, Project Plan with schedule and costs, and Security and Telecommunications

information. It also includes the Business Case, Risk Profile, Technical Profile, and Management and Planning Profile information.

Complete the Performance Measures information.

Complete the Planned Cost and Schedule information.

Review and complete the Select Screening Criteria checklist found in the Selection Screening information of the Selection Information section.

Complete the Select Scoring Scorecard Information located in the Selection Scoring Information section of the Investment Manager.

Grant permissions as needed to enable editing, viewing, and scoring.

L.3 Control Phase

Update the Lifecycle Cost and Lifecycle Budget information located in the Financial Information folder as required.

Add any new or revised documentation that supports the initiative to the Resource Library, such as the Investment Review submission package.

Update the Performance Measures information.

Update the Planned Cost and Schedule information.

Complete the Control Screening Criteria checklist found in the Control Screening Information section.

Complete the Control Scoring Scorecard information located in the Control Scoring Information section of the Investment Manager.

Review initiative history and background information to support assignment of individual scores located in the General Information folder and in the initiative's Resource Library.

Ensure all folders from the Select Phase are completed and the Selection Status folder indicates the investment is approved and finalized so it can advance to the Control Phase.

Complete the Control Screening and Control Scoring data screens in the Control Information folder.

Complete the Control Cost and Schedule Information folder, including milestones to the 2nd level, associated costs, and variances.

Grant Permissions as needed to enable editing, viewing, and scoring.

L.4 Evaluate Phase

Update the Performance Measures information.

Update the Planned Cost and Schedule information.

Add any new or revised documentation that supports the initiative to the Resource Library, such as the Investment Review submission package. Include copies of the Post-Implementation Review and Independent Verification and Validation.

Grant permissions as needed to enable editing, viewing, and scoring.

L.5 Steady State Phase

Update the performance measures information.

Update the planned cost and schedule information.

Add any new or revised documentation that supports the initiative to the resource library, such as the investment review submission package.

Add any new or revised documentation that supports the initiative to the resource library, such as the investment review submission package. Include copies of the post-implementation review and independent verification and validation.

Grant permissions as needed to enable editing, viewing, and scoring.

Appendix M: Monthly and Quarterly Scorecards, and Corrective Actions Report (CAR)

M.1 Introduction

The *Monthly* and *Quarterly Scorecards* (**Figures P-1, P-2**) and *Corrective Actions Report* (**Figure P-5**) enable DOI to review, analyze, and report for DOI metrics on the progress of information technology (IT) investments, including programs, projects, and systems. They also enable DOI to document and execute corrective action when cost, schedule, risk, and benefit expectations are not being met – a critical IT investment management process.

All major investments, including those currently in development, modernization, and or enhancement (D/M/E); steady state; and mixed life cycle are to report quarterly. Project managers need to work within the project plan, in coordination with the program managers, to explain variances, viable remedial alternatives, remedial steps, schedules, and current status. This information should be reviewed with Bureau-level budget personnel and the CIO. Changes to funding levels, resulting from corrective actions and other events, shall be coordinated as directed by Departmental and Bureau financial procedures. Update quarterly reporting information and maintain the Exhibit 300 to include any proposed re-baselining agreed upon by the investment manager. These new baseline proposals will be reviewed by the CIO's office and the DOI's budget office for approval.

On a quarterly basis, Project Managers are required to complete the *Quarterly Scorecard* that provides project status on cost, schedule, benefits, and risks by assigning green, yellow, or red "stoplight" scores. If there are "yellow," or "red," variances, or the Category's status has changed since the previous quarter, projects are required to submit a Monthly Scorecard until variances are within the acceptable control range. In addition, monthly scorecards may be requested for high profile projects. Regardless of the reporting process, investment performance data, based upon earned value (EV) and or operational analysis, must be captured and maintained monthly to enable appropriate trending and annual reporting.

If there are "yellow," "red," or "blue" variances, or the Category's status has changed since the previous quarter, a *Corrective Actions Report(s)* must accompany the *Quarterly Scorecard*. The DOI Chief Information Officer (CIO) will submit these reports on all major DOI projects to the Investment Review Board (DOI IRB) and, as appropriate, to the Office of Management and Budget (OMB). They will also ensure that any planned or in-progress investments do not duplicate E-Government initiatives.

Each quarter, the reports are due as soon as possible but no later than 21 days after the end of the quarter.

Quarter	Period	Due Date
1st Quarter	October 1 – December 31	As soon as possible, but no later than twenty-one calendar days following the end of the Quarter.
2nd Quarter	January 1 – March 31	
3rd Quarter	April 1 – June 30	
4th Quarter	July 1 – September 30	

Should the reporting date fall on a non-workday, reports are due the next workday following the due date.

Monthly Scorecards are due as soon as possible but no later than 15 days after month's end.

M.2 Quarterly and Monthly Scorecards

Both the *Quarterly and Monthly Scorecards* must be completed using an Excel template (Excel Version 2000 or higher is needed). The latest templates can be downloaded from the DOI IT Capital Planning website at http://www.doi.gov/ocio/cp/. Quarterly and Monthly Scorecard examples (Figures P-1 and P-2) can be found on the following page.

CPIC Quarterly Report

Project Name:	Global Recreation Program	Lead Bureau:	BLM	
Unique Project ID:	010-00-01-22-00-1025-02-108-058	Date and Quarter:	1-Jan-05	Q2
Project Manager:	Bill D. Bridges	Telephone Number:	202 555-1212	
Project Status:	Mixed Life Cycle	eCPIC Revision #:	8	

Category	Metric	Qrtr	SS Value	D / M / E Value	Combined Value	Quarterly Trend	Quarterly Score
Cost	Cost Variance CV%	FY05 Q1	-4.9%		-4.9%		G
		FY05 Q2	8.8%		8.8%		
		FY05 Q3					
		FY05 Q4					
Schedule	Schedule Variance SV%	FY05 Q1	-12.6%		-12.6%		G
		FY05 Q2	9.6%		9.6%		
		FY05 Q3					
		FY05 Q4					
Estimate At Completion	Variance at Completion $_1$ VAC_1 %	FY05 Q1	-4.9%		-4.9%		G
		FY05 Q2	8.8%		8.8%		
		FY05 Q3					
		FY05 Q4					
	Variance at Completion $_2$ VAC_2 %	FY05 Q1	-11.4%		-11.4%		G
		FY05 Q2	8.4%		8.4%		
		FY05 Q3					
		FY05 Q4					

Total Score	B = > 10% G = > -6% Y = - 6% to - 9% R = < -9% or if one Category or more is Red	G

	Question	Y, N, or NA	If NO, what corrective action is being taken?	G Self Score G,R,NA
Collaboration (Interagency or Collaborative Projects)	Are partners providing required funding as planned? (Yes / No)	Y		G
	Are System Integration / Migration / Retirement Milestones being achieved as Planned? (Yes / No)	Y		G
	Are partners actively participating in decision-making activities? (Yes / No)	Y		G

Risk	For the 2 most relevant risks affecting current or upcoming project performance, please 1) describe the risk; 2) the consequence; and, 3) the mitigation plan or desired managerial action.		G
Description	Consequence	Mitigation Plan or Desired Managerial Action	Self Score G or R
Interoperability Risk - The system may not operate with other interfaces as designed.	Schedule and cost delay	Rescope Effort	G
			G

Project Manager Comments (Brief statement of project health and explanatory comments regarding project performance)

Review History (Signatures for files)

Avoiding Duplication of Agency Activities with the Presidential E-Government and Lines of Business Initiatives Certification

	Y or N
a. IT investment and acquisitions in excess of $2 Million have been examined by the appropriate reviewing official, and are deemed to be non-duplicative of E-Gov investments.	Y
b. IT investment and acquisitions in excess of $2 Million have been examined by the appropriate reviewing official, and are deemed to be duplicative of E-Gov investments.	
b1. If answer to previous question (b) is YES then has the investment been coordinated with the Deputy Assistant Secretary for Performance, Accountability and Human Resources.	

Project Manager _____ Name Date

Bureau E-Gov Rep _____ Name Date

Project Sponsor _____ Name Date

Bureau CIO _____ Name Date

Figure M-1: *Quarterly Report Template*

CPIC Monthly Report

Project Name:	**Global Recreation Program**	Lead Bureau:	**BLM**
Unique Project ID:	**010-00-01-22-00-1025-02-108-058**	Date and Reporting Month	**1-Jan-05** **September**
Project Manager:	**Bill D. Bridges**	Telephone Number:	**202 555-1212**
Project Status:	**Mixed Life Cycle**	eCPIC Revision #:	**8**

Category	Metric	SS Value	D / M / E Value	Combined Value		Score
Cost	**Cost Variance CV%**	8.8%		8.8%		**G**
Schedule	**Schedule Variance SV%**	9.6%		9.6%		**G**
Estimate At Completion	**Variance at Completion $_1$ VAC_1 %**	8.8%		8.8%		**G**
	Variance at Completion $_2$ VAC_2 %	8.4%		8.4%		**G**

Total Score	B = > 10% G = > -6% Y = - 6% to - 9% R = < -9% or if one Category or more is Red	**G**

	Question	Y, N, or NA	If NO, what corrective action is being taken?	**G** Self Score G,R,NA
Collaboration (Interagency or Collaborative Projects)	Are partners providing required funding as planned? (Yes / No)	**Y**		NA
	Are System Integration / Migration / Retirement Milestones being achieved as Planned? (Yes / No)	**Y**		NA
	Are partners actively participating in decision-making activities? (Yes / No)	**Y**		NA

Risk	**For the 2 most relevant risks affecting current or upcoming project performance,** please 1) describe the risk; 2) the consequence; and, 3) the mitigation plan or desired managerial action.		**G**
Description	**Consequence**	**Mitigation Plan or Desired Managerial Action**	Self Score G or R
Interoperability Risk - The system may not operate with other interfaces as designed.	Schedule and cost delay	Rescope Effort	G
			G

Project Manager Comments (Brief statement of project health and explanatory comments regarding project performance)

Review History (Signatures for files)

Avoiding Duplication of Agency Activities with the Presidential E-Government and Lines of Business Initiatives Certification

	Y or N
a. IT investment and acquisitions in excess of $2 Million have been examined by the appropriate reviewing official, and are deemed to be non-duplicative of E-Gov investments.	**Y**
b. IT investment and acquisitions in excess of $2 Million have been examined by the appropriate reviewing official, and are deemed to be duplicative of E-Gov investments.	
b1. If previous question (b) answer equals YES then has the investment been coordinated with the Deputy Assistant Secretary for Performance, Accountability and Human Resources.	

Project Manager _____ Name Date

Bureau E-Gov Rep _____ Name Date

Project Sponsor _____ Name Date

Bureau CIO _____ Name Date

Figure M-2: *Monthly Report Template*

The following describes the 6 categories within the *Scorecards* that the Project Manager must complete:

M.2.1 Input Administrative Data

Project Name – *input* name

Unique Project ID – *input* Unique Project Identifier used in Exhibit 300

Project Manager – *input* name

Project Status – *input* Planning, Acquisition, Steady State, or Mixed Life Cycle

Lead Bureau – *input* name

Date and Quarter – *input* the submission date and Fiscal Year Quarter (*Quarterly Scorecard*).

– *input* the submission date and month the Scorecard reflects (*Monthly Scorecard).*

Telephone Number – *input* 10 digit telephone number

eCPIC rev # – *input* the eCPIC revision number created for this reporting period

M.2.2 Reporting Earned Value Data

The project's EV data must be updated monthly in eCPIC. Once updated, an eCPIC revision must be created to preserve this "snapshot" data point. The updated eCPIC EV data can be the source for the *Quarterly or Monthly Report's* information. While projects are expected to use actual schedule and cost data to perform EV calculations, cost estimates may be used only in cases where unforeseen circumstances will not allow actual data to be obtained and processed in time for the reporting due date. (ANSI 748 permits estimated Actual Cost Work Performed (ACWP)). Actual cost estimation can be addressed as follows:

For DOI direct expenses (primarily labor), data can be extrapolated from the accounting system or time cards.

For contractor charges, obtain the estimated "actuals" (including open commitments) data directly from contractors. If not, estimate "actuals" (for a given time period) using the time-phased Estimate at Completion (EAC) data in eCPIC for your latest Exhibit 300.

IMPORTANT: If estimated "actuals" are used in a given reporting period, estimates must be reconciled to the actual cost incurred. This will have to be done by the next reporting period and, consequently, the measured categories' values must also be revised.

These Variances and Index can be calculated by entering source data in the EV Summary tab. The EV Summary tab will automatically populate the Reporting Template. A sample of the EV Summary tab is provided in **Figure P-2** below.

Metric	SS				D / M / E				Combined			
	FY04 Q4	FY05 Q1	FY05 Q2	FY05 Q3	FY04 Q4	FY05 Q1	FY05 Q2	FY05 Q3	FY04 Q4	FY05 Q1	FY05 Q2	FY05 Q3
Cost												
BCWP	2,192,400	2,192,400	-	-	-	-	-	-	2,192,400	2,192,400	-	-
ACWP	2,300,000	2,000,000	-	-	-	-	-	-	2,300,000	2,000,000	-	-
CV	-107,600	192,400	0	0	0	0	0	0	-107,600	192,400	0	0
CPI	0.95	1.10							0.95	1.10		
CV%	-5%	9%							-5%	9%		
Schedule												
BCWS	2,509,200	2,000,000	-	-	-	-	-	-	2,509,200	2,000,000	-	-
SV	-316,800	192,400	0	0	0	0	0	0	-316,800	192,400	0	0
SPI	0.87	1.10							0.87	1.10		
SV%	-13%	10%							-13%	10%		
To Complete												
BAC	3,838,100	2,100,000							3,838,100	2,100,000	-	-
EAC1	4,026,469	1,915,709							4,026,469	1,915,709		
EAC1	4,275,942	1,923,106							4,275,942	1,923,106		
VAC1	-188,369	184,291							-188,369	184,291		
VAC2	-437,842	176,894							-437,842	176,894		
VAC1 %	-5%	9%							-5%	9%		
VAC2 %	-11%	8%							-11%	8%		
TCPI	0.83	1.20							0.83	1.20		
CPI-TCPI	13%	-10%							13%	-10%		

Figure M-2: *EV Summary Tab (Quarterly Report)*

Alternatively, the Cost Variance, Schedule Variance, Variances at Completion, and "To Complete" Performance Index data may be entered directly into the Reporting Template tab. Planning, Acquisition, and Mixed Life Cycle data should be entered in the D/M/E column.

Metric		Definition	Formula
ACWP	Actual Cost for Work Performed	The sum of costs actually incurred and recorded in accomplishing the work performed through the data date.	
BAC	Budget At Completion	The sum of all planned budgets established for the investment. The OMB approved baseline.	
BCWP	Budgeted Cost for Work Performed	The sum of the budgets for completed work packages and completed portions of open work packages, plus the applicable portion, usually a percentage, of the budgets for level of effort and apportioned effort as of the data date. Also called the "earned value."	
BCWS	Budgeted Cost for Work Scheduled	The sum of all WBS element budgets that were planned or scheduled for completion as of the data date. Known also as "Planned Value."	
CPI	Cost Performance Index	The dollar value of work accomplished for each dollar spent. An efficiency measure.	BCWP / ACWP
CV	Cost Variance	Difference between the cost of work accomplished and what the baseline said that work should have cost.	BCWP - ACWP
EAC	Estimate At Completion	The projected final cost of work when completed. EAC may be calculated using either of the two formulas in the next column.	1. [ACWP +(1/CPI)] x (BAC- BCWP) 2. [ACWP +(1/CPI x SPI)] x (BAC- BCWP)

Metric		Definition	Formula
SPI	Schedule Performance Index	The dollar value of work accomplished for each dollar of work planned. An efficiency measure.	BCWP / BCWS
SV	Schedule Variance	The numerical difference between earned value less planned value.	BCWP - BCWS
TCEV	To Complete Efficiency Variance	The measure of a project's capability to complete its EAC. It is measured by comparing the CPI and To Complete Performance Index (TCPI) numbers. This measure relates the project's historic efficiency to the needed efficiency to complete the project with the remaining estimated budget.	((CPI – TCPI) / CPI) x 100
VAC	Variance At Completion	The difference between the baseline and actual budget at completion. Given the two different EAC calculations, there are two valid VAC calculations.	BAC-EAC

***Figure M-3**. Earned Value Summary*

M.2.2.1 Cost Category

This is the project's cumulative Cost Variance percentage (CV %), rounded to the nearest one percent. The CV% provides a snapshot of the project's Cost Variance history. If entering directly into the Quarterly Reporting Template tab, enter the CV% into the SS Value cell and or DME Value cell, and enter the total CV% into the Combined Value cell adjacent to the current Quarter. If using the Excel spreadsheet to calculate values, update the EV Summary tab (bolded cells with a border only) and the CV% cells will be calculated automatically. If using the Monthly Report, follow the same steps but only enter information for the appropriate month.

Category	Metric	Qrtr	SS Value	D / M / E Value	Combined Value	Quarterly Trend	Quarterly Score
Cost	Cost Variance CV%	FY04 Q4	-5%		-5%		G
		FY05 Q1	9%		9%		
		FY05 Q2					
		FY04 Q3					

Based on the Cost Variance % formula shown in the adjacent figure, the report assigns scores based on the following ranges:

Blue = CV% is greater than 10%
Green = CV% is greater than – 6%
Yellow = CV% is between –6% and –9%
Red = CV% is less than –10%

Cost Variance %
CV% = (BCWP-ACWP)/BCWP x 100%

M.2.2.2 Schedule Category

This is the project's cumulative Schedule Variance Percentage (SV %), rounded to the nearest one percent. The SV% provides a snapshot of the project's Schedule Variance history. If entering directly into the Quarterly Reporting Template tab, enter the SV% into the SS Value cell and or DME Value cell, and enter the total SV% into the Combined Value cell adjacent to the current Quarter. If using the Excel spreadsheet to calculate values, update the EV Summary tab (bolded cells with a border only) and the SV% will be calculated automatically. If using the Monthly Report, follow the same steps but only enter information for the appropriate month.

Category	Metric	Qrtr	SS Value	D / M / E Value	Combined Value	Quarterly Trend	Quarterly Score
Schedule	Schedule Variance SV%	FY04 Q4	-13%		-13%		B
		FY05 Q1	10%		10%		
		FY05 Q2					
		FY04 Q3					

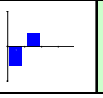
Based on the Schedule Variance % formula shown in the adjacent figure, the report assigns scores based on the following ranges:

Blue = SV% is greater than 10%
Green = SV% is greater than – 6%
Yellow = SV% is between –6% and –9%
Red = SV% is less than –10%

Schedule Variance %
SV% = (BCWP-BCWS)/BCWS x 100%

M.2.2.3 Estimate at Completion Category

The OMB Exhibit 300 allows for Estimate at Completion (EAC) to be calculated using two different formulas. One EAC measure is based purely on the Cost Performance Index, the other is based on a combination of the Cost and Schedule Performance Indices. Both measures provide predictions about how the project *will* perform. If entering directly into the Quarterly Reporting Template tab, enter the VAC% into the SS Value cell and/or DME Value cell. If using the Excel spreadsheet to calculate values, update the EV Summary tab (bolded cells with a border only) and both VAC% numbers will be calculated automatically. If using the Monthly Report, follow the same steps but only enter information for the appropriate month.

Category	Metric	Qrtr	SS Value	D / M / E Value	Combined Value	Quarterly Trend	Quarterly Score
Estimate At Completion	Variance at Completion $_1$ VAC_1 %	FY04 Q4	-5%		-5%		G
		FY05 Q1	9%		9%		
		FY05 Q2					
		FY04 Q3					
	Variance at Completion $_2$ VAC_2 %	FY04 Q4	-11%		-11%		G
		FY05 Q1	8%		8%		
		FY05 Q2					
		FY04 Q3					

Based on the VAC % formula shown in the adjacent figures, the report assigns scores based on the following ranges:

Blue = CV% is greater than 10%
Green = CV% is greater than – 6%
Yellow = CV% is between –6% and –9%
Red = CV% is less than –10%

Variance at Completion 1 %
VAC 1 % = (BCWP-EAC1)/BAC x 100%
VAC 2 % = (BCWP-EAC2)/BAC x 100%

M.2.2.4 Total Earned Value Score

The Total Earned Value Score reflects the lowest score among the Cost, Schedule, and Estimate at Completion categories. For example, if 3 of 4 metrics are Green and the 4th category is Red, a Red score is reported. The overall project color signifies the following:

Green = Project is on target.

Yellow = Project is within scope in all of the measured criteria, BUT the Project Manager is expressing concern about the potential for a deviation from plan.

Red = Project is out of scope in one or more of the measured criteria AND the Project Manager does not have the ability within the limits of their authority and resources to bring the criteria back to within the threshold limits. The Project Manager is asking for, or needs, immediate assistance.

Current DOI procedures provide the status of all Projects to OMB as part of the DOI quarterly reporting process.

M.2.3 Reporting Collaboration Information

Collaboration Category

This category reflects the commitment demonstrated by the investment's partners (e.g., industry, other agencies, State, local, or Tribal governments). This section is mandatory for DOI investments that have been categorized as "E-Gov" or "Cross-Cutting" by the DOI IRB. This section is not applicable for investments categorized as "Bureau Specific" by the DOI IRB. A fully collaborative project requires each partner's full participation as the Department and Federal Government transitions to single enterprise-wide or Federal-wide systems. For interagency or collaborative projects for which DOI is the managing partner, please describe the status of each participating partner's funding participation, whether the project is meeting its milestones for migration or integration, and partner's participation in decision-making. For interagency or collaborative projects for which DOI is a participating partner, please describe the status of DOI Office of the Secretary and Bureau funding participation, whether the project is meeting DOI milestones for migration or integration, and DOI's participation in decision-making. If the investment is not a collaborative project, answer "Y" and state, "This is not a collaborative investment."

The Report Templates automatically assigns an overall score based on self scoring for each question. If a response is "Y," enter "G" in the self scoring cell. If a response is "N," enter "R" in the question's self scoring cell. If the response is Not Applicable, enter "NA" in the self scoring cell.

If a response is "N", but in the PM's expert judgment, the corrective action will positively resolve the situation or the question is not relevant, a G entered into the question's self scoring cell.

The Overall Score is Red if any response receives a Red score. If all scores are Green, the Overall Score is Green.

	Question	Y, N, or NA	If NO, what corrective action is being taken?	G Self Score G,R,NA
Collaboration (Interagency or Collaborative Projects)	Are partners providing required funding as planned? (Yes / No)	Y		G
	Are System Integration / Migration / Retirement Milestones being achieved as Planned? (Yes / No)	Y		G
	Are partners actively participating in decision-making activities? (Yes / No)	Y		G

M.2.4 Reporting Risk Information

Risk Category

This category is a snapshot of the project's risk management assessment. Project managers must maintain updated risk management plans from which this data should be extracted. For the identified risks, preferably high probability – high impact, please describe 1) the risk, 2) the consequence, and 3) the mitigation plan or desired managerial action. These risks should be those that have significantly impacted project performance since the last report or are anticipated to impact project performance during the next reporting period.

For each risk description, assign either a "G" or "R" in the self scoring cell. A "G" is assigned if the mitigation plan or managerial action will reduce the consequence to an acceptable level. An "R" is assigned if the consequence cannot be reduced to an acceptable level.

The Overall Score is Red if any response receives a Red score. If all scores are Green, the Overall Score is Green.

Risk	**For the 2 most relevant risks affecting current or upcoming project performance,** please 1) describe the risk; 2) the consequence; and, 3) the mitigation plan or desired managerial action.		**G**
Description	**Consequence**	**Mitigation Plan or Desired Managerial Action**	Self Score G or R
Interoperability Risk - The system may not operate with other interfaces as designed.	Schedule and cost delay	Rescope Effort	G
			G

M.2.5 Comments and Signatures

The Project Manager should provide any explanatory comments in the Comment block including a brief assessment of overall project health.

OMB seeks to avoid projects that duplicate Presidential E-Gov initiatives. As such respond "Y" or "N" to the certification questions located in the signature block.

While the reports will be forwarded electronically to the CIO through the project's respective DOI IRB member, project managers are expected to obtain their signatures for the files.

M.2.5.1 Reports Verification and Validation

These scores are intended to reflect verifiable project information. A Project Manager is expected to base *Scorecard* scores on verifiable reports, data, or information, and retain the supporting documentation. To enhance reporting integrity, PMD will designate teams to validate Project Manager scores by reviewing supporting documentation. Supporting documentation should include:

- eCPIC Exhibit 300 reports and or Contractor Cost Performance Reports,
- Current risk management plans, and
- Signed and dated Quarterly Reports.

M.3 Corrective Actions Report

Project Managers must complete a *Corrective Actions Report* for each issue Category for any project that reports:

- A "yellow" and or "red" light in any *Scorecard* category,
- An "improving but still outside control bounds" and/or "deteriorating" trend in any *Scorecard* category, or
- Corrective actions taken since the previous *Scorecard*.

Figure M-5 is the template for the *Corrective Action Report*. The *Corrective Action Report(s)* must accompany the *Scorecard*.

Corrective Actions Report (If any Scorecard category scores a red, complete one report for each issue identified)	
Project Name:	**Date:**
Project Manager:	**Quarter or Month:**
Category: *Scorecard Category*	
Issue: *Brief descriptor*	
Cause: *Description*	
Impact: *Describe how issue impacts Scorecard category(s) and specify impact on cost ($) and or schedule (e.g.,, days, weeks, months)*	
Corrective Actions Response: *Provide step-by-step corrective actions; effect on staffing, cost and or schedule. Discuss external risks that cannot be addressed within project.*	
"Get Well" Date:	
Comments (Project Sponsor Only):	

Project Manager Signature & Date		**Project Sponsor** Signature & Date

Figure M-5: *Corrective Actions Report Template*

M.3.1 Category	*Identify* the Category from the *Scorecard* that you are addressing. Only one *Corrective Action Report* should be completed for each Category.
M.3.2 Issue	*Identify* or *name* the issue. This name will be used to track or monitor the project's Corrective Action in subsequent quarterly reporting periods.
M.3.3 Cause	*Describe* the cause of the problem or issue in detail.
M.3.4 Impact	*Describe* how the issue relates to one or more *Scorecard* category(s) (e.g., Cost, Schedule, and Estimate to Completion, Performance, or Risk) and impacts the cost (e.g., estimated dollar impact) or schedule (e.g., days, weeks, and months).
M.3.5 Corrective Actions	*Describe* your planned corrective actions, including step-by-step corrective actions. Explain the consequences to staffing (government or contractor), cost estimates or schedule (e.g., days, weeks, months) using a time-phased budget. Discuss external issues that cannot be addressed within the project.
M.3.6 "Get Well" Date	*Indicate* when the corrective action(s) will be completed.
M.3.7 Project Manager	Upon completion of the *Corrective Actions Report*, sign and date the Report. Submit the *Scorecard* and *Corrective Actions Report(s)* to the Project Sponsor.
M.3.8 Project Sponsor Comments	*Review* the *Corrective Actions Report(s)* and provide any comments. The *Corrective Actions Report(s)* and the *Scorecard* must be submitted through the respective Bureau CIO (or CPIC designee) to the Department CIO. A sample *Corrective Actions Report* is provided in **Figure M-6**:

Corrective Actions Report (If any Scorecard category scores a red, complete one report for each issue identified)	
Project Name: Global Recreation Project	**Date:** 10/1/04
Project Manager: Bill D. Bridges	**Quarter/ or Month:** 4
Category: Cost Category	
Issue: Contractor Security Clearances	
Cause: Bureau security requirements were changed in June 2004. As a result, all contractors working on the Project were prevented from accessing secure Bureau facilities. All contractors must be cleared by Security before continuing to work in Bureau facilities.	
Impact: This issue impacts both cost and schedule variances. The overall project schedule will be delayed 4 weeks, since the Prime contractor took 4 weeks in May to establish an off-site facility that mirrors the Bureau's system. These new security clearances will cost the project an additional $5,000 per contractor; affecting 35 contractors; and, totaling $175,000. The cost to establish the alternate site; to pay Contractor rental expense; and, pay off-site Contractor labor rates is estimated to total an additional $500,000 than originally projected. In total, the schedule delay is 4 weeks, and cost impact is an additional $675,000. The risk management plan did not anticipate this event.	
Corrective Actions Response: OPM will complete preliminary security clearances by October 30, 2004 Bureau's Security Office will authorize temporary clearance by November 30, 2004, pending OPM final security clearances. Project and contractor staff will resume activities at Bureau facilities by December 31, 2004. OPM will finalize security clearances by January 30, 2005, wherein Bureaus Security Office will simultaneously approve contractor's clearances. Program Office will provide additional funding to contract. Monthly costs allocations are as follows: May: $50,000 June: $150,000 July: $50,000 August: $50,000 September $50,000 October: $50,000 November: $50,000 December: $225,000	
"Get Well" Date: January 30, 2005	
Comments (Project Sponsor Only):	
Project Manager Signature & Date	**Project Sponsor** Signature & Date

Figure M-6: *Corrective Actions Report Sample*

Appendix N: CPIC Process Assessment

N.1 Introduction

In 2000, the Government Accountability Office (GAO) published an exposure draft of *Information Technology Investment Management: A Framework for Assessing and Improving Process Maturity (ITIM)*. This Framework is based upon the select or control or evaluate approach described in the Clinger-Cohen Act of 1996 for selecting and managing Information Technology (IT) investments. Later in March 2004, GAO released Version 1.1 of its ITIM Framework. The ITIM Framework is composed of 5 stages of increasing maturity, as shown in **Figure Q-1** and provides the following:

A rigorous, standardized tool for internal and external evaluations of IT investment processes,

A consistent and understandable mechanism for reporting the results of IT assessments, and

A road map that agencies can follow in improving their IT investment processes.

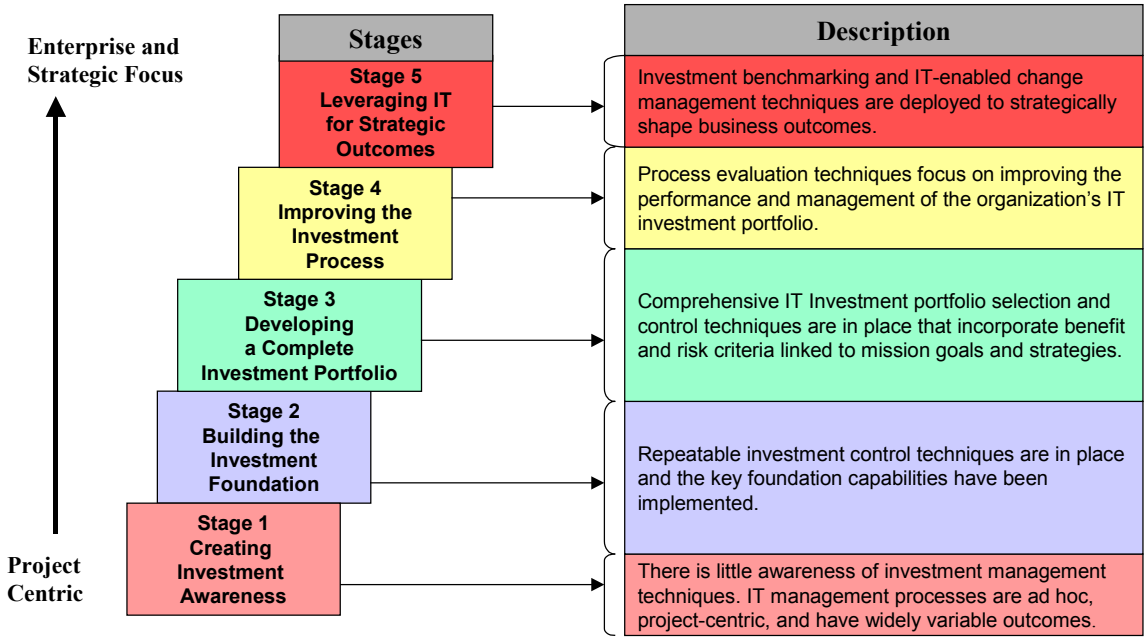


Figure N-1. *ITIM Stages of Maturity*

Each ITIM stage contains critical processes that in turn contain component key practices. Each critical process and each key practice within an ITIM stage must be met in order to fully achieve an ITIM stage rating.

The Department of the Interior (DOI) and its Bureaus are implementing ITIM-related processes while addressing recommendations from GAO. The ITIM Self Assessment Tool was developed to aid the DOI with ITIM assessments, highlight strengths and weaknesses, and assist with planning. The ITIM Self Assessment Tool is designed for use on Microsoft Excel Version 2000 or later. The ITIM Self Assessment Tool is a self-contained spreadsheet developed in Microsoft Excel, and requires no special installation procedures. A copy can be obtained by contacting OCIO CPIC Working Team at OS_PIO_CPIC@ios.doi.gov

This document provides guidance on using the ITIM Self Assessment Tool to determine an organization's maturity level.

N.2 ITIM Self Assessment Tool

The data is organized into tabs to allow for easy presentation and data entry. Each tab in the ITIM Self Assessment Tool is explained in **Figure O-2**.

#	Name	Notes
1	Summary	Provides high-level ITIM rating results. There is no user input on this tab.
2	Graphics	Graphically depicts the progress for each key practice within each ITIM maturity level. There is no user input on this tab.
3	Critical Processes	Provides progress details for each key practice within each ITIM maturity level. There is no user input on this tab.
4	Stage2	Captures the user's input for the ITIM Stage 2 self-assessment.
5	Stage3	Captures the user's input for the ITIM Stage 3 self-assessment.
6	Stage4	Captures the user's input for the ITIM Stage 4 self-assessment.
7	Stage5	Captures the user's input for the ITIM Stage 5 self-assessment.

Figure N-2. *ITIM Self Assessment Tool Tabs*

Before using the tool, the user needs to obtain a copy of version 1.1 of GAO's *Information Technology Investment Management: A Framework for Assessing and Improving Process Maturity (ITIM)*, and become familiar with the ITIM stages and the evidence and artifacts required to fulfill each key practice.[1]

Using the information in the GAO guidance, along with the evidence collected to support each key practice for each ITIM stage, assess whether the practices are in place by selecting the rating from the "Rating" drop-down box, using the following definitions:

[1] Version 1.1 of the ITIM Framework can be obtained from www.gao.gov/cgi-bin/getrpt?GAO-04-394G.

Executed—The practice is in place.

NA—The practice is not relevant to the Bureau or Department's particular circumstances.

Not Executed—The Bureau or Department does not exhibit any aspect of the practice in place.

Partially Executed— The Bureau or Department has some, but not all, aspects of the practice in place. Examples of circumstances in which the Bureau or Department would receive this designation include:

(1) Some, but not all, of the elements of the practice were in place;

(2) The Bureau or Department documented that it has the information or process in place but it was not in the prescribed form (e.g., in a specific document as required by law or the Office of Management and Budget (OMB));

(3) The Bureau or Department's documentation was in draft form; or

(4) The Bureau or Department has a policy related to the practice but evidence supported that it had not been completely or consistently implemented.

Enter the evidence that supports the selected rating in the "Summary of Evidence or Comments" column, and supply the point of contact (POC) for the evidence in the POC column. This will greatly aid in not only identifying potential weaknesses, but also in preparing for a GAO audit. Following entry of the data, the results will be displayed in the "Summary," "Graphics," and "Critical Processes" tabs.

Appendix O: Glossary of Terms and Acronyms

O.1 Glossary of Terms

Acquisition Plan	Description of the acquisition approach including: ■ Contract strategy (definition of government and contractor roles and responsibilities) ■ Use of COTS software ■ Major milestones (such as software releases, hardware delivery and installation, and testing).
Actual Cost of Work Performed	The costs actually incurred and recorded in accomplishing the work performed within a given time period.
Architectural Alignment	Degree to which the IT initiative is compliant with DOI's information technology architecture.
Architecture	An integrated framework for evolving or maintaining existing technologies and acquiring new technologies to support the mission(s).
Benefit	Quantifiable or non-quantifiable advantage, profit, or gain.
Benefit-Cost Ratio	The Total Discounted Benefits of an investment divided by the Total Discounted Costs of the investment. If the value of the Benefit-Cost Ratio is less than one, the investment should not be continued.
Budget at Completion	The sum of all budgets established for the contract.
Budgeted Cost for Work Performed	The sum of the budgets for completed work packages and completed portions of open work packages, plus the applicable portion of the budgets for level of effort and apportioned effort.
Budgeted Cost of Work Scheduled	The sum of all WBS element budgets that are planned or scheduled for completion.
Business Case	Structured proposal for business improvement that functions as a decision package for organizational decision-makers. A business case includes an analysis of business process performance and associated needs or problems, proposed alternative solutions, assumptions, constraints, and risk-adjusted cost-benefit analysis (CBA). The Exhibit 300 business case is this document for DOI purposes.
Business Process	A collection of related, structured activities or chain of events that produce a specific service or product for a particular customer or group of customers.
Business Process Reengineering	A systematic, disciplined approach to improving business processes that critically examines, rethinks, and redesigns mission delivery processes.
Capital Asset	Tangible property, including durable goods, equipment, buildings, installations, and land.

Control Phase	Capital planning phase that requires ongoing monitoring of information

	technology investments against schedules, budgets, and performance measures.
Cost-Benefit Analysis	An evaluation of the costs and benefits of alternative approaches to a proposed activity to determine the best alternative.
Cost Performance Index	Earned value divided by the actual cost incurred for an investment.
Cost Variance	Earned value minus the actual cost incurred for an investment.
Customer	Groups or individuals who have a business relationship with the organization; those who receive or use or are directly affected by the products and services of the organization.
Data Documentation	Compilation of materials including data dictionary, decomposition diagrams, and data models.
Design Documentation	Document that includes system design diagrams.
Discount Factor	The factor that translates expected benefits or costs in any given future year into present value terms. The discount factor is equal to 1/ (1 + I) *t* where *I* is the interest rate and *t* is the number of years from the initiation date for the program or policy until the given future year.
Discount Rate	The interest rate used in calculating the present value of expected yearly benefits and costs.
Earned Value Analysis	A structured approach to project management and forecasting including comparisons of actual and planned costs, work performed, and schedule.
Estimate at Completion	The actual costs incurred, plus the estimated costs for completing the remaining work.
Estimate to Complete	The cost necessary to complete all tasks from the actual cost of work performed end date through the investment's conclusion.
Evaluate Phase	Capital planning phase that requires information technology investments to be reviewed once they are operational to determine whether the investments meet expectations.
Expected Outcome	Projected end result of the initiative (e.g., system(s) being replaced or improved customer service) that is directly linked with performance measures.
Feasibility Study	Preliminary research performed to determine the viability of the proposed initiative by performing an alternatives analysis, including market research and extensive interviews with subject matter experts. Also includes a proposed technical approach and preliminary cost, scope, and schedule data.
Functional Requirements	A description of system capabilities or functions required to execute a required process such as a communication link between several locations and generating specific reports.

Hardware or Equipment	Includes any equipment used in the automatic acquisition, storage, manipulation, management, movement, control, display, switching,

	interchange, transmission, or reception of data or information (e.g., computers and modems); capital and non-capital purchases or leases.
Independent Verification and Validation	An independent review conducted by persons separate from the management and operation of the investment or system.
Inflation	The proportionate rate of change in the general price level, as opposed to the proportionate increase in a specific price. Inflation is usually measured by a broad-based price index, such as the implicit deflator for Gross Domestic Product or the Consumer Price Index.
Information System	A discrete set of information resources organized for the collection, processing, maintenance, transmission, and dissemination of information in accordance with defined procedures, whether automated or manual.
Lifecycle	The duration of the system life typically organized into four phases: initiation, development, operation, and disposal.
Information Technology	Any equipment or interconnected system or subsystems or equipment used in the automatic acquisition, storage, manipulation, management, movement, control, display, switching, interchange, transmission, or reception of data or information.
Infrastructure	The IT operating environment (e.g., hardware, software, and communications).
Lifecycle Benefits	The overall estimated benefits for a particular program alternative over the time period corresponding to the life of the program including: ■ Cost or expense reduction (productivity and headcount), ■ Other expense reductions (operational), ■ Cost or expense avoidance, and ■ Revenue-related savings.
Lifecycle Cost	The overall estimated cost for a particular program alternative over the time period corresponding to the life of the program, including direct and indirect initial costs plus any periodic or continuing costs of operation and maintenance.
Management Reserve	The amount of the total allocated budget withheld for management control purposes rather than designated for the accomplishment of a specific task or set of tasks; not part of the performance measurement.
Net Present Value	The difference between the discounted present value of benefits and the discounted present value of costs. Also referred to as the Net Present Value.
Opportunity Costs	Cost of not investing in the initiative or cost of a forgone option.
Payback Period	The number of years it takes for the cumulative dollar value of the benefits to exceed the cumulative costs of an investment.
Performance Indicator	Description of: ■ What is to be measured, including the metric to be used (e.g., conformance, efficiency, effectiveness, costs, reaction, or customer satisfaction) ■ Scale (e.g., dollars, hours, etc.)

	■ Formula to be applied (e.g., percent of "a" compared to "b," mean time between failures, annual costs of maintenance, etc.) ■ Conditions under which the measurement will be taken (e.g., taken after system is operational for more than 12 hours, adjusted for constant dollars, etc.)
Performance Measurement Baseline	The time-phased budget plan against which investment performance is measured.
Performance Measures	Method used to determine the success of an initiative by assessing the investment contribution to predetermined strategic goals. Measures are quantitative (e.g., staff-hours saved, dollars saved, reduction in errors, etc.) or qualitative (e.g., quality of life, customer satisfaction, etc.).
Post-Implementation Review	Evaluation of the information technology investment after it has been fully implemented or terminated to determine whether the targeted outcome (e.g., performance measures) of the investment has been achieved.
Pre-Select Phase	Capital planning phase that provides a process to assess whether information technology investments support strategic and mission needs.
Project Plan	A document that describes the technical and management approach to carrying out a defined scope of work, including the project organization, resources, methods, and procedures and the project schedule.
Project Charter	A document issued by senior management that provides the project manager with the authority to apply organizational resources to project activities
Return	The difference between the value of the benefits and the costs of an investment. In a cost-benefit analysis it is computed by subtracting the Total Discounted Costs from the Total Discounted Benefits, and is called the Total Net Present Value.
Return on Investment	Calculated by dividing the Total Net Present Value by the Total Discounted Costs. To express it as a percentage, multiply by 100. It can also be expressed as (Total Discounted Benefits minus Total Discounted Costs) divided by Total Discounted Costs.
Risk	A combination of the probability that a threat will occur, the probability that a threat occurrence will result in an adverse impact, and the severity of the resulting impact.
Risk Management Plan	A description of potential cost, schedule, and performance risks, and impact of the proposed system to the infrastructure. Includes a sensitivity analysis to articulate the effect different outcomes might have on diminishing or exacerbating risk. Provides an approach to managing all potential risks.
Risk Management	The process concerned with identifying, measuring, controlling, and minimizing risk.
Schedule Variance	Earned value minus the planned budget for the completed work.
Security	Measures and controls that ensure the confidentiality, integrity, availability, and accountability of the information processes stored by a computer.

Security Plan	Description of system security considerations such as access, physical or architectural modifications, and adherence to Federal and DOI security requirements.
Select Phase	Capital planning phase used to identify all new, ongoing, and operational investments for inclusion into the information technology portfolio.
Sensitivity Analysis	An analysis of how sensitive outcomes are to changes in assumptions. Assumptions about the dominant cost or benefits elements and the areas of greatest uncertainty deserve the most attention.
Software	Any software, including firmware, specifically designed to make use of and extend the capabilities of hardware or equipment.
Steady State Phase	Capital planning phase that provides the means to assess mature information technology investments to ensure they continue to support mission, cost, and technology requirements.
Sunk Cost	A cost incurred in the past that will not be affected by any present or future decisions. Sunk costs should be ignored in determining whether a new investment is worthwhile.
Technical Requirements	Description of hardware, software, and communications requirements associated with the initiative.
Variance at Completion	The difference between the total budget assigned to a contract, WBS element, organizational entity, or cost account and the estimate at completion; represents the amount of expected overrun or under run.

O.2 Acronyms

AB	Annual Benefit
AC	Annual Cost
ACWP	Actual Cost of Work Performed
AS	Agency Sponsor
BAC	Budget at Completion
BCR	Benefit-Cost Ratio
BCWP	Budgeted Cost for Work Performed
BCWS	Budgeted Cost of Work Scheduled
BPR	Business Process Reengineering
CBA	Cost-Benefit Analysis
CCA	Clinger-Cohen Act
CFO	Chief Financial Officer
CIO	Chief Information Officer
COTS	Commercial-off-the-shelf
CPI	Cost Performance Index
CPIC	Capital Planning and Investment Control
CPWT	Capital Planning Working Team
CSBR	Cost, Schedule, Benefit, and Risk

CV	Cost Variance
DB	Discount Benefit
DC	Discount Cost
DF	Discount Factor
EAC	Estimate at Completion
EBT	Electronic Benefit Transfer
IRB	Investment Review Board
ETC	Estimate to Complete
EWG	Executive Working Group(s)
FASA	Federal Acquisition Streamlining Act
FM	Functional Manager
FTEs	Full-Time Equivalents
FY	Fiscal Year
GAO	Government Accountability Office
GISRA	Government Information Security Act of 2000
GPEA	Government Paperwork Elimination Act of 1998
GPRA	Government Performance and Results Act
GSA	General Services Administration
IPT	Integrated Project Team
IRM	Information Resource Management
ISSPM	Information System Security Program Manager
ISTA	Information System Technology Architecture
IT	Information Technology
eCPIC	Information Technology Investment Portfolio System
IV&V	Independent Verification and Validation
MNS	Mission Needs Statement
MR	Management Reserve
NIST	National Institute of Standards and Technology
NPV	Net Present Value
O&M	Operations and Maintenance
OCFO	Office of the Chief Financial Officer
OCIO	Office of the Chief Information Officer
OMB	Office of Management and Budget
PIR	Post-Implementation Review
PMB	Performance Measurement Baseline
PRA	Paperwork Reduction Act
RFP	Request for Proposals
ROI	Return on Investment
SV	Schedule Variance
SME	Subject Matter Expert
DOI	United States Department of the Interior
VAC	Variance at Completion
VPN	Virtual Private Network
WBS	Work Breakdown Structure

Appendix P: References

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