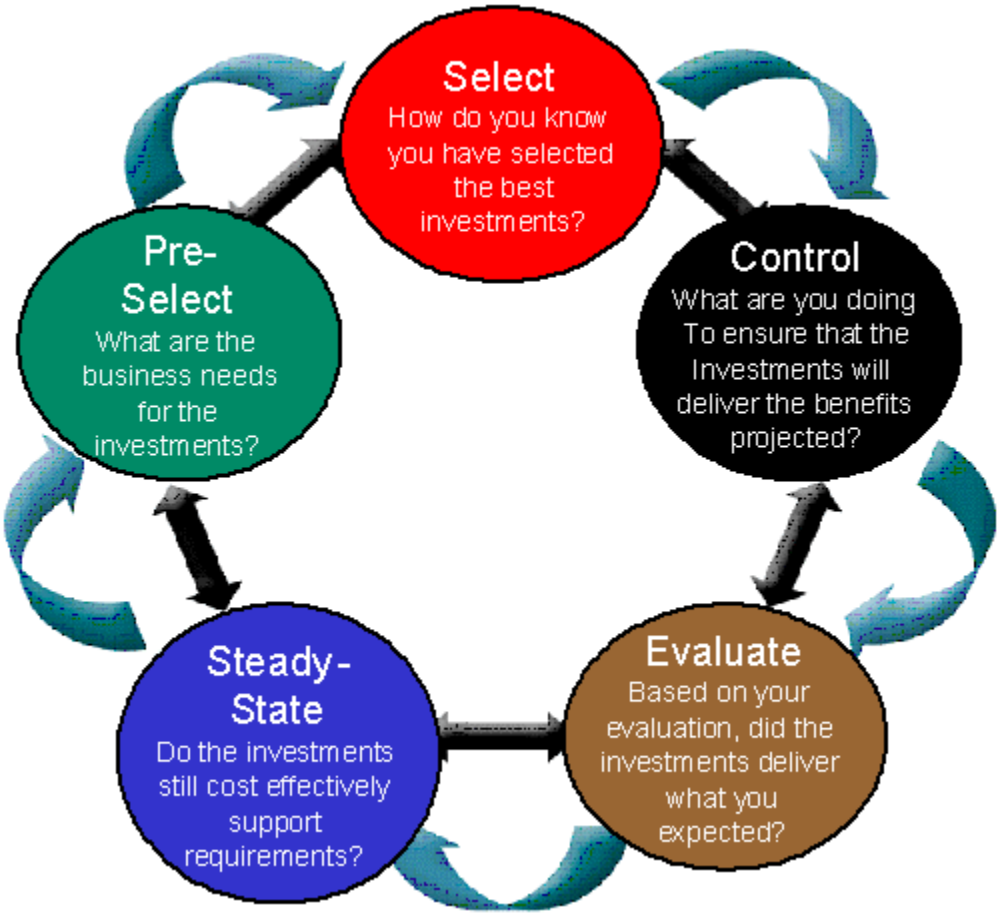
Information Technology Capital Planning and Investment Control Guide



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OFFICE OF THE CHIEF INFORMATION OFFICER

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EXECUTIVE SUMMARY

INFORMATION TECHNOLOGY CAPITAL PLANNING AND INVESTMENT CONTROL (CPIC) GUIDE

In 2002, the United States Department of the Interior (DOI) invested $811 million in information technology (IT) assets and services. The success of these IT investments directly influences the ability of component agencies within DOI to execute business plans and fulfill missions. For example:

- The National Integrated Land System (NILS) is a joint project between the Bureau of Land Management (BLM) and the United States Department of Agriculture Forest Service in partnership with the states, counties, and private industry to provide business solutions for the management of cadastral records and land parcel information in a Geographic Information System (GIS) environment.
- United States Geological Survey is the lead bureau for the GeoSpatial One Stop, one of the President's 24 E-GOV initiatives.

The Key Components

Recognizing both the importance of IT investments 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, supporting staff/tools, and repeatable processes. Each is described below:

- **Executive decision-makers**—Consists primarily of the Investment Review Board (IRB) and executive working groups appointed by the IRB. They oversee the process and are stakeholders in the success of DOI's CPIC.
- **Staff/Tools**—DOI uses a variety of tools to manage its IT investments. Adequate staff resources are allocated to support the processes.
- **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 Accounting 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**—Agency[1] business specialist propose IT investments. Executive decision-makers assess each proposed investment's support of DOI's strategic and mission needs and select promising investments for further analysis.
- **Select Phase**—Investment analyses are conducted and the IRB chooses the IT projects that best support the mission of the organization, support DOI's approach to enterprise architecture, and exhibit project management.
- **Control Phase**—DOI ensures, through timely oversight, quality control, and executive review, 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 project's impact on mission performance, identify any project changes or modifications that may be needed, and revise the

[1] Agency refers to organizational units, i.e. DOI or its Bureaus.

investment management process based on lessons learned.

- **Steady-State Phase**—Mature systems are assessed to ascertain their continued effectiveness in supporting mission requirements, evaluate the cost of continued maintenance support, assess potential technology opportunities, and consider 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.

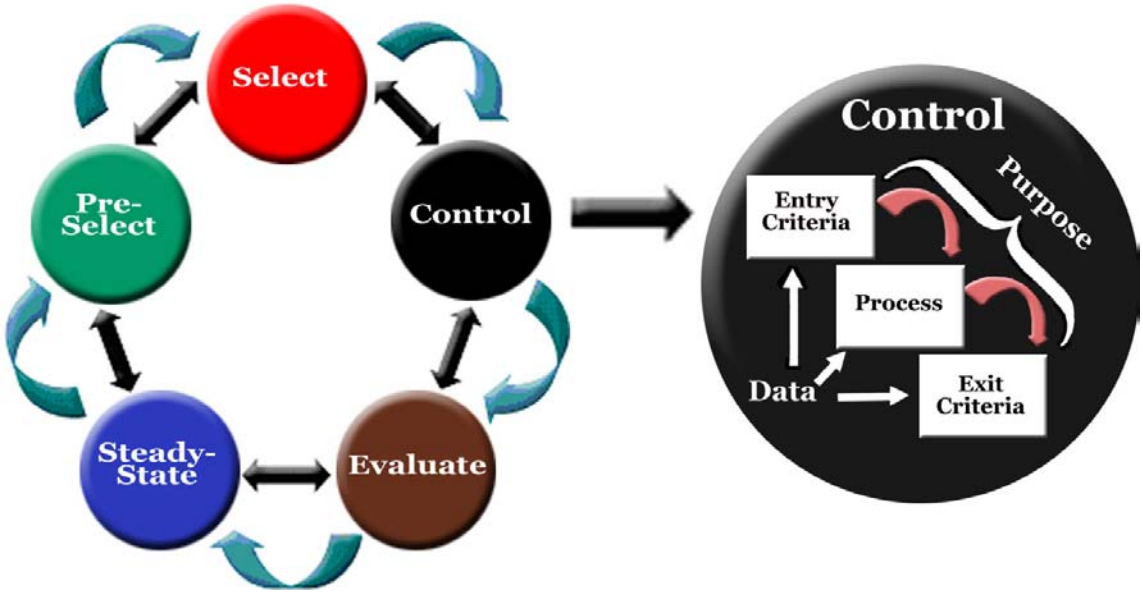

Figure ES-1. The Five CPIC Phases and the Common Elements within Each Phase

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
- 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 projects
  - Manage IT projects
  - 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 adopt 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.

DOI'S IT INVESTMENT MANAGEMENT PHILOSOPHY

1.4.1 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 projects supporting DOI programs are in harmony
4. The process used to select, control, and evaluate investment should be integrated with bureau and Department process for budget, financial and program decisions; and
5. Bureau and Department managers are responsible and accountable for management of respective IT investments.

This Guide has been developed in support of these principles.

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 General Accounting Office's (GAO) guidelines for IT Investment Management (ITIM) maturity framework. The Department's IT CPIC and Best Management Practices of government and industry will be incorporated in successive iterations of the 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 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.

1.5 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 projects, and postponing or even canceling projects.

The CPIC is a structured, integrated approach to managing IT investments. The CPIC ensures that all IT investments (or projects) align with the Department's mission and support 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 1, Information and Process Flow. The information flows shown in Figure 1 also represent a feedback mechanism to institutionalize lessons learned. Approved investments (budget Exhibit 300) become part of a larger investment portfolio (budget Exhibit 53) maintained by the OCIO. This portfolio contains an inventory of investments, as well as supporting strategic, technical, and financial information related to each project's risk and return profile. This information will be reported annually to the OMB through the I-TIPS. When all IT investments are consolidated into the department's portfolio, the OCIO can ensure that all systems work in concert with each other, including systems under development, systems currently in use, and systems scheduled for retirement and/or replacement.

IT 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 Agency 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.

1.6.1 Strategic and Performance Planning

GPRA requires all Federal agencies to develop strategic plans, develop annual performance plans that are tied to the Agency goals and budget allocation, and report the actual results against performance plans. DOI develops and maintains an Agencywide Strategic Plan that addresses Agency mission, goals and objectives, relationship of the goals and objectives to annual performance plans, and factors affecting achievement of business goals/objectives. The IT Capital Planning and Investment Control process links all IT investments to the strategic goals of the Agency. The business case for each IT investment must identify its linkage to the Agency'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 terminated.

A DOI Annual Performance Plan is developed to identify the major performance goals for the Agency. Each performance goal establishes a current baseline (a reference position) from which progress is measured consistent with the DOI strategic plan objectives. The plan includes a goal that measures the extent to which IT investments are maintained within 10% 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.

Enterprise Architecture

Agencies are required to establish an integrated EA and develop an IT security program that is consistent with, and an integral part of DOI''s EA. IT Investment Management, as illustrated in Figure 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 EA.

Capital Planning and Investment Control/EA Alignment

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 architecture can help the enterprise to:

- Analyze business processes;
- Ensure that automated systems optimally support the business processes;
- Acquire new systems;
- Streamline organizational structure and distribution of responsibilities across the enterprise;
- Facilitate IT Capital Planning and Investment Control; and
- 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 project information and the EA information. 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 business case criteria for the review and

evaluation of investments through the IT CPIC process.

IT Security

IT security is an explicit part of the IT CPIC process. All IT investments must demonstrate that costs of appropriate IT security controls are explicitly incorporated into the life cycle planning of an overall system in a manner consistent with GISRA 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 business case criteria for the review and evaluation of investments through the IT Capital Planning and Investment Control process.

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 the Agency budget request. All IT investments are to be included in the Federal budget request whether they are existing projects and systems, incremental increases for existing projects 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 Benefit Cost Analysis (BCA) 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 project.

DOI's IT CPIC process is closely aligned to the Agency'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 projects are justified based on the need to fill a gap in the Agency'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:

Information Technology Management Council (ITMC)

The Departmental level IT governing body is the ITMC. It is responsible for the following:

- Selecting, controlling, and evaluating all Information Technology investments at the national level.
- Defining the decision criteria that will be employed to select among IT projects for the DOI IT Investment Portfolio.
- Making final management decisions regarding the effective use of DOI IT investments and resources, including systems development, infrastructure, maintenance and IT consulting
- Approving, disapproving, or deferring judgment on each IT project 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 ITMC. 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:

- Review on going IT projects 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 projects.
- Conduct periodic reviews of project status, control, performance, risk and outlook for approved and funded IT projects.

Establish and execute the necessary project controls to manage requirements; risk; cost, schedule and technical baselines; and performance outcomes.

For further information on IT investment management or DOI's CPIC process, please contact Harriet Brown in the OCIO at either (202) 208-4109 or at Harriet Brown/PIR/OS/DOI@DOI.

CHAPTER 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.

IT system and infrastructure and office automation investments constitute nearly 96 percent of DOI's IT investment costs each year and can have significant impacts on the efficient and effective operation of DOI agencies and services. **Figure 1-1** shows the DOI IT budget components for fiscal year (FY) 2002.

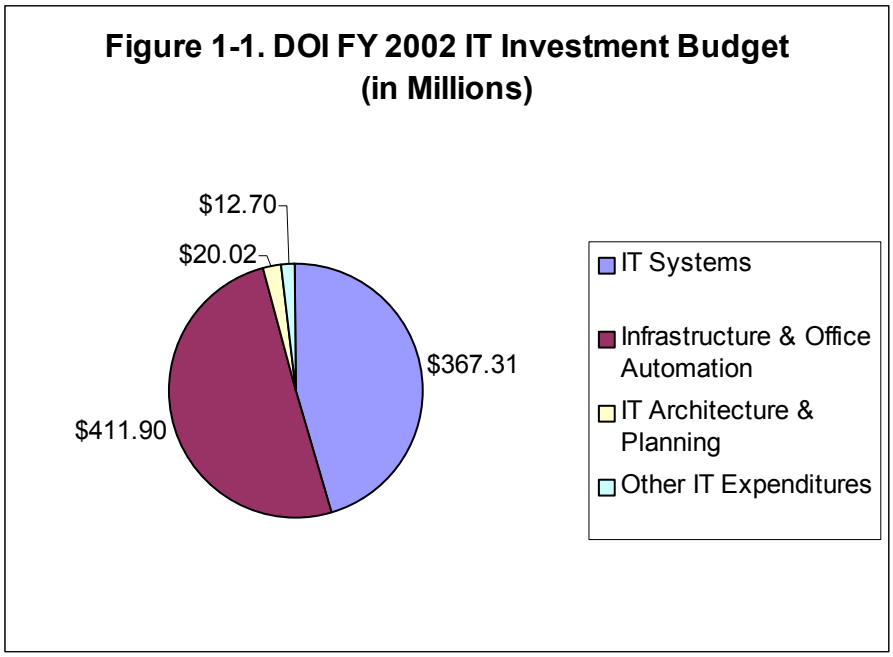

Figure 1-1. DOI FY 2002 IT Investments Budget (from Exhbit 53)

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) determines the IT direction for DOI, and ensures that agencies 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. These laws include:

- 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 Government Information Security Reform Act of 2001 (GISRA).

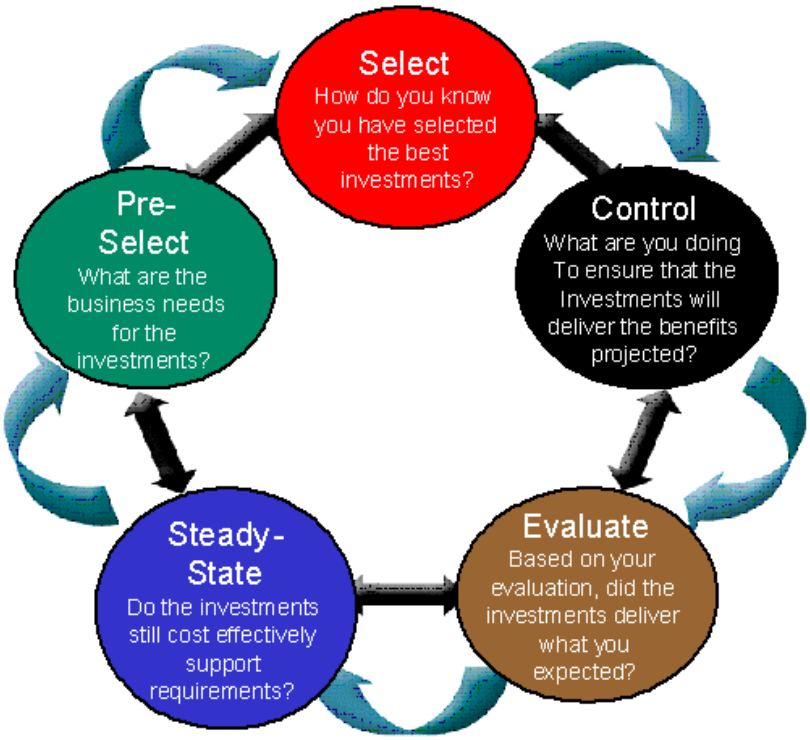

Figure 1-2. CPIC Information and Process Flow

This CPIC Guide is based upon the IT aspects of these laws, and focuses specifically on the CCA requirements. The CCA's objective is that senior managers use a CPIC process to systemically maximize the benefits of IT investments. The Act 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 information systems investment projects;
> 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 General Accounting Office (GAO), and others in the area of IT investment management. A list of investment management reference guides and memoranda is identified in **Appendix S**. 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 Harriet Brown in the OCIO at either (202) 208-4109 or at Harriet Brown/PIR/OS/DIO@DOI.

1.4 Scope

All IT investments within DOI must comply with this CPIC guidance. However, not all IT investments must be reviewed by the IRB. Only those IT investments that are considered to be "major" and strategic investments for the Department are required to be approved by the IRB. It is expected that each individual DOI bureau will have a similar CPIC process, manage its own portfolio, and create associated thresholds. At a minimum, each bureau is expected to use the CPIC process to manage its "significant" investments.

The thresholds for a project to be considered "major" are described in the following section.

1.5 Thresholds for Major IT Investments

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

- Total lifecycle costs greater than $35 million
- Multiple-agency impact[2]
- Mandated by legislation or executive order, or identified by the Secretary as critical
- Requires a common infrastructure investment
- Department strategic or mandatory-use systems
- Differs from or impacts on the Department infrastructure, architecture, or standards guidelines.
- All financial systems with a lifecycle 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 in nature or uses e-business technologies.

These investments are considered to be strategic for the Department and have a greater documentation burden. Each is individually reported to OMB on an Exhibit 300 Capital Asset Plan and Business Case (Exhibit 300). These investments form part of the IRB IT portfolio together with smaller investments from DOI bureaus.

1.6 Roles and Responsibilities

The following decision-making bodies and personnel may be established in the Bureaus and are assigned the responsibilities listed below.

Investment Review Board (IRB) - The governing and approval bodies responsible for ensuring that proposed investments meet DOI strategic, business, and technical objectives. Manages the overall agency IT portfolio.

[2] Lead agency as managing partner submits Exhibit 300.

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.

Office of Chief Information Officer (OCIO)—Responsible for setting IT policy, reviewing investments, and making recommendations.

Key Agency Personnel—The agency personnel responsible for investment management and successful completion of the CPIC.

Agency Head—Responsible official for signing CPIC documentation before submission to OCIO.

Agency Sponsor—Responsible official for providing executive sponsorship of the investment; should be a senior level executive within the applicable mission area or agency.

Project Sponsor/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 OCIO, EWG, and IRB.

Project Manager—Trained or experienced official responsible for management and completion of one or more IT investment projects.

IT Manager—Official responsible for serving as the primary point of contact for technology issues.

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

Contracting Specialist—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.

Capital Planning Analyst—Official responsible for serving as the primary interface for capital planning between the investment and OCIO.

Budget Analyst—Official responsible for serving as the primary interface between the investment and the Office of Budget (POB).

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 agencies and staff offices that have new IT investments meeting the "major" IT investment criteria should prepare an Exhibit 300 according to the guidelines provided in this document. Each Exhibit 300 is analyzed by OCIO for quality and conformance to policies and guidelines and reviewed against the applicable strategic investment criteria. OCIO prepares an investment analysis and forwards it, along with the agency investment, to an EWG. The EWG review the proposals and OCIO analyses and scores the investment initiative. A recommendation is then prepared and forwarded to the IRB for approval/disapproval. Approval, if granted, is an approval of concept for the pre-select phase, indicating that the agency or staff office 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 the agency budget process. The Exhibit 300 is further refined and submitted for IRB approval at each subsequent phase.

1.8 Process Coordination

Approved investments must move through the CPIC processes to obtain investment funding. The agency 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 document structure.

Chapter 2—Pre-Select Phase. Provides a process and mechanism to assess an investment's support of agency strategic and mission needs.

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

Chapter 4—Control Phase. Provides guidance to ensure that IT 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.

Appendices:

Board Procedures—Provides the IRB Charter that includes its roles and responsibilities.

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

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

Steady-State Investment Review Template—Provides a template for evaluating investments in the Steady-State Phase.

Cost-Benefit Analysis—Provides guidance on completing a Cost-Benefit Analysis (CBA)

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

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

Project Management—Provides guidance on managing IT investments.

Earned Value Analysis—Provides guidance on conducting earned value analysis.

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

Strategic Investment Criteria and Bonus Point Evaluation Tools - Provides the scoring criteria used by an EWG and the IRB during the annual investment review.

eGovernment - Provides guidance on eGovernment information to support the investment.

OMB Exhibit 300 Capital Asset Plan and Business Case - This is the basic format for submitting the investment documentation to the OCIO and IRB for decision.

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

I-TIPS Requirements by Phase—Provides a summary of the data required in the Information Technology Investment Portfolio System (I-TIPS) for each CPIC phase.

Quarterly/Milestone Control Review Checklist—Lists the critical areas the Control Review Team discusses during each Quarterly/Milestone Review.

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

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

CHAPTER 2—PRE-SELECT PHASE

2.1 PURPOSE

The Pre-Select Phase provides a process to assess a proposed investment's support of agency strategic and mission. It is during this phase that the business/mission need is identified and relationships to the Department and/or agency strategic planning efforts are established. (see Appendix M). 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 and initial project planning efforts in preparation for inclusion in the Department's investment 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 and meet at least one of the threshold criteria identified in section "1.5—Thresholds for Major IT Investments."

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 (see **Appendix C—Mission Needs Statement**) are closely linked to the strategic planning process of the DOI and sponsoring agency. Following mission analysis, the Project Sponsor/Functional Manager further develops the proposed solution's concept. A preliminary Exhibit 300 with budget estimates and associated CBA are completed.

Table 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 following the table:

Process Step	Responsible Individual(s) or Group(s)
Identify Project Sponsor.	Agency Sponsor
Conduct mission analysis.	Project Sponsor/Functional Manager Proponent
Develop concept.	Project Sponsor/Functional Manager Proponent
Prepare initial Exhibit 300.	Project Sponsor/Functional Manager Project Manager
Review the initial Exhibit 300.	Agency Sponsor
Approve initial Exhibit 300.	Agency Head
Review initiative and recommend appropriate action.	OCIO EWG
Make final investment decisions on the Exhibit 300.	IRB

Table 2-1. Pre-Select Phase Process Steps

2.3.1. Identify Project Sponsor

The Agency 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. 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 and/or agency's assets to satisfy existing and emerging demands for services. Mission analysis enables the Department and/or agency 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 both the Department's and the sponsoring agency'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 C—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 agency and/or 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 agency 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 agency 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 agency's infrastructure.

If the mission analysis reveals a non-IT solution (e.g., a rulemaking/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 (i.e. agency 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/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 principal activities of mission analysis are:

- 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.

Identify, analyze, and quantify capability shortfalls (i.e., 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 initial Exhibit 300.

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 agency should commit to resolving it based on worth, criticality, and the scope of likely changes to the agency's IT asset base. This information forms the basis for establishing the priority of this need in competition with all other agency and/or 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:"

Does the investment in major capital asset support core/priority mission functions that need to be performed by the Federal Government?

Does it have to be undertaken by the requesting agency because no alternative private sector or government source can more efficiently support the function?

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 agency standards for Enterprise Architecture Planning, Security & Privacy, and eGovernment Planning.

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

Conduct preliminary planning and develop a Concept Management Plan addressing Select Phase preparation, alternative analysis approach, and business redesign/reengineering. (Raines' Rules 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 initial Exhibit 300.

2.3.4. Develop Preliminary Business Case

The initial Exhibit 300 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/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. Initial Exhibit 300 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 N—IT Security Plan/Policy.**

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.

2.3.5. Prepare Initial Exhibit 300

The Project Manager, Project Sponsor/Functional Manager, and Agency Sponsor prepare the initial Exhibit 300 in preparation for DOI's investment reviews.

The format for submitting the Initial Exhibit 300 is the revised OMB Exhibit 300 found in Appendix M.

2.3.6. Review/Approve Investment Submission

The Agency Head reviews the investment submission and requests the Project Sponsor/Functional Manager and/or Agency Sponsor to update the Exhibit 300, or make changes as needed. The Agency Head then approves the investment submission and forwards it to the OCIO.

2.3.7. Review Initiative and Recommend Appropriate Action

The OCIO reviews the Exhibit 300 and provides any comments and/or questions to the agency. The agency addresses the issues and sends an updated Exhibit 300 to the OCIO. The OCIO forwards the updated Exhibit 300 with its assessment to an EWG for review. The EWG assesses the investment with an emphasis on mission alignment and the proposed concept management plan. This information is then linked to future portfolio selection decisions. The EWG forwards their investment recommendations to the IRB for the final decision.

2.3.8. Make Final Investment Decisions

The IRB reviews the EWG's recommendation and makes the final investment decisions. If the IRB approves the EWG's recommendation, the Agency Sponsor 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.

CHAPTER 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 (i.e., have a trained or experienced project manager, risk management, etc.). 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 (**Appendix H—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 submissions are assessed against a uniform set of evaluation criteria and thresholds, as identified in OMB Circular A-11, Section 300. The investment's CSBR are then systematically scored using objective criteria and the investment is ranked and compared to other investments. Finally, the 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, acquisition plan, risk management, 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.

Table 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 following the table:

Process Step	Responsible Individual(s) or Group(s)
Review the Mission Needs Statement and update if needed.	Project Sponsor/Functional Manager Proponent
Approve Integrated Project Team membership.	Agency Head
Identify funding source and obtain agency approvals.	Agency Sponsor
Develop Exhibit 300 supporting materials.	Project Manager
Prepare Exhibit 300.	Project Manager
Review/approve Exhibit 300.	Agency Head
Review initiative and recommend appropriate action.	OCIO EWG
Make final investment decisions.	IRB

Table 3-1. Select Phase Process Steps

3.3.1. Review the Mission Needs Statement and Update if Needed

The Project Sponsor/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/Functional Manager develops quantifiable performance measures that focus on outcomes where possible (see **Appendix G—Performance Measurement**).

These performance measures will form a basis for judging investment success.

3.3.2. Approve Integrated Project Team Membership

The Agency 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 OCIO will work with and provide guidance to the IPT throughout the process.

The IPT should consist of functional experts in the following areas:

- Functional Manager
- IT Manager
- Security Specialist
- Agency Budget Analyst
- Contracting Specialist

Additional team members may be added from other functional areas.

3.3.3. Identify Funding Source and Obtain Agency Approvals

The Project Sponsor identifies a potential funding source for the IRB to continue investment support. The Project Sponsor then gets approval from the offices listed in **Table 3-2**, depending upon the investment's characteristics.

Characteristic that triggers office approval request	Contact Office
Investment exceeds agency threshold.	OCIO
Investment involves an appropriation, accounting, or financial system.	Office of Chief Financial Officer (OCFO)
Investment more than $25 million.	Office of Policy, Management and Budget (OPMB)
Determining acquisition strategy.	Contracting Officer
Legal review of solicitation documents.	Office of the Solicitor General
Ensure investment is included in budget submission.	OPMB

Table 3-2. Approval Requirements

3.3.4. Develop Exhibit 300 Supporting Materials

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

Business Profile:

- Exhibit 300 with Performance Measures (see **Appendix G—Performance Measurement**) and mission needs statement
- Business Process Reengineering Studies
- Concept of Operations Plan
- eGovernment Plan
- Stakeholder Identification and Requirements
- Functional Requirements
- Feasibility Study

Risk Profile:

- Risk Management Plan (see **Appendix F—Risk Management**)

Financial Profile:

- Return on Investment (ROI) and CBA (see **Appendix E—Cost-Benefit Analysis**)
- Update lifecycle cost projections
- Alternatives Analysis
- Funding Source Identification

Technological Profile:

- Technical Requirements
  - Security Plan (see **Appendix N – IT Security Plan/Policy**)
- Enterprise Architecture Plan (see http://www.doi.gov)
- Relationship to Existing Systems (dependencies)
- Prototype/Pilot Plans

Project Management and Planning Profile

- Project Plan, including a list of team members
- Acquisition Plan and strategy

3.3.5. Prepare Exhibit 300

The Project Manager prepares the Exhibit 300.

3.3.6. Review/Approve Exhibit 300

The Agency Head reviews the Exhibit 300 and requests the Project Sponsor/Functional Manager, and/or Agency Sponsor to update the package or make changes as needed. The Agency Head then approves the submission and sends it to the OCIO.

3.3.7. Review Initiative and Recommend Appropriate Action

The OCIO reviews the investment based on the established criteria, and develops findings and recommendations. The OCIO forwards the package to an EWG for review. The EWG reviews the investment for compliance with Departmental strategic, legislative, and budgetary goals. The EWG uses standard criteria to objectively compare investments based on the data presented, and scores projects using the criteria listed in **Appendix K—Strategic Investment Criteria and Bonus Point Evaluation Tools**. The EWG forwards its findings and recommendations to the IRB for the final decision.

3.3.8. Make Final Investment Decisions

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

3.4 EXIT CRITERIA

Prior to exiting the Select Phase, investments must have:

- 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.

CHAPTER 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/performance of ongoing IT investments against projected cost, schedule, performance, and delivered benefits. The 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. DOI reviews occur before the annual budget preparation process. Quarterly/Milestone control reviews (see **Appendix Q—Quarterly/Milestone Control Review Checklist**) are conducted, as identified in the project plan.

Based on the quarterly/milestone control reviews, the 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:

- 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, agency CIOs provide the OCIO and the EWG with investment reviews to assist them in monitoring all investments in the portfolio. Investment reviews provide an opportunity for Project Managers to raise issues concerning the IT developmental process, including security, telecommunications, enterprise architecture alignment, eGovernment (GPEA compliance), Section 508 concerns, etc.

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

The EWG and IRB review project performance, and take corrective action if the project performance variance exceeds 10 percent from the project's established baseline.

The EWG and 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.

Table 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 following the table:

Process Step	Responsible Individual(s) or Group(s)
Establish and maintain project costs, schedule, benefits and risks, and technical baselines.	Project Manager
Maintain current project costs, schedule, technical, and general status information.	Project Manager
Assess project progress against performance measures.	Project Sponsor Project Manager Agency Sponsor
Prepare quarterly/milestone control review documents.	Project Manager
Evaluate quarterly/milestone control review documents.	Project Sponsor
Review control documents and recommend appropriate action.	OCIO EWG
Make final control review decisions.	IRB
Work with Project Manager to implement decisions.	OCIO EWG Project Sponsor

Table 4-1. Control Phase Process Steps

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

The Project Manager establishes the project management and executive plans, 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 Sponsor monitors financial, technical, operational, schedule, legal and contractual, and organizational risks. The Project Manager provides periodic updates to the OCIO 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 agency 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 actuals, what are the expectations of future performance).

The Agency Sponsor and Project Sponsor apply control screening criteria (see **Appendix K— Strategic Investment Criteria and Bonus Point Evaluation Tools.**

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

4.3.4. Prepare Quarterly/Milestone Control Review

The Project Manager updates the Exhibit 300 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.

4.3.5. Evaluate Quarterly/Milestone Control Review

The Agency Head evaluates the quarterly/milestone control review documents for project performance. The Agency Head endorses the investment and forwards the documentation to the OCIO.

4.3.6. Review Control Documents and Recommend Appropriate Action

The OCIO prepares findings and recommendations, and forwards the updated package to the EWG for review. The EWG reviews the investment and determines whether to provide continued support to the investment and forwards its recommendations to the IRB for the final decision (see **Appendix Q—Quarterly/Milestone Control Review Checklist**).

and EWG. The investment will undergo a comprehensive control review by the IRB. The results of these reviews are used by the EWG and IRB for management of the Department's IT investment portfolio.

4.3.7. Make Final Control Review Decisions

The IRB issues a decision, based upon the recommendations received from the EWG. 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 initiates 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:

- Complete investment development
- Confirm the PIR schedule
- Obtain IRB approval to enter the Evaluate Phase.

CHAPTER 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 actuals 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 agency, and results are reported to the OCIO, 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:

- Complete investment development
- Confirm the PIR schedule
- Obtain 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.

Table 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 following the table.

Process Step	Responsible Individual(s) or Group(s)
Conduct PIR and present results.	Project Sponsor
Prepare Exhibit 300.	Project Sponsor
Review/approve Exhibit 300.	Agency Sponsor
Review investment's PIR results and recommend appropriate action.	OCIO EWG
Make final investment decisions.	IRB
Evaluate IT capital investment management process.	Agency OCIO EWG IRB

Table 5-1. Evaluate Phase Process Steps

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 OCIO, as presented in **Table 5-1**.

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—The following areas should be reviewed to determine whether the investment is meeting its baseline goals:

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 F—Risk Management); and

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 N—Security Infrastructure Guide).

SAMPLE INITIATIVE EVALUATION SHEET				
General information				
Title:				
Description:				
Project Sponsor:				
OMB Code:				
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/mitigation review. Additional mitigation strategies and counter measures (if needed).				
Stakeholder Assessment				
General Comments				
Lessons Learned				
Project Management Assessment				
Technical Assessment				

Figure 5-1. IT Initiative Evaluation Data Sheet

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

5.3.2. Prepare Exhibit 300

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.

5.3.3. Review/Approve Exhibit 300

The Agency Sponsor reviews the Exhibit 300 and PIR results, and forwards them to the OCIO.

5.3.4. Review Exhibit 300 and PIR Results and Recommend Appropriate Action

The OCIO reviews the Exhibit 300 and PIR results. The OCIO prepares findings and recommendations, and forwards the updated package to an EWG for review. The EWG 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 IRB reviews an EWG's recommendation and makes the final investment decision.

5.3.6. Evaluate IT Capital Investment Management Process

An EWG may also recommend that the OCIO revise the CPIC process based on PIR results. A summary of the PIR activities and lessons learned are then presented by the OCIO to the EWG and IRB.

Following the completion of each phase, the OCIO and agencies document the strengths and weaknesses of the CPIC process. The information gathered in this evaluation is used to improve the CPIC process, 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 EWG. Agencies can use **Table 5-2** to record observations and forward them to the OCIO as necessary. Agencies can add appropriate comments as deemed necessary. The following are examples of things agencies can consider when addressing each phase:

Initiative Development

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

Screen

- Viability criteria
- Viability considerations
- Initiative designation

Score

- Mission criteria
- Risk
- ROI

Pre-Select

- Agency process
- OCIO/EWG review
- IRB endorsement

Select

- Agency process
- OCIO/EWG review
- IRB endorsement
- Security review

Control

- Milestone review format
- OCIO/EWG/corrective actions
- Security analysis

Evaluate

- PIR content
- PIR execution
- PIR recommendations
- Security performance

Steady-State

- System assessment
- Technology assessment
- Operations and Maintenance (O&M) review

To capture lessons learned, the Project Sponsor develops a management report and submits it to the OCIO. 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, 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 management report, including lessons learned, follows the outline provided in **Figure 5-2**.

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

5.4 Exit Criteria

Prior to exiting the Evaluate Phase, investments must have:

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

	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 (i.e., 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 I-TIPS able to support the activity in each phase in the process?								
List suggested corrective actions for any phase in the process.								
Comments:								

Table 5-2. IT Process Evaluation Data Sheet

INVESTMENT MANAGEMENT REPORT
Initiative Title:
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

Figure 5-2. Investment Management Report Data Sheet

CHAPTER 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:

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 D** provides a template for conducting Steady-State investment reviews.

Table 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 following the figure.

Process Step	Responsible Individual(s) or Group(s)
Analyze mission.	Project Sponsor Agency Sponsor
Assess user/customer satisfaction.	Project Sponsor
Assess technology.	Project Sponsor
Review O&M.	Project Sponsor Agency Sponsor
Prepare Exhibit 300.	Project Sponsor
Review/approve Exhibit 300.	Agency Sponsor
Review investment and recommend appropriate action.	OCIO EWG
Make final investment decisions.	IRB

Table 6-1. Steady-State Process Steps

6.3.1. Analyze Mission

The Project Sponsor and Agency 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/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 Sponsor 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 Sponsor monitors and maintains the existing technology and determines technology refresh schedules.

6.3.4. Review O&M

The Project Sponsor and Agency Sponsor 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 full-time equivalents (FTEs) should be included in all cost estimates and analysis.

6.3.5. Prepare Exhibit 300

The Project Sponsor updates actual costs and benefits for the investment. The format for submission is the Exhibit 300.

6.3.6. Review/Approve Exhibit 300

The Agency Sponsor reviews the investment submission. The Agency Sponsor approves the investment submission and forwards it to the OCIO.

6.3.7. Review Exhibit 300 and Recommend Appropriate Action

The OCIO reviews the Exhibit 300 and prepares findings and recommendations. The OCIO forwards it to an EWG for review. The EWG reviews the investment to determine whether it continues to support mission/user requirements and the Department's strategic direction. The EWG 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, or be retired. The EWG then forwards its recommendations to the IRB.

6.3.8. Make Final Investment Decisions

The IRB approves or disapproves the EWG's 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 IRB to modify, replace, or retire the system.

CHAPTER 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. The steps in Portfolio Management include:

- Defining portfolio goals and objectives
- Understanding, accepting and making tradeoffs
- Identifying, eliminating, and minimizing risks
- Monitoring portfolio performance
- Determining if desired goals and objectives have been obtained

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 if an investment should be continued, modified, 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 agency 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 agency. In addition, DOI will have practical limits on funding, the risks it is willing to take, and the length of time for which it will incur costs on a given investment before benefits are realized. To address these practical limits, portfolio management uses categories to aid in investment comparability and CBSR 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:

- IT investment is selected based on established selection criteria.
- A 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 is based on:

- 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 EXIT CRITERIA

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

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CHAPTER 8—CONCEPTUAL INTEGRATION

8.1 PURPOSE

Conceptually, DOI plans the integrate enterprise architecture, data, and workforce planning with CPIC. This will help direct the business community to make wise IT investments (see Figure 8-1).

The strategic value of the integration is to direct limited resources (both IT and business community) to maximize the transformation of the business enterprise from old industrial age processes to information age business-driven, customer-oriented new ways.

This emerging integration of enterprise architecture, data, and workforce planning with CPIC will ensure subsequent IT Investments will meet the basic concepts of the President's Agenda (e-Gov), ensure DOI is investing in systems and data to accelerate its transformation, and push similar but parallel initiatives together to support management direction. With this integration, the discipline and guidance to determine where DOI will maximize returns on the investment will be synchronized.

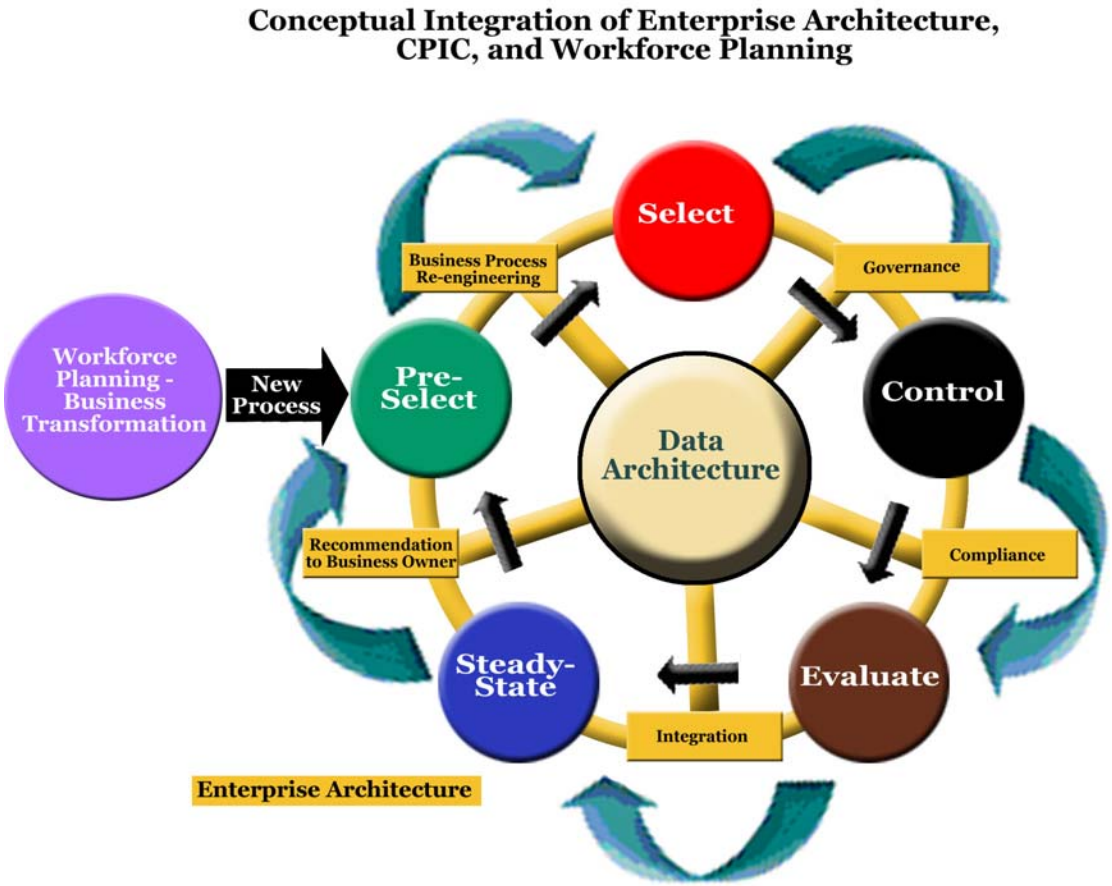

Figure 8-1. Integrating CPIC Phases, EA, Data, and Workforce Planning

IT APPENDICES

United States Department of the Interior Information Technology Management Council ((ITMC)

CHARTER / DOCUMENTATION

August 2002

DEPARTMENT OF THE INTERIOR
INFORMATION TECHNOLOGY
MANAGEMENT COUNCIL
CHARTER

SCOPE

This Charter provides a Resolution that spans the entire Department of the Interior (DOI) Information Technology (IT) and Information Resources Management (IRM) community, establishing a governance structure, chaired by the Department's Chief Information Officer (CIO) with a co-chair elected by the Information Technology Management Council (Council). The Council will report to the Secretary of the Interior and coordinate as needed with the Management Excellence Council (MEC)/ Management Improvement Team (MIT), and will exist until dissolved by the Secretary. The Council will be composed of CIOs from the DOI bureaus and the National Business Center, the Senior Procurement Executive, and ex-officio members. The Council serves as the Executive Capital Planning and Investment Control (CPIC) for IT and reviews and endorses IT and IRM policy. Committees and working groups will be designated, and the membership may include individuals representing Interior business lines and the greater IT community, to participate in varying capacities in this collaborative forum.

OBJECTIVES

The Department's IT investments will be managed through a collaboratively developed ***Interior Enterprise Architecture (IEA)***. These investments will be approved and managed as a function of their contribution to improving Interior-wide core business processes and on priorities identified by the Secretary. The central focus of this Council is to assure development and operation of integrated systems that help the Department and the bureaus meet national and local needs in fulfilling trust responsibilities, and in the management of the lands and natural resources, while supporting the mission and goals outlined in the Department and Bureau Strategic Plans. The Council will promote achievement of the following objectives:

• To provide citizens, our customers, and employees with timely, convenient access (including those with disabilities) to appropriate information and services through the
use of technology.
• To assure that business needs drive IT solutions.
• To evaluate business processes for redesign opportunities before automating them;
use new technologies to make new business methods a reality; and exploit functional commonality across organizational boundaries.
Page 1
• To manage assets as an investment by:
1. Annually allocating funds sufficient to replace systems and equipment before their life-cycle end, and addressing project and infrastructure requirements
through a multi-year planning and funding strategy.
2. Limiting resources dedicated to "legacy systems" (i.e., hardware and software nearing the end of their useful life) to absolutely essential or mandated
changes, and designating systems as "legacy" and scheduling their
replacement. This approach will help focus investments toward the future
rather than the present or past.
3. Investing in education and training to assure the technical staffs in national
and field offices understand and can apply current and future technologies.
• To implement contemporary, but proven, technologies. DOI will stay abreast of emerging trends through an ongoing program of technology evaluation. New
technologies will be introduced through pilot projects where both the automation and
its business benefits and costs can be evaluated prior to bureau-wide adoption or fullscale
deployment occurs.
• To adhere to open (vendor-independent) standards and minimize proprietary solutions. This approach will promote flexibility, interoperability, cost effectiveness, and mitigate the risk of dependence on individual vendors.
• To manage the enterprise network as a fundamental building block of DOI's IT architecture. The bureaus' networks will connect modern workstations and servers; will provide both internal and external connectivity; will be flexible, expandable, and maintainable; and will be fully integrated using open standards and capable of providing for the secure, efficient movement of data, graphics, image, video, and
voice.
• To approach IT undertakings as a partnership between DOI and the bureaus, providing for a combination of centralized and distributed implementation. To
combine the responsibility and knowledge of national and field staff, as well as
outside contract support, within a consistent framework of DOI IT standards. To
establish strategic cooperative arrangements with public and private enterprises to
extend limited resources.
Page 2
• To emphasize the purchase and integration of top quality, Commercial-Off-The-Shelf (COTS) software with minimal customization to speed the delivery of new business applications. This may require redesigning some existing work processes to be compatible with off-the-shelf software packages. To utilize modern, efficient methods and labor-saving tools in a cooperative application development environment. A repository for common information objects (e.g., databases, files, records, methods, application inventories) will be created, shared and reused.
• To capture data once in order to avoid cost, duplication of effort, and potential for

error, and to share the data whenever possible. To establish and use common data and common databases to the fullest extent practicable. A data administration function will be responsible for establishing and enforcing data policy, data sharing and access, data standardization, data quality, identification and consistent use of key corporate identifiers.

• To implement IT systems in adherence with principals of Records Management.

• To implement IT systems in adherence with security, confidentiality and privacy policies to assure proper safeguards and limitations for information availability and access.

• To adopt a total cost of ownership model for IT systems that includes life-cycle considerations like the costs of development, implementation/transition, training, support, disaster recovery, and retirement as well as the impacts of flexibility, scalability, ease of use and reduction of integration complexity.

• To provide assurance that the Department has IT solutions that will aid the Secretary in fulfilling trust responsibilities.

The IEA will identify and document the Department and bureau business work processes and the information needs of these processes. This helps Department and bureau management establish investment strategies for IT based on a comprehensive view of the Department and bureau business needs for IT support and allows the Department and bureaus to direct their efforts into the areas of the greatest benefit. One of the over-riding objectives for the IEA is to reduce the number of bureau-wide automated systems. This will reduce the costs of overhead as well as increase the value of our automation investments to on-the-ground management.

In order to gain the most comprehensive view of the Department and bureaus' business needs, the council will assure the IEA is implemented with the bureaus' Strategic Plans, Budget Process, Capital investment planning, and Work force planning.

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AUTHORITY

The Council is established under the authority of the Clinger-Cohen Act (P.L. 104-106 at 40 U.S.C. Chapter 25), and functions under the provisions of the Office of Management and Budget CIRCULAR A-130, revised. Functional oversight of the Council is provided by the Secretary of the Interior through the MEC. The purpose is to establish the Council as the forum for collaborative governance of IT within the Department. The Council intends to act collaboratively on IT-related matters.

The principal purposes of the Council are:

• To identify and actively manage significant IT-related risks which threaten the integrity and viability of key Departmental missions.

• To review and approve/disapprove all Departmental or bureau cross-cutting system IT investment proposals greater than $5 million total life cycle, all sensitive systems, and all multi-bureau/agency systems; all systems greater than $35 million also require decisions from the MIT and MEC.

• To assure bureaus/offices have an IT investment review process for bureau/office specific IT investments.

• To assure compliance with the Department's architectural requirements.

• To manage the Investment Technology Portfolio for the Department.

• To adopt common approaches throughout the DOI in responding to IT-related issues or requirements.

• To influence the development of Departmental budget requirements involving

activities fulfilling the requirements of the Clinger-Cohen Act of 1996 (Public Law 104-106).

• To assure "best practices" are identified and implemented within the Department.

• To review and approve the Department and bureau/office requests for funding data that involve data collection in accordance with the requirement to adhere to established standards.

• To collaborate with external organizations on government-wide and Presidential initiatives.

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The Council recognizes that deliberate collaboration enables the Department to take advantage of the many common attributes of bureau level IT programs.

The Council will assure that implementation of the Departmental IT agenda occurs in a coordinated fashion that reduces duplication of effort, assures broad compatibility, and enables IT expertise to be shared throughout the Department.

DEFINITIONS

"Information Technology (IT)"

The term "information technology" means any equipment or interconnected system or subsystem of equipment that is used in the automatic acquisition, storage, manipulation, management, movement, control, display, switching, interchange, transmission, or reception of data or information by an executive agency.

"Government Information"

Information created, collected, processed, disseminated, or disposed of by or for the Federal Government.

"Information Resources"

Government information and information technology.

"Information Resources Management"

The process of managing information resources to accomplish agency missions. The term encompasses both information itself and the related resources, such as personnel, equipment, funds, and information technology.

MEMBERSHIP

The Council will be Co-Chaired by the Departmental Chief Information Officer and a rotating Co-Chair elected by the Council annually. Representatives from the following Interior bureaus and offices will participate on the Council as full voting members:

Bureau of Land Management
Office of Surface Mining
Minerals Management Service
Bureau of Reclamation
US Geological Survey
National Park Service
US Fish and Wildlife Service
Bureau of Indian Affairs
National Business Center

The Department's Senior Procurement Executive will participate as a full voting member.

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IT APPENDIX B—CPIC PROCESS CHECKLIST

Pre-Select Phase—What are the business needs for the investments?

The Agency Head identifies a Project Sponsor.

The Project Sponsor/Functional Manager conducts a mission analysis.

The Project Sponsor/Functional Manager develops the investment's concept.

The Project Sponsor/Functional Manager prepares the preliminary business case.

The Project Sponsor/Functional Manager and the Agency Sponsor prepare the Exhibit 300.

The Agency Head reviews and approves the Exhibit 300.

The OCIO and EWG review the initiative and recommend an appropriate action to the IRB.

The IRB makes the final investment decisions.

Select Phase—How do you know you have selected the best investments?

The Project Sponsor/Functional Manager reviews and updates the Mission Needs Statement.

The Agency Head approves IPT membership.

The Project Sponsor identifies the funding source(s) and obtains agency approvals.

The Project Sponsor develops supporting materials for major investments.

The Project Sponsor prepares the investment review submission.

The Agency Head reviews and approves the investment submission.

The OCIO and EWG review the initiative and recommend an appropriate action to the IRB.

The IRB makes the final investment decisions.

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

The Project Sponsor establishes and maintains initiative and security costs, schedule, and technical baselines.

The Project Sponsor maintains current initiative and security costs, schedule, technical, and general status information.

The Project Sponsor, IPT, and Agency Sponsor assess the initiative's progress against performance measures.

The Project Sponsor prepares the annual investment review submission package.

The Agency Head reviews and approves the investment submission.

The OCIO and EWG review the initiative and recommend an appropriate action to the IRB.

The IRB makes final investment decisions.

The OCIO and EWG work with the Project Sponsor to develop solutions to identified issues.

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

The Project Sponsor conducts a PIR and presents results to the OCIO, EWG, and IRB.

The Project Sponsor prepares the annual investment review submission package.

The Agency Head reviews and approves the investment submission.

The OCIO and EWG review and assess the PIR results and recommend an appropriate action to the IRB.

The IRB makes final investment decisions.

The agency, OCIO, EWG and IRB evaluate the IT capital investment management process.

Steady State Phase—Do the investments still cost-effectively support requirements?

The Project Sponsor and the Agency Sponsor analyze the mission.

The Project Sponsor assesses user/customer satisfaction.

The Project Sponsor conducts a technology assessment.

The Project Sponsor and the Agency Sponsor review O&M costs.

The Project Sponsor prepares the annual investment review submission package.

The Agency Head reviews and approves the investment submission.

The OCIO and EWG review the initiative and recommend an appropriate action to the IRB.

The IRB makes final investment decisions.

IT APPENDIX C—MISSION NEEDS STATEMENT

C.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.

C.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 2-1 and Appendix M). It must analytically justify: (1) the need for action to resolve a shortfall in the agency's ability to provide the services needed by its users or customers, or (2) the need to explore a technological opportunity for performing agency missions more effectively. The Mission Needs Statement must be derived from rigorous mission analysis (i.e., 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. Extensive performance analysis should be completed and capability shortfalls should be identified before preparing the Mission Need Statement.

1. Administrative Information

A. MNS Title:	
B. MNS Number:	
C. Originator:	
D. Originator's Organization:	
E. Originator's Phone Number:	
F. Sponsoring Line of Business:	
G. Sponsor's Focal Point:	
H. Sponsor's Focal Point Phone Number:	
I. Submission Date:	
J. Revision Number:	
K. Revision Date:	
Signature:	Agency Head _____ Date _____

2. Impact on DOI Mission Areas

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 agency 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 and the agency strategic plan.

3. 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 (i.e., 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/mission aspects.

4. 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.

5. 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.

6. 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.

7. Benefits

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.

8. 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.

9. 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.

10. 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.

IT APPENDIX D—STEADY-STATE INVESTMENT REVIEW TEMPLATE

D.1 PURPOSE

Investments are reviewed during the Steady-State Phase to ascertain 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. The following section provides a template for the package of materials required for a Steady-State Investment Review. Detailed quantitative and analytical information should be included as attachments.

D.2 STEADY-STATE INVESTMENT REVIEW TEMPLATE

Investment Title—Name/title of investment

Agency—Name of sponsoring agency or activity

1. Administrative Information

A. Date of PIR	Date of the most recent PIR or the date of system deployment/implementation
B. Originator	Name, phone number, and e-mail address of document originator
C. Project Sponsor	Name, phone number, and e-mail address of the Project Sponsor
D. Submission Date	Date of initial document origination
E. Revision Number	Document revision number
F. Revision Date	Date of latest revision
Signature	Agency Head _____ Date _____

2. Introduction/Overview of Existing System

Provide a brief summary of the investment to include mission areas supported, key capabilities, customer/user base, key system or infrastructure interfaces, and dependencies.

3. Mission Analysis

Provide a summary of the mission analysis to determine if the system is continuing to meet mission requirements and needs, and to supports the DOI's evolving strategic direction. This should include a discussion of the mission needs being supported. The mission analysis process identified in the Pre-Select Phase and the Mission Needs Statement (see **Appendix C—Mission Needs Statement**) provides a framework to assist in the mission analysis for the Steady-State Phase.

Include the investment's performance measurement projected baseline and actual performance measurement information to determine if the investment is continuing to provide realizable benefits.

4. User/Customer Assessment

Assess user and customer satisfaction. Include a discussion of results of user/customer surveys, user/customer community inputs, or analysis of usage trends. Supporting documentation, reports, or graphs should be provided as an attachment. Some or all of these activities may be beneficial to

assist in determining continued support for the system, additional user/customer needs, or improvement opportunities.

5. Performance Measures Assessment

Assess investment performance against approved performance measures. Performance data is collected, evaluated, and compared to performance projections made during the Select Phase. The evaluation should indicate needed adjustments to the IT investment or performance measures. Supporting documentation should be provided as an attachment.

6. Technology Assessment

Assess the technology to determine potential opportunities to improve performance, reduce costs, support the DOI enterprise architecture, and ensure alignment with DOI's strategic direction. 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 and provide any back-up data in attachments. References should be made to the existing architecture and asset inventory.

7. Operations & Maintenance (O&M) Cost Analysis

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. Include any supporting graphs and spreadsheets. Costs for government FTEs should be included in all cost estimates and analysis.

8. Recommendations

Describe agency recommended actions—continue in the Steady-State Phase, terminate or dispose of the existing system, or consider new investment alternatives.

IT APPENDIX E—COST-BENEFIT ANALYSIS

E.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 budgetary and political considerations. Possible alternatives include:

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

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.

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

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.

E.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/define objectives
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.

E.2.1. Determine/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.

E.2.2. Document Current Business Process

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

Existing System-Current business processes are performed by manual and/or automated systems. Any proposed investment is 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 Help Desk personnel to support 50 users.

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

System Costs—Current costs provide the CBA baseline. **Figure E-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.

Hardware	Software	Physical Facilities
Manufacturer	Manufacturer	Location
Make/Model/Year	Name	Size
Cost	Version number	Capacity
Power requirements	Year acquired	Structure type
Expected life	License term	Availability
Maintenance requirements	Hardware requirements	Annual cost

Operating characteristics (e.g., size, speed, capacity, etc.) Operating systems supported	Cost (annual or purchase)	

Table E-1. System Architecture Information Requirements

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 E-2. Cost Elements for Systems

E.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 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 cost 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. In a complex situation, more sophisticated tools, such as time-series and regression analysis, may be needed to forecast the future.

E.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.

E.2.5. Choose at Least Three Alternatives

A CBA should present at least three alternatives, with one alternative being to continue with no change. Each viable technical 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.

E.2.6. Document CBA Assumptions

It is mandatory to document all 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.

E.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 (i.e., 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 E-3—**illustrates the cost estimates for an investment initiation activity.

Activties/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 E-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 E-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 E-4. Sample System Lifecycle Cost Estimates

E.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. 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 E-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 E-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 E-6—**and demonstrates using weighting factors makes Alternative 1 the clear winner.

E.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.

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		126	100

Table E-6. Sample Weighted Benefits Score

Table E-7—shows annual costs and benefits for a system lifecycle, along with the discount factor, the discounted costs and benefits (present values), and the discounted net 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, 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 E-7. Sample Discounted Lifecycle Costs and Benefits

E.2.10. Evaluate Alternatives

Many benefits cannot 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 E-8—.**

Alternative	Discounted Cost (DC)	Discounted Benefit (DB)	Discounted Net (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 E-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 Discounted Net (Discounted Benefit minus Discounted Cost). If one alternative clearly has the highest Discounted Net, 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 discounted net 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 Discounted Nets. In **Table E-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 discounted net.

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)	Discounted Net (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 E-9. Sample Investment Comparison (Other Than Lowest Cost System Provides Highest Benefit)

E.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. Some common parameters include:

- 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 E-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

TableE-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.

E.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 E-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	Discounted Net DB - DC	Cumulative Discounted Net
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 E-11. Sample Payback Period

Return on Investment—ROI is often used when comparing proposed investments. Total Discounted Net (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 Discounted Net by the Total Discounted Cost. In the figure above, ROI is the Total Discounted Net ($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 F.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 F—Risk Management** for a more detailed discussion on risk analysis.)

IT APPENDIX F—RISK MANAGEMENT

F.1 PURPOSE

Risk management is an integral part of any capital investment. It includes the processes required to identify, quantify, respond to, and control risks. 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.

F.2 PROCESS

The Risk Management process includes two phases:

Risk assessment involves identifying, analyzing and prioritizing risks; and

Risk response involves developing/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. (i.e., conduct a study/develop a prototype)

Mitigate the specific threat by reducing the expected monetary or schedule impact of the risk, or by reducing the probability of it's 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 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 F-1 provides a means by which risk identification can be easily captured, documented, and analyzed.

Each risk must be:

Described as completely as possible;

Identified by phase/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; and

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, eliminated). The risk management plan will be used to track and communicate risk response activities, their status and their potential impact on the schedule/budget.

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

Table F-1. Example of Risk Management Table

3. Common Areas of Risk

The following common areas of risk are consistent with OMB Circular A-11 risk requirements. There are both mandatory and optional categories or areas of risk that 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/ hardware maturity/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/reviews not planned into the schedule.

Business - Incomplete contracts, market/industry changes, new competitive products become available, creating a monopoly for future procurements.

Organizational and Change Management - Business process re-engineering acceptance by users/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 agency's mission or strategic goals, project is not part of the agency'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

IT APPENDIX G—PERFORMANCE MEASUREMENT

G.1 PURPOSE

Performance measurement is the process whereby an organization establishes the parameters within which 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 agency 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.

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 a Exhibit 300 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

- Measurable/quantifiable
- 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.

G.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 agency'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 or the left most box. What will the system do? What are major functions or features that the system will provide (i.e., what functionality or information)? Is this system a stand-alone system or is it used or integrated with another large 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 the 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, 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. However, incremental improvement is not necessarily

success. The targeted improvement from the baseline must be achieved within the designated timeframe to be counted as a success.

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 the measures the right ones to use?

- Are measures targeted to a clear outcome (results rather than inputs or outputs)?
- Are measures linked to a specific and critical organizational process?
- 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 consistent with individual motivations?
- 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?

IT APPENDIX H—PROJECT MANAGEMENT

H.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 (i.e., users, customers, and senior leaders). Perhaps the greatest project management challenge is identifying risks and then executing management techniques that mitigate the risks to ensure timely and successful completion.

H.2 COMPONENTS

Project Managers should complete the following project management components to help ensure the investment's successful completion:

Project Planning—Project planning is a critical element of every successful investment. It provides a foundation on which to base anticipated efforts. Additionally, it helps identify investment components and illustrates these components in a project plan. Project planning includes:

- Charter development
- Scope definition
- Activity identification
- Activity duration estimation
- Activity sequencing
- Cost estimation
- Schedule development
- Project staffing/resourcing
- Project plan development.

Investments typically involve multiple components that may be complex or interface with other proposed/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/stage 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 H-1—**provides an example of a WBS.

Scope Management—The scope frames what is expected of the investment's ultimate capability and functionality. As such, 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" 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/quality. The risk management plan is continually updated throughout the investment's lifecycle and is part of periodic reviews. **Appendix**

F— 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 continuously 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 I—Earned Value Analysis**).

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
MPMP1	Milestone PMP1

Table H-1. Example of a Project Planning WBS Activities during the Select Phase

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**

G—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 J—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/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.

IT APPENDIX I—EARNED VALUE ANALYSIS

I.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 template (June 28, 2002 version). 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 sum of the plan costs, sum of the value of work performed, and sum of the actual work performed as of a reference date. These 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 in order to 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.

I.2 PROCESS

Before completing earned value analysis, the Project Manager needs to complete the following project management tasks (see **Appendix H—Project Management**):

- 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/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 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.

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

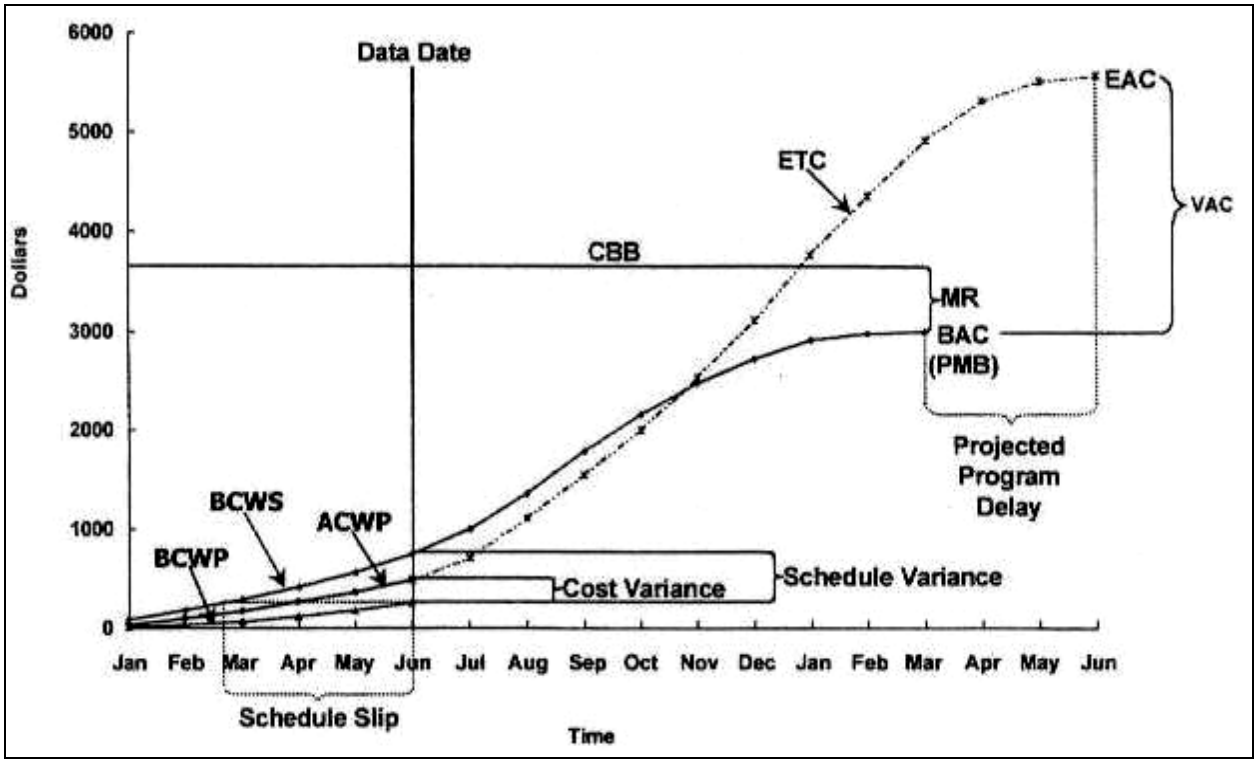


Figure I-1. Sample Earned Value Analysis Chart

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. 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.

IT APPENDIX J—POST-IMPLEMENTATION REVIEWS

J.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.

A team of agency and/or staff office personnel should conduct the PIR. However, in order to ensure the review is conducted independently and objectively, the PIR 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/user satisfaction with the end product, mission/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.

J.2 PROCESS

There are seven major steps to conducting a PIR:

1. Initiate PIR

The review team initiates a PIR by preparing and sending a memorandum to the Project Sponsor 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 all 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 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/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 includes 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.

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. Issue Report

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

8. Findings and Recommendation Report

The OCIO, project manager and agency 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.

IT APPENDIX K—STRATEGIC INVESTMENT CRITERIA AND BONUS POINT EVALUATION TOOLS

The following pages provide a general framework that suggests a process flow during the annual investment review cycle. This serves as a model for reference and consideration in developing the framework within the FY 2005 and future budget processes. It outlines specific materials that would be reviewed, evaluation factors, and rating award basis for project components supplementing Appendix K in the overall manual guidance. The following chart indicates which factors are rated in the five stages:

Investment Criteria Applicable in Each Phase					
Criteria	Pre-Select	Select	Control	Evaluate	Steady-State
Mission	X	X			X
Risk		X	X		
ROI		X			
Cost			X	X	X
Schedule			X		
Performance			X	X	X
Post-Implementation Review				X	
Security		X	X	X	X
Enterprise Architecture	X	X	X	X	X
eGovernment	X	X	X	X	X
Telecommunications	X	X	X	X	X
Secretarial/Administration Priority	X	X	X		

Figure K-1. Investment Criteria Applicable in Each Phase

EVALUATION OF MISSION

Objective: Maximize the relationship between the investment and the mission.

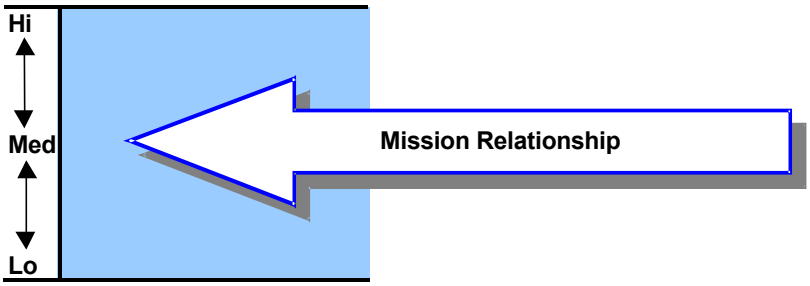


Figure K-2. Mission Relationship

Review the Following Materials Related to Mission and Performance Measures

- Agency Mission Needs Statement
- Statement of Project/System Purpose and Business Case
- Strategic Plan Goals/Strategic Plan Performance Measures and Indicators
- Results of I-TIPS Scoring

Mission Evaluation Factors

How does the investment support or influence mission effectiveness?

Do the performance measures reflect the effectiveness of the investment to achieve mission goals?

Rating Award Basis

5	Award this rating if there is a direct and influential relationship between the investment and the mission, and if the performance measures reflect the ability to directly affect and influence the achievement of mission goals.
4	Award this rating if there is an indirect or support relationship between the investment and the mission, and if the performance measures reflect an indirect ability to positively affect and influence mission goals.
3	Award this rating if there is a direct and influential relationship between the investment and the mission, but the performance measures are not developed well enough to determine how the investment would contribute to the achievement of mission goals.
2	Award this rating if there is an indirect or support relationship between the investment and the mission, but the performance measures are not developed well enough to determine how the investment would contribute to the achievement of mission goals.
1	Award this rating if the relationship between the investment and the mission is not clear, or if there are no developed performance measures.

Figure K-3. Rating Award Basis

EVALUATION OF RISK

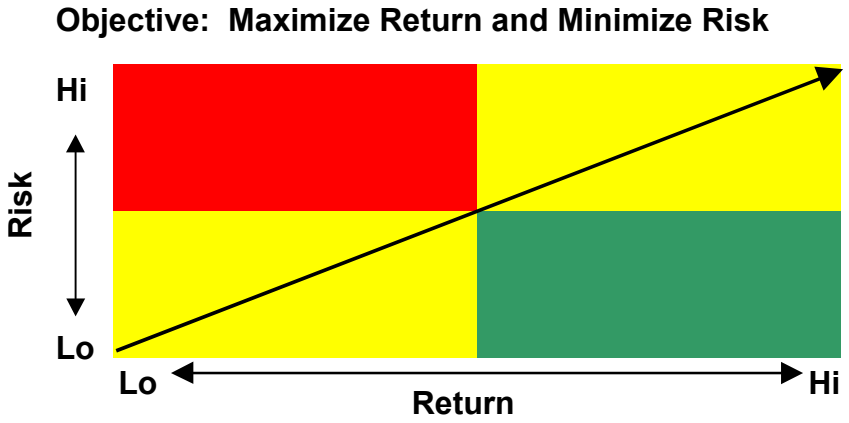


Figure K-4. Risk Objective

Examples of Different Types of Risk

Project Costs, Size, or Resource Requirements

Organization/Project Management

Strategic/Business Impact

Security

Management

Economic/Financial

Technical

Contract/Acquisition

Implementation

Change Management

Human Element

Risk Evaluation Factors

Is there a comprehensive Risk Management Plan in place?

Are the appropriate risks identified, quantified, evaluated, and mitigated?

Rating Award Basis

5	Award this rating if there is a comprehensive Risk Management Plan in place, and all the appropriate risks are identified, quantified, evaluated, and mitigated.
4	Award this rating if there is a Risk Management Plan in place, but not all of the risks are identified, and the omissions are minor, and the risk mitigation strategies address the critical areas.
3	Award this rating if there is a Risk Management Plan in place, but not all of the risks are identified, and some of the mitigation strategies are suspect.
2	Award this rating if only token attention has been paid to risk, or if the Risk Management Plan is poorly developed.
1	Award this rating if there is no Risk Management Plan in place.

Figure K-5. Rating Award Basis

EVALUATION OF RETURN ON INVESTMENT (ROI)

Objective: Maximize the Return, Minimize the Investment Cost

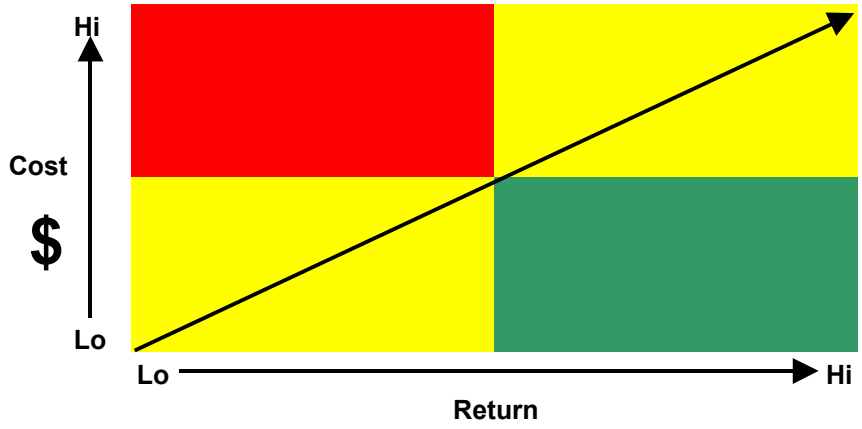


Figure K-6. ROI Objective

Examples of Return-on-Investment Measures

- Benefit/Cost Analysis
- Return on Investment (ROI) Calculations
- Non-quantitative Benefits (intangibles)
- Discounted Simple Return-On-Investment
- Net Present Value (NPV)
- Internal Rate of Return
- Discounted Payback Period

Return on Investment Evaluation Factors

Has the agency addressed and computed all the quantitative and non-quantitative measures to determine its overall return-on-investment?

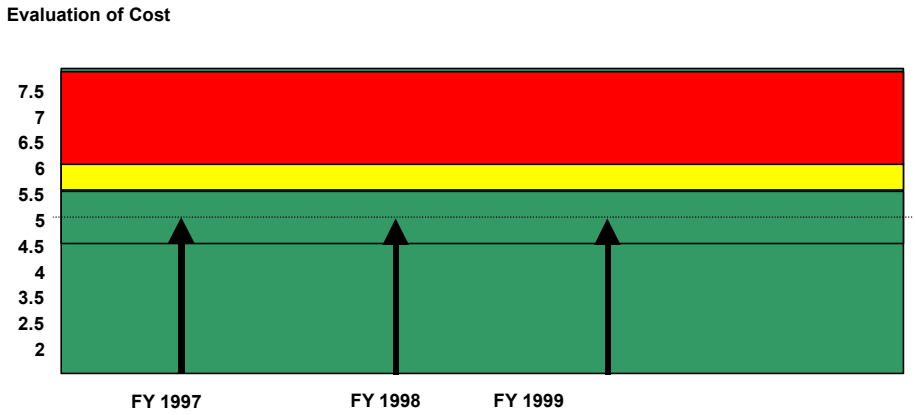
Do the measures used indicate that the investment will provide a justifiable return-on-investment relative to the investment level?

Rating Award Basis

5	Award this rating if all the ROI measures were addressed and computed, and if they indicate a potential high.
4	Award this rating if most of the ROI measures were addressed, and if they indicate a potential good return on investment.
3	Award this rating if some ROI measures were used, and if they indicate a potential reasonable return on investment.
2	Award this rating if few or no ROI measures were used, or if they indicate a potential poor return on investment.
1	Award this rating if no ROI measures were prepared.

Figure K-7. Rating Award Basis

EVALUATION OF COST



In the example to the left, assume a baseline funding level of $5.0 million for FY 1997, 1998, and 1999. With good cost control discipline, these costs could be controlled within a variance of +/-10 percent of this level, or between $4.5 and $5.5 million. A 20 percent variance would be between $4.0 and $6.0 million.

Figure K-8. Cost Evaluation

Cost-Control Considerations

Cost baseline budget estimates or projections.

Revised cost estimates

Actual expenditure history and variance.

Management actions based on actual versus projected cost experience.

Cost-Evaluation Factors

How well are budgeted and actual costs accounted for, controlled, and managed?

Are cost variances computed? Are they used to monitor how well the investment is proceeding relative to its cost estimates? Are they used as a management tool?

Rating Award Basis

5	Award this rating if costs are appropriately accounted for, controlled, and managed, and if the original cost estimate has been met.
4	Award this rating if costs are appropriately accounted for, controlled, and managed, and if the cost variance is within 10 percent cost variance of the original estimates.
3	Award this rating if costs are appropriately accounted for, controlled, and managed, and if the cost variance is within 20 percent of the original estimates.
2	Award this rating if costs are not appropriately accounted for, controlled, and managed, or if the cost variance is beyond 25 percent of the original estimate.
1	Award this rating if costs are not appropriately accounted for, controlled, and managed, or if cost variance are not calculated, or if costs are beyond 50 percent of the original estimates.

Figure K-9. Rating Award Basis

EVALUATION OF SCHEDULE

Objective: Deploy and deliver the initiative on time.

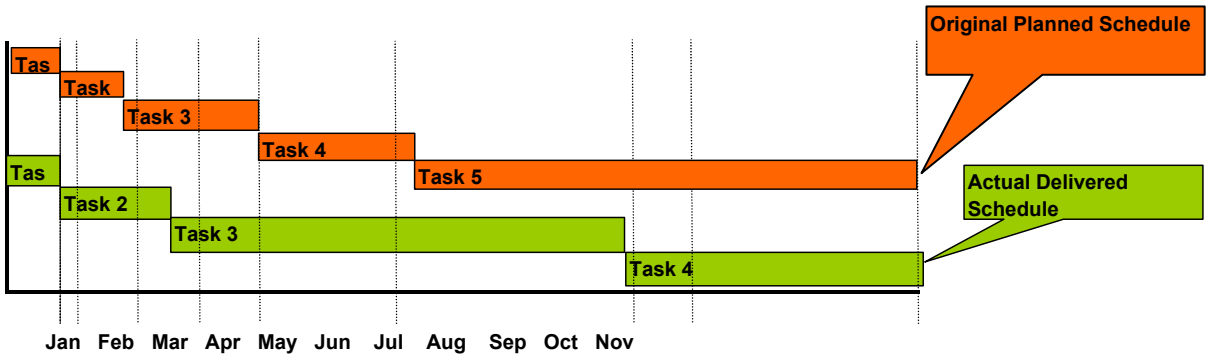


Figure K-10. Schedule Objective

Review the Following Materials

Baseline project plans, timelines, milestone, or Gantt charts

Actual historical experience relative to the schedule for deployment implementation and for operation

Strategic and/or tactical plans

Record of management actions taken

Schedule Evaluation Factors

How well has the deployment of the initiative adhered to its original project schedule?

Are schedule slippages being properly managed?

Rating Award Basis

5	Award this rating if the original schedule has been met.
4	Award this rating if the original schedule has been closely adhered to and any schedule slippages are within 10 percent of original baseline.
3	Award this rating if the project is within 20 percent of the original schedule and any schedule slippages have been properly managed.
2	Award this rating if the project is delayed more than 20 percent, but less than 50 percent of the original schedule, or if schedule slippages have not been properly managed.
1	Award this rating if the project is delayed beyond 50 percent of the original schedule or if schedule slippages have not been properly managed.

Figure K-11. Rating Award Basis

EVALUATION OF PERFORMANCE

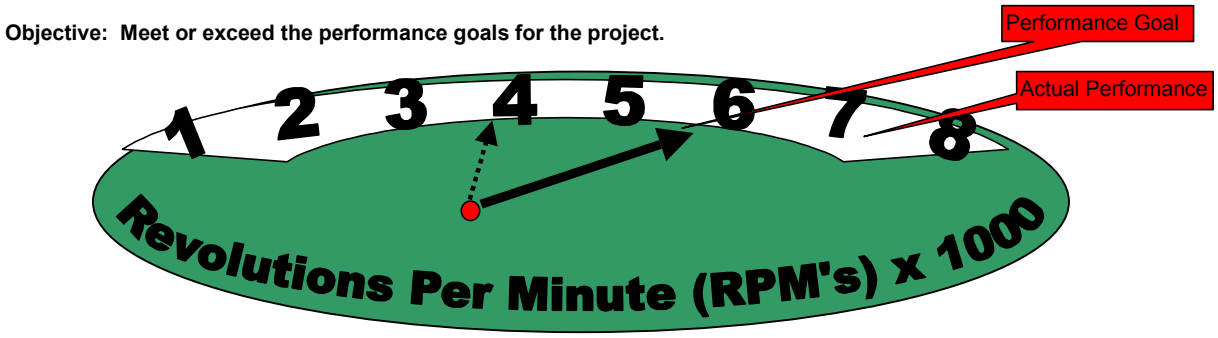


Figure K-12. Performance Objective

Performance Considerations

Original baseline performance design goals

Performance measures, indicators, or other metrics

Reports on progress toward meeting original baseline design goals or performance measures or indicators

Performance Evaluation Factors

How well has the agency done in identifying original baseline goals?

How well has the agency done in identifying performance measures and indicators?

How well has the agency done in reporting progress in attaining its baseline goals or attaining its targets for performance measures and indicators?

How meaningful are the identified baseline performance goals and the performance measures and indicators in measuring the "value" of the investment to the supported program?

Rating Award Basis

5	Award this rating if the agency has done a commendable job at identifying both original baseline performance goals and performance measures and indicators, and the reports indicate full attainment of the original performance goals and their related performance measures and indicators.
4	Award this rating if the agency has done a commendable job at identifying both baseline performance goals and performance measures and indicators, and reports achieving within 10 percent of the original design goals/measures/indicators.
3	Award this rating if the agency has done a fair job at identifying baseline performance goals and performance measures and indicators, and percent reports achieving within 20 percent of the original design goals/measures/indicators.
2	Award this rating if the agency has done a fair job at identifying baseline performance goals, but the performance measures and indicators are lacking in specificity, and progress toward these goals/measures/indicators is not well tracked.
1	Award this rating if the agency has done a poor job at identifying either baseline performance goals or performance measures and indicators, or if unsatisfactory progress has been made toward achieving those goals and measures, or if they are not appropriately tracked.

Figure K-13. Rating Award Basis

EVALUATION OF POST-IMPLEMENTATION REVIEWS

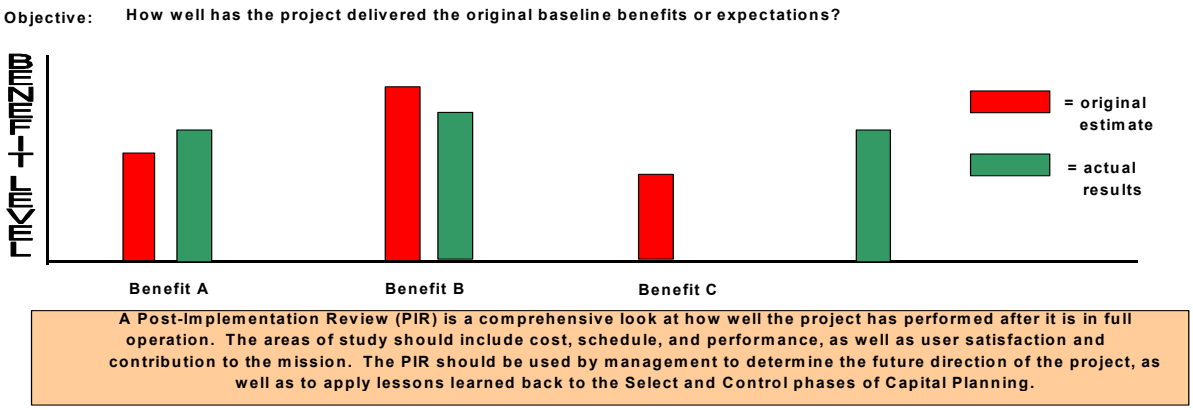


Figure K-14. Post-Implementation Review Objectives

Post-Implementation Review Considerations

Post-Implementation-Review (PIR) documents

Management actions based on PIR activities

Post-Implementation Review Evaluation Factors

How has the agency done at conducting post-implementation reviews and documenting the progress toward achieving the original goals, benefits, and expectations?

How well has management done at using the results of those reviews as the basis for taking the appropriate management action on the investment and the investment process?

Rating Award Basis

5	Award this rating if the agency has done a commendable job at conducting PIRs and if those reviews report attainment of the goals, benefits, and expectations originally envisioned for the project, those reviews have been used by management to assess the project and the process, and the agency has taken appropriate actions.
4	Award this rating if the agency has done a commendable job at conducting PIRs and if those reviews report attainment of the majority of the goals, benefits, and expectations originally envisioned for the project, and those reviews have been used by management to assess the project and take appropriate actions on the investment and the investment process.
3	Award this rating if the agency has done a fair job at conducting PIRs, and if the reviews results were used to determine appropriate changes to the investment.
2	Award this rating if the agency has made some effort to conduct PIRs, but the results do not clearly indicate progress toward attainment of goals, benefits, and expectations, or they were not used to manage the investment.
1	Award this rating if the agency has not conducted PIRs.

Figure K-15. Rating Award Basis

EVALUATION OF SECURITY

Objective: To protect the availability, confidentiality and integrity of system assets by maximizing security safeguards and performance, while controlling security costs.

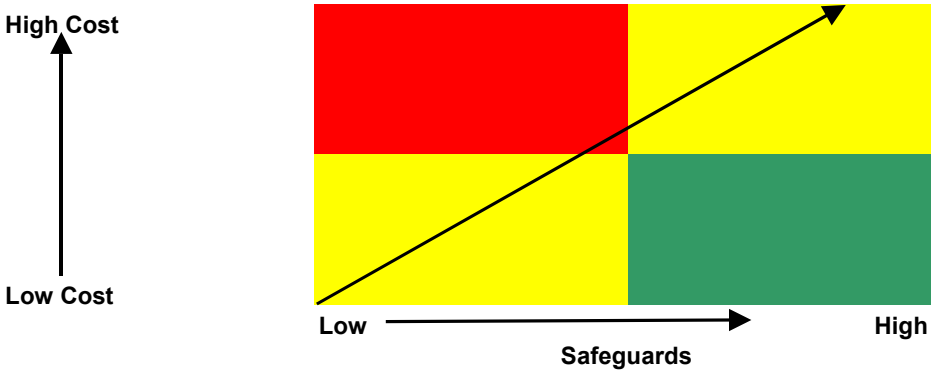


Figure K-16. Security Objective

Elements of Security Protection

Select Phase:	Security Analysis Risk Management/Mitigation
Control Phase:	Security Cost Performance Goals
Evaluation and Steady-State Phases:	Post-Implementation Security Reviews

Figure K-17. Elements of Security Protection

Security Evaluation Factors

Select Phase:	Has a comprehensive security analysis been conducted? Are security risks identified and mitigation strategies proposed?
Control Phase:	Have estimated security costs been compared to actual costs? Are the estimated and actual costs in line? Have security goals and measures been established and met?
Evaluation and Steady-State Phases:	Is the system security functioning as anticipated? Are additional security countermeasures needed to protect assets?

Figure K-18. Security Evaluation Factors

Rating Award Basis

Select Phase

5	Comprehensive security analysis done, appropriate risks identified, mitigation strategies sound, security cost accurate, and security complements departmental architecture.
4	Comprehensive security analysis done, appropriate risks identified, mitigation strategies sound, security cost accurate, and security complements departmental architecture.
3	Comprehensive security analysis done with minor omissions, most but not all risks identified, some mitigation strategies suspect, security costs accurate, security complements departmental architecture.
2	Security analysis has been done with major omissions, risk management/mitigation strategies inadequate, cost data is incomplete, and security does not complement departmental architecture.
1	Security analysis has not been done, risks and mitigation strategies are not identified, cost data not accurate, security does not complement departmental architecture.

Figure K-19. Rating Award Basis—Select Phase

Rating Award Basis

Control Phase

5	Security costs are appropriately accounted for, controlled, and managed; original cost estimate is accurate; detailed performance goals/measures established.
4	Security costs are appropriately accounted for, controlled, and managed; cost variance is within 10 percent of original estimates; detailed performance goals/measures established.
3	Security costs are appropriately accounted for, controlled, and managed; cost variance is within 20 percent of original estimates; reasonable performance goals/measures established.
2	Security costs are not appropriately accounted for, controlled, or managed and cost variance is beyond 25 percent of original estimates; reasonable performance goals/measures have been established.
1	Security costs are not appropriately accounted for, controlled, or managed, and cost variance is beyond 50 percent of original estimates; reasonable performance goals/measures have not been established.

Figure K-20. Rating Award Basis—Control Phase

Rating Award Basis

Evaluation and Steady-State Phases

5	Agency has done a commendable job in conducting post-implementation security reviews; results confirm attainment of the goals, benefits, and expectations for the project.

4	Agency has done a commendable job in conducting post-implementation security reviews; results were used to determine appropriate changes to investment process and to take remedial actions on project.
3	Agency has done an average job in conducting post-implementation security reviews; results were used to assess the desired goals/benefits/expectations of project, changes in the investment process, and remedial actions taken on the project.
2	Agency has made some effort to conduct post-implementation security reviews; results have not had sufficient impact on the project or investment process.
1	Agency has not performed any post -implementation security reviews, or results were not documented and have not had sufficient impact on the project or investment process.

Figure K-21. Rating Award Basis—Evaluation and Steady-State Phases

EVALUATION OF ENTERPRISE ARCHITECTURE

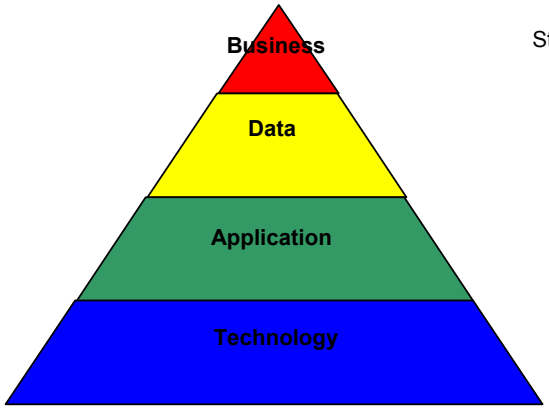


Figure K-22. Evaluation and Steady-State Phases

Review the following materials:

DOI Enterprise Architecture Plan (http://www.ocio.DOI.gov/irm/e_arch/index.html)

CIO Council's *Practical Guide to Federal Enterprise Architecture* (http://www.itpolicy.gsa.gov/mke/archplus/ea_guide.doc)

List of enterprise-wide IT acquisition contracts (http://www.hqnet.DOI.gov/ocio/it_leadership/e_arch/ent_acq_projs.doc)

The sponsoring agency's enterprise architecture and associated documents (if available).

EA Evaluation Factors

Does the agency have:

- an agency-level ("component") enterprise architecture (EA)? If so, is the investment integrated with the agency's EA?
- an EA plan and/or EA policies?
- a chief architect and/or an EA governing board?
- a defined overall EA approach or framework?
- an automated EA tool in use?

If an EA has been developed, is there a credible migration plan (for data, applications, and legacy system phase-out) from the existing ("as-is") to the proposed ("to-be") environment?

Could, or has, the investment taken advantage of the enterprise-wide IT acquisition contracts?

Does the investment have eGovernment, information security, standardized procurement, or wide area telecommunication elements? If so, is the investment integrated with DOI's eGov, info security, standardized procurement, or telecommunication plans and standards?

Does the investment have interagency elements? Has the investment been integrated with the EA(s) of interfacing agencies or mission areas?

Are detailed management plans in place describing how this investment will be supported, maintained, and refreshed to ensure its currency and continued effectiveness, including a training and awareness plan for users and technical staff?

Are asset management processes in place to inventory and manage this new asset (investment) from a property management perspective, to provide configuration management support, and to monitor system performance?

Rating Award Basis (for all phases)

	Award this score if the preponderance of evidence indicates that:
5	The sponsoring agency has all the EA foundation elements mentioned below in place and has both fully defined "as-is" (baseline) and "to-be" architectures in place. These architectures include business, data, application and technology elements, and a sequencing plan has been developed. This investment aligns with the agency's EA. The investment's managers have determined there are opportunities for cooperation with interfacing agencies or mission areas and have taken advantage of all applicable opportunities. The investment's managers have determined there are alignment requirements with Departmental eGov, telecommunications, standardized procurement, and/or IT security initiatives and are fully aligned with these requirements. The investment's managers have determined there are opportunities to take advantage of enterprise-wide IT acquisition contracts and have completely done so.

Figure K-23. Rating Award Basis—All Phases (Page 1 of 3)

4	Award this score if the preponderance of evidence indicates that: The sponsoring agency has all the EA foundation elements mentioned below in place and has fully defined either an "as-is" (baseline) or "to-be" EA that include business, data, application, and technology elements. This investment aligns with the agency's EA. The investment's managers have determined there are opportunities for cooperation with interfacing agencies or mission areas and have made significant progress in doing so. The investment's managers have determined there are alignment requirements with Departmental eGov, telecommunications, standardized procurement, and/or IT security initiatives and have made significant progress in addressing these requirements. The investment's managers have determined there are opportunities to take advantage of enterprise-wide IT acquisition contracts and have made significant progress in doing so.
3	Award this score if the preponderance of evidence indicates that: The sponsoring agency has all the EA foundation elements in place in that: it has a governance mechanism in place (e.g., Chief Architect or EA board), an EA policy has been developed or is under development, it has an EA framework or approach, it is using an automated tool, and it has created an EA development plan. However, neither an "as-is" (baseline) nor "to-be" EA including business, data, application, and technology elements has yet been fully defined. The investment's managers have determined there are opportunities for cooperation with interfacing agencies or mission areas and have made some progress in doing so. The investment's managers have determined there are alignment requirements with Departmental eGov, telecommunications, standardized procurement, and/or IT security initiatives and have made some progress in addressing these requirements. The investment's managers have determined there are opportunities to take advantage of enterprise-wide IT acquisition contracts and have made some progress in doing so.
2	Award this score if the preponderance of evidence indicates that: The sponsoring agency has some EA foundation elements in place (i.e., a Chief Architect has been designated or an EA policy has been developed). Additionally, pieces of a baseline ("as-is") EA that includes business, data, application, and technology elements have been partially defined. The investment's managers have determined there are opportunities for cooperation with interfacing agencies or mission areas, but have made no progress in doing so. The investment's managers have determined that there are alignment requirements with Departmental eGov, telecommunications, standardized procurement, and/or IT security initiatives, but have made no progress in addressing these requirements. The investment's managers have determined there are opportunities to take advantage of enterprise-wide IT acquisition contracts, but have made no progress in doing so.

Figure K-23. Rating Award Basis—All Phases (Page 2 of 3)

1	Award this score if the preponderance of evidence indicates that: The sponsoring agency has not developed any portions of its component EA. The investment's managers have made no effort to determine whether there are opportunities for cooperation with interfacing agencies or mission areas. The investment's managers have made no effort to determine potential alignment with Departmental eGov, telecommunications, standardized procurement, or IT security initiatives. The investment's managers have made no effort to review ongoing enterprise-wide IT acquisition contracts.

Figure K-23. Rating Award Basis—All Phases (Page 3 of 3)

EVALUATION OF EGOVERNMENT

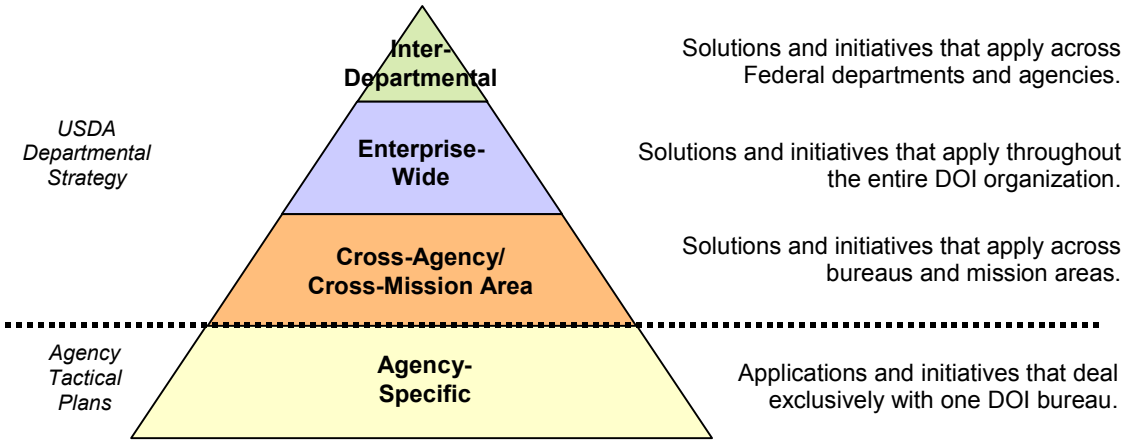


Figure K-24. Evaluation of EGovernment

Review the following materials for eGovernment:

- Strategic plan
- Tactical plan
- Business case

eGovernment Considerations

- Agency-led initiatives should support and enable the Department's eGovernment strategic goals and objectives.
- Initiative should reduce cost and/or increase efficiency and effectiveness.
- Does the investment provide for increased customer-centered government?
- Does the investment consider collaboration efforts (i.e., support one or multiple agencies, leverage exiting or proposed investments, etc.)?
- Does the investment consider the architecture and security requirements?
- Consider the agency's Government Paperwork Elimination Act of 1998 (GPEA) transactions.
- Major systems investment should be designed to address program delivery using the electronic approaches and solutions afforded by the information age.
- Metrics should be developed to measure use of and satisfaction with the electronic delivery channel.
- Systems must be viewed with the objective of unifying, (i.e., eliminating redundancy), and simplifying systems development and information and data collection efforts.
- Information collections must be identified for systems that impact the public.
- Identify which records are being used and produced by the system.

eGovernment Evaluation Factors

Pre-Select/Select

- How much consideration has the agency given to eGovernment?
- Does this investment follow the eGovernment strategic plan?
- What documentation/evidence has been provided?
- How much focus is on customer requirements?
- Should it be eGov?

Control

- Are Change of Requirements/Design meeting Government objectives?

Has additional Governmental need for the investment been identified?

Has technological capability increased?

Have customer service requirements been identified?

Evaluate/Steady-State

Could it be eGov?

Goals/objectives?

Detailed plans?

Is new initiative coming out that could replace and cover eGov?

If the system is eGov, are customers using and satisfied with the system?

Rating Award Basis

Pre-Select/Select

5	Award this rating if eGov strategic goals and objectives have been met, the agency tactical plan is complete, a comprehensive analysis has been done, and supporting documentation/evidence is complete.
4	Award this rating if eGov strategic goals and objectives have been met, the agency tactical plan is nearly complete with any outstanding issues documented, a comprehensive analysis has been done, and supporting documentation/evidence is complete.
3	Award this rating if eGov strategic goals and objectives have been reasonably met, the agency tactical plan is under development, an analysis is in process, and some of the documentation is complete.
2	Award this rating if eGov strategic goals and objectives have been considered, the agency tactical plan is under development, an analysis has been started, and limited documentation is available.
1	Award this rating if eGov strategic goals and objectives have not been considered, the agency tactical plan has not been started, an analysis is in process, and some of the documentation is available.

Figure K-25. Rating Award Basis—Pre-Select/Select

Control

5	Award this rating if eGov initiative exceeded customer service requirements, thoroughly assessed all interagency eGov initiatives, and fully aligned with the agency's Enterprise Architecture, Strategic and Tactical Plans.
4	Award this rating if eGov initiative met customer service requirements, assessed all interagency eGov initiatives, and fully aligned with the agency's Enterprise Architecture, Strategic and Tactical Plans.
3	Award this rating if eGov initiative met customer service requirements, assessed some interagency eGov initiatives, and aligned with the agency's Enterprise Architecture Strategic and Tactical Plans.
2	Award this rating if eGov initiative marginally met customer service requirements, considered some interagency eGov initiatives, and loosely aligned with the agency's Enterprise Architecture Strategic and Tactical Plans.
1	Award this rating if eGov initiative failed to meet customer service expectations, failed to consider interagency eGov initiatives, and was not aligned with the agency's Enterprise Architecture, Strategic and Tactical Plans.

Figure K-26. Rating Award Basis—Control

Evaluate/Steady State

5	Award this rating if eGov initiative exceeded customer service expectations, proactively addressed all technology refresh options, and fully aligned with the agency's Enterprise Architecture, Strategic and Tactical Plans.
4	Award this rating if eGov initiative met customer service expectations, proactively addressed all technology refresh options, and fully aligned with the agency's Enterprise Architecture, Strategic and Tactical Plans.
3	Award this rating if eGov initiative met customer service expectations, addressed some technology refresh options, and aligned with the agency's Enterprise Architecture Strategic and Tactical Plans.
2	Award this rating if eGov initiative marginally met customer service expectations, reactively addressed some technology refresh options, and loosely aligned with the agency's Enterprise Architecture Strategic and Tactical Plans.
1	Award this rating if eGov initiative failed to meet customer service expectations, failed to address technology refresh options, and was not aligned with the agency's Enterprise Architecture, Strategic and Tactical Plans.

Figure K-27. Rating Award Basis—Evaluate/Steady State

EVALUATION OF TELECOMMUNICATIONS TECHNOLOGIES AND SERVICES

Objective: To serve as a basis for the evaluation of telecommunications planning, design, acquisition, installation/integration, operations, and maintenance tasks for information technology, electronic government and telecommunications capital projects. Recommendations on how to perform the specific tasks presented in each phase can be found in the CPIC Guide, main document, and in the Telecommunications Reference Manual.

Elements of Telecommunications Integration and Support

Pre-Select Phase:	Gap Analysis Rough-order-of-magnitude (ROM) Lifecycle Cost Estimate (acquisition, design and development, installation, operations and maintenance)
Select Phase:	Telecommunications Infrastructure Analysis Cost Estimate Agency Telecommunications Plan
Control Phase:	Review Cost Estimate System/Service Performance Goals/Measures
Evaluation and Steady-State Phases:	Post-Implementation Reviews of Telecommunications Infrastructure

Figure K-28. Elements of Telecommunications Integration and Support

Telecommunications Evaluation Factors

Pre-Select Phase:	What is the scope of anticipated telecommunications requirements for the project? What changes to the current telecommunications capability do you anticipate in order to meet operational requirements? What obstacles might prevent the organization from meeting existing or anticipated business or technical requirements for telecommunications support? What is the current budget for telecommunications? What is the anticipated budget for telecommunications? Based on a preliminary assessment of costs for anticipated telecommunications requirements, are ROM Lifecycle costs feasible when considering the return on investment (ROI)?
Select Phase:	Has a comprehensive telecommunications analysis been conducted? Resource sharing explored? Has a supportable cost estimate and agency telecommunications plan been prepared for the system/service?
Control Phase:	Have estimated original cost estimates been compared to actual costs? Have goals and measures been established for this system/service?

Evaluation and Steady-State Phases:	Is the system telecommunications infrastructure functioning as anticipated? What are the lessons learned for replacement/upgrade systems?

Figure K-29. Telecommunications Evaluation Factors

Rating Award Basis

Pre-Select Phase

5	Documentation is thorough and complete. Sound assumptions are made.
4	Documentation is complete. Reasonable assumptions are made.
3	Documentation is complete. Assumptions are questionable.
2	Documentation is incomplete. Assumptions are questionable.
1	Documentation is incomplete. Assumptions are unrealistic.

Figure K-30. Rating Award Basis—Pre-Select Phase

Select Phase

5	Comprehensive telecommunications analysis done, cost estimates reasonable, resource sharing explored, and an Agency Telecommunication Plan prepared.
4	Comprehensive telecommunications analysis done, supported cost estimate provided, resource sharing explored, and an Agency Telecommunications Plan prepared.
3	Comprehensive telecommunications analysis done with minor omissions, cost estimate provided, resource sharing explored, and an Agency Telecommunications Plan prepared.
2	Comprehensive telecommunications analysis done with major omissions, cost estimate incomplete, resource sharing not explored, but an Agency Telecommunications Plan prepared.
1	Comprehensive telecommunications analysis not done, cost estimate not included, resource sharing not explored, and an Agency Telecommunications Plan not prepared.

Figure K-31. Rating Award Basis—Select Phase

Control Phase

5	Telecommunications costs are appropriately accounted for, controlled, and managed; original cost estimate is accurate; system/service performance goals/measures established.
4	Telecommunications costs are appropriately accounted for, controlled, and managed; original cost variance is within 10 percent of original estimate; and system/service performance goals/measures established.
3	Telecommunications costs are appropriately accounted for, controlled, and managed; cost variance is within 20 percent of original estimates; system/service performance goals/measures established.
2	Telecommunications costs are not appropriately accounted for, controlled, and managed; cost variance is within 25 percent of original estimates; system/service performance goals/measures established.

1	Telecommunications costs are not appropriately accounted for, controlled, and managed; cost variance is within 25 percent of original estimates; system/service performance goals/measures not established.

Figure K-32. Rating Award Basis—Control Phase

Evaluation and Steady-State Phases

5	Agency has done a commendable job in conducting post-implementation reviews of the telecommunications infrastructure; results confirm attainment of the goals/measures for the project.
4	Agency has done a commendable job in conducting post-implementation reviews of the telecommunications infrastructure; results were used to determine appropriate changes to the investment process and take remedial actions on this project.
3	Agency has done an average job in conducting post-implementation reviews of the telecommunications infrastructure with minor omissions; results were used to assess desired benefits for this project, make changes in the investment process, and take remedial actions to maximize benefits.
2	Agency has made some effort to conduct post-implementation reviews of the telecommunications infrastructure with major omissions; results have not had sufficient impact on the project or investment process.
1	Agency has not performed any post-implementation reviews of the telecommunications infrastructure, or results were not documented and have not had sufficient impact on the project or investment process.

Figure K-33. Rating Award Basis— Evaluation and Steady-State Phases

Further consideration of projects that directly support priority initiatives of the Secretary or Administration may also be acknowledged in this process.

Furthermore, policy statements of the Secretary, Assistant Secretaries, or Department/Administration budget priorities may also be considered in this process.

IT APPENDIX L—E-GOVERNMENT

L.1 PURPOSE

"Expanding Electronic Government" (E-Government) is one of the five key elements of the President's Management Agenda. The goals of the Administration's E-Government Strategy are to:

- Create single points of access for government services
- Reduce reporting requirements
- Share information more effectively with State, local, and Tribal governments
- Automate internal processes to reduce costs

E-Government is enabled by a wide range of electronic, multimedia and digital solutions, such as
the Internet, personal digital assistants, call centers, handheld wireless devices, machine-to-machine devices (i.e., Smart Tags) and kiosks.

L.2 E-GOVERNMENT AT INTERIOR

In support of the President's Management Agenda and Interior's desire to transform and enhance the delivery of the Department's programs, services, and information, Interior is developing a strategic framework for meeting the challenges and opportunities of service delivery in an E-Government environment.

Interior is developing an E-Government vision of making information, services, and programs available any place, at any time. To meet this vision, the Department is using an enterprise approach to delivering information, services, and programs. It also addresses the Office of Management and Budget's (OMB) requirements to fully integrate the business, information management and IT planning processes. At the highest level, Interior IT investments should demonstrate the following:

Collaborative and Blended Ventures vs. Single Agency Approaches

Requiring new problem-solving perspectives

Leveraging existing agency expertise for interdepartmental and cross-mission area benefit

Foregoing single agency initiatives that are not integrated with Government-wide or Departmental E-Government strategies

Expands the number of agencies involved

Expands the functionality provided

Pools funds to support enterprise approaches and acquisitions beginning in fiscal year 2002.

Customer-Centered Government

Improves customer service;

Connects the Federal Government with its citizens

Assesses customer demand and readiness and projects expected growth for E-Government service delivery channel

Provides for multiple delivery channels.

Internal Pressures and Demands

Enables employees and the enterprise to do more with less

Focuses on results-oriented solutions.

L.2.1. Looking Forward **Interior's existing and proposed information technology (IT) investments will be evaluated to ensure that the Internet-based and other electronic information, services, and program delivery channels have been sufficiently considered. Investments must align with Interior's mission, vision, business goals and objectives. The following types of investments should be identified.**

President's Management Agenda

Expanding Electronic Government is one of the five key elements in the President's Management Agenda. The key goals of this element are to improve IT planning through the budget process and champion citizen-centered electronic government that will result in a major improvement in the Federal Government's value to the citizen. A government-wide E-Government task force (Quicksilver) was convened by the OMB and the President's Management Council in July 2001. The task force selected 24 high priority initiatives

as a part of the Administration's E-Government portfolio. Interior is participating in several of the 24 initiatives, and is serving as managing partner for two; the Geospatial One-Stop initiatve and the Recreation One-Stop initiative. Interior is also the lead agency in the multio-agency Volunteer.Gov/Gov initiative, which is part of the President's USA Freedom Corps network.

Interior's E-Government Strategy

Interior is developing a Departmental E-Government strategy, which will provide a framework for implementing electronic government within the Department. The strategy will be completed in 2003. Upon completion of the strategy, proposed investments should be consistent with the plan.

L.2.2. Major, Significant, and Other IT Investments

Through the Capital Planning and Investment Control Process (CPIC) investments are designated as major, significant, or other IT investments.

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

Total lifecycle costs greater than $35 million

Multiple-agency impact[3]

Mandated by legislation or executive order, or identified by the Secretary as critical

Requires a common infrastructure investment

Department strategic or mandatory-use systems

Differs from or impacts on the Department infrastructure, architecture, or standards guidelines.
All financial systems with a lifecycle 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 in nature or uses e-business technologies.

[3] Lead agency as managing partner submits Exhibit 300.

These investments are considered to be strategic for the Department and, thus, have a greater documentation burden, including being individually reported to OMB on an Exhibit 300B.

- **Significant** IT investments are those investments deemed significant by the agency but do not rise to the definition of "major" (e.g., used by a single agency, agency-wide in scope, relative high lifecycle cost, etc.).
- **Other** IT investments are those investments that are not deemed major or significant. They are generally investments of lower dollar value that are aggregated with other small IT investments to complete the costs included in the agency IT portfolio.

L.2.3. New and Existing Investments

New and existing investments will be evaluated against the following set of criteria. Each investment must address the following questions:

CPIC/I-TIPS:

In which investment phase does this investment fall: Pre-Select, Select, Control, Evaluate, or Steady-State?

If this is an existing investment, indicate the category, based on the CPIC criteria: Major, Significant, or Other.

PMA/E-Government

Does the investment support the President's Management Agenda—Expanding Electronic Government?

Does the investment support one or more Quicksilver initiatives? Identify the initiative name(s)?

If the proposed investment is related to the Geospatial One-Stop initiative or the Recreation One-Stop initiative, has the proposal been coordinated with the Geospatial One-Stop and/or the Recreation One-Stop teams?

Collaboration

Does this project support one agency, multiple agencies, or the entire DOI enterprise?

Does the proposed investment leverage existing or proposed IT investments?

Does the proposed investment unify and simplify program delivery and eliminate redundancy in system development and information and data collection efforts?

Does the proposed investment enable sharing of information more quickly and conveniently between DOI employees and agencies and/or federal and state, local and tribal governments?

Planning & Assessment

Does the proposed investment provide for increased customer-centered government? Identify customer group(s) impacted.

Has business process reengineering/ improvement been conducted?

Does the proposed investment address legislative priorities, GAO material weaknesses, OMB guidelines and/or IG findings?

Does the proposed investment identify, examine and employ, where appropriate, industry best practices?

Does the proposed investment reduce the reporting burden on citizens, public and private entities and/or employees? For information collection from the public, does the proposed investment identify the information collection package control number and associated forms numbers and title and the level of the service provided, (i.e., print, fill, save, submit, transmit)?

Does the proposed investment describe the information and records to be created and the associated records management requirements from creation to disposition, such as records scheduling, migration, etc.?

Does the proposed investment incorporate appropriate privacy safeguards, as needed?

Change Management Component:

Does the proposal include a change management component?

Does the proposed investment address the awareness and training requirements to effect change?

Has the proposal considered governance, communications, training and other change management needs?

Citizen-Focus

Has the project identified specific performance measures and indicators that are geared to citizens' needs?

Will the proposed investment deploy existing or create easy-to-find point(s) of access to DOI services? Will the proposed investment use facilities such as FirstGov or USA Services?

Will a marketing/communications plan promote the products/services to the public? Other government agencies? Business Partners? Internally?

Budget/Finance

Does the investment reduce/eliminate redundant expenditures (intra and inter-Departmental)?

Can multiple agencies collaborate or pool resources?

Architecture/Infrastructure/Security

Does the proposed investment describe the technology components required to support this investment, (e.g., web farm, web server, e-signature, etc.)?

Does the proposed investment advance IT priorities in the areas of enterprise architecture, telecommunication, and information management?

Have security-related components been addressed and

IT APPENDIX M—OMB EXHIBIT 300

The Exhibit 300 is used to document a proposed IT investment. It provides most of the needed information necessary of the IRB to made informed decisions about an investment. It is supplemented by the CBA, Security Plan, Project Plan, etc., when additional information is required by the IRB.

For the Pre-Select Phase, answer questions from the beginning of Part 1 through I.B. Justification, skip I.C. Performance Goals, answer I.D. Program Management, skip I.F. Risk Inventory and Assessment, answer I.H Project and Funding Plan (at a high level for the entire project with details for the Select Phase), discuss the I.H.1 performance-based management system for project performance evaluation through the Select Phase, provide an original baseline in I.H.2. for the Select Phase, and skip the remaining questions in Part 1. Then answer the business case questions in Part II. to the extent possible.

In the Select Phase, answer all the questions completely.

Table M-1 provides the first page of the Exhibit 300. The entire document is available in a Microsoft Word format on the Government Chief Information Officers web site at http://www.cio.gov/. The document is listed under the Document's tab in the OMB Documents and Guidance in the Budget Execution and Reporting page, http://www.cio.gov/documents/Final_Section_300_of_A11.doc.

OMB has the document available in an Adobe PDF format on its web site at: http://www.whitehouse.gov/OMB under Circular A-11 Section 300.

PART 1

Date of Exhibit

Part I: Capital Asset Plan and Business Case (All Assets)									
Agency									
Bureau									
Account Title									
Account Identification Code									
Program Activity									
Name of Project									
Project Initiation Date									
Project Planned Completion Date									
This Project is:	Initial Concept	Planning	Full Acquisition	Steady State	Mixed Life Cycle				
Project/useful segment is funded:						Incrementally		Fully	
Was this project approved by Office of Management and Budget (OMB) for previous year budget cycle?						Yes		No	
Did the Executive/Investment Review Committee approve funding for this project this year?						Yes		No	
Did the CFO review the cost goal?						Yes		No	
Did the Procurement Executive review the acquisition strategy?						Yes		No	

Figure M-1 Part I: Capital Asset Plan and Business Case (Page 1 of 2)

Is this investment included in your agency's annual performance plan or multiple agency annual performance plans?	Yes		No	
Does the project support homeland security goals and objectives, (i.e., (1) improve border and transportation security, (2) combat bioterrorism, (3) enhance first responder programs, and (4) improve information sharing to decrease response times for actions and improve the quality of decision-making)?	Yes		No	
Is this project information technology? (See Section 53 for definition.)	Yes		No	
For information technology projects only:				
a. Is this Project a Financial Management System? (see section 53.2 for definition)	Yes		No	
If so, does this project address a FFMIA compliance area?	Yes		No	
If yes, which compliance area?				
b. Does this project implement electronic transactions or record-keeping that is covered by the Government Paperwork Elimination Act (GPEA)?	Yes		No	
If so, is it included in your GPEA plan (and does not yet provide an electronic option)?	Yes		No	
Does the project already provide an electronic option?	Yes		No	
c. Was a privacy impact assessment performed for this project?	Yes		No	
d. Was this project reviewed as part of the FY2002 Government Information Security Reform Act review process?	Yes		No	
d.1. If yes, were any weaknesses found?	Yes		No	
d.2. Have the weaknesses been incorporated into the agency's corrective action plans?	Yes		No	
e. Has this project been identified as a national critical operation or asset by a Project Matrix review or other agency determination?	Yes		No	
e.1. If no, is this an agency mission-critical or essential service, system, operation, or asset (such as those documented in the agency's COOP Plan), other than those identified as above as national critical infrastructures?	Yes		Yes	

Figure M-1 Part I: Capital Asset Plan and Business Case (Page 2 of 2)

The Exhibit 300 requires budget estimation information. Table M-2 provides a sample of the required table for budget submissions.

I.A. SUMMARY OF SPENDING FOR PROJECT STAGES (In Millions)									
EXISTING 300	PY-1 And Earlier	PY 2001	CY 2002	BY 2003	BY+1 2004	BY+2 2005	BY+3 2006	BY+4 & Beyond	Total
Planning:									
Budget authority									
Outlays									
Full acquisition :									
Budget authority									
Outlays									
Total, sum of stages:									
Budget authority									
Outlays									
Maintenance:									
Budget authority									
Outlays									
Total, all stages:									
Budget authority									
Outlays									

Figure M-2. I.A. Summary of Spending for Project Stages

DOI instructions for completing the Exhibit 300 are under development.

IT APPENDIX N—SECURITY INFRASTRUCTURE GUIDE

OVERVIEW

The Department of the Interior has a long-standing concern for the protection of its vital information and technology resources. The first Departmental computer security policy was issued in May 1980. Since that time, information technology has undergone significant changes. The Department's dependence on automation to accomplish its mission has led to extensive growth in the number and types of computer systems in operation or planned throughout the Department. As a result, automated information security concerns at the Department have increased.

The Department created its first full-time computer security position on August 15, 1988, because of increased Departmental awareness of potential security threats. The Department continues to modify and improve its information technology security program and policies in an effort to try to keep up with changing technology. The latest edition of the Departmental IT Security Plan was published in April 2002.

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.

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 an 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.

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

Interior IT Security Guidance
Information Technology Security 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.

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.

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.

IT Security Program Manager: Roger Mahach
202 208-6194

IT APPENDIX O—RESERVED

IT APPENDIX P—I-TIPS REQUIREMENTS BY PHASE

The following is a checklist for I-TIPS Investment and Portfolio Managers to use when entering information in I-TIPS on their agencies' investments. This list is divided into the five phases of the Capital Planning and Investment Control (CPIC) process. For further instructions on using I-TIPS, please refer to the *I-TIPS Users' Guide, Version 3.02* by selecting the following URL:

P.1 PRE-SELECT PHASE

Create the new investment.

Create a contacts list for this investment.

Add the investment to your agency's Investment Pool and to the agency's Investment Portfolio.

Designate the investment as Major, Significant, or Small/Other.

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.

As directed by your agency, use the established scoring weights and rules in I-TIPS to assist in ranking this investment with others in the portfolio.

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, OCFO, EWG, IRB, and others to view the investment.

P.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.

P.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.

P.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.

P.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.

IT APPENDIX Q—QUARTERLY/MILESTONE CONTROL REVIEW CHECKLIST

During CPIC Control Reviews, the following critical areas should be addressed. The Control Review Team will discuss these areas, and a report shall be given to the team.

1. Status of the critical path:
   a. Where is the investment on the critical path?
   b. If it is behind schedule, by how much?
   c. Is there a strong plan for recovery, and what steps are being taken to recover?
2. Milestone hit rate:
   a. What is the total number of milestones planned vs. the total number actually met?
   b. What is the milestone hit rate since the last control review or since the most recent IRB review?
3. Deliverables hit rate:
   a. What is the number of deliverables provided to date vs. the number planned?
4. Issues:
   a. Have there been issues that had a major effect on the investment?
   b. Are issues logged and evaluated, and resolutions documented?
5. Actual cost-to-date vs. estimated cost-to-date:
   a. What is the total cost-to-date vs. the estimated cost-to-date?
   b. Is Earned Value Management used to measure actual resources expended against planned resources expended and to estimate future performance of projects?
   c. Are causes of cost variances tracked and addressed?
6. Actual resources vs. planned resources:
   a. Are there more or fewer FTEs working vs. number of FTEs planned?
   b. Has there been significant, unplanned turnover among the core team, Project Manager or Sponsor?
7. Have high-probability and high-impact risks been tracked and adequately addressed?
8. Has contractor reporting been adequate?
   a. Does the contractor report by WBS?
      i. Task progress
      ii. Deliverables
      iii. Planned activities
      iv. Expenditures
   b. Are the reports assessed and action taken?

IT APPENDIX R — CPIC PROCESS ASSESSMENT

Focused senior management attention is required to ensure that each bureau's capital planning and investment control process is adequate, well managed and effectively implemented. Improvements to the CPIC process should continuously occur within the context of the organization's evolving needs, objectives and operating plans. The responsibility of facilitating and managing the organization's process improvements are typically assigned to a process group comprised of staff responsible for managing the CPIC process with their organization. The bureaus need to establish and sustain a group to support and maintain a documented standard CPIC process. The bureaus must also provide the long-term commitment and resources required to ensure the overall success of the group's activities.

Although OMB sets the driving guidance and direction of the CPIC process, bureaus have substantial flexibility to fit this standard process within current management processes. Management's commitment and the resources necessary for sustaining and improving a standard process are critical to establishing the CPIC process at each bureau. Utilizing a set of process standards enables consistent performance within each bureau and provides a basis for cumulative, long-term benefits to the bureau that, in turn, provides increased benefits to the Department and the Federal government. Continued improvements to the bureau's process are obtained through various sources, including performance measurements, lessons learned during implementation, results assessment, establishment of baselines and benchmarking against the Department, other bureaus and other Federal agency processes and recommendations from other improvement initiatives.

The General Accounting Office's (GAO) Information Technology Investment Management (ITIM) Stages of Maturity, as described in GAO's May 2000 Version 1 of the ITIM: A Framework for Assessing and Improving Process Maturity, identifies key CPIC processes, creates a means of assessing an organization's capital investment management capability and maturity, and offers recommendations for improvement. ITIM was designed as an analytical tool to aid Federal agencies with establishing and assessing IT investment processes. However, ITIM can also apply to the capital planning and investment control of construction and other capital assets and will be used as a Departmental standard to regularly assess the capability of the Department and individual bureau CPIC processes. The complete GAO publication describing ITIM can be found at http://www.gao.gov/special.pubs/ai10123.pdf.

ITIM, as summarized below in Figure R-1, measures the presence or absence of processes supporting all phases of the CPIC process. ITIM is a valuable tool that (1) supports organizational self-assessment and improvement and (2) provides a standard against which an external evaluation of an organization can be conducted.

MATURITY STAGE	DESCRIPTION	CRITICAL PROCESSES
Stage 1 – Creating Investment Awareness	There is little awareness of investment management techniques. Capital investment management processes are ad hoc, project-centric, and have widely variable outcomes.	• No Defined Critical Processes
Stage 2 – Building the Investment Foundation	Repeatable investment control processes are in place and key foundation capabilities have been implemented.	• Capital Investment Board Operation • Capital Project Oversight • Capital Asset Tracking • Business Needs Identification for Capital Projects • Proposal Selection
Stage 3 – Developing a Complete	Comprehensive capital investment portfolio selection	• Authority Alignment of Capital Investment Boards

MATURITY STAGE	DESCRIPTION	CRITICAL PROCESSES
Investment Portfolio	and control processes are in place that incorporate benefit and risk criteria linked to mission goals and strategies.	• Portfolio Selection Criteria Definition • Investment Analysis • Portfolio Development • Portfolio Performance Oversight
Stage 4 – Improving the Investment Process	Process evaluation techniques focus on improving the performance and management of the organization's capital investment portfolio.	• Post-Implementation Reviews • Portfolio Performance Evaluation and Improvement • Systems and Technology Succession Management
Stage 5 – Investing for Strategic Outcomes	Investment benchmarking and Technology-enabled change management techniques are deployed to strategically shape business outcomes.	• Investment Process Benchmarking • Technology-Enabled Business Process Change Management

FIGURE R-1 – ITIM STAGES OF MATURITY WITH CRITICAL PROCESSES[4]

ITIM as a Tool for Organizational Improvement

ITIM offers a roadmap for improving their capital investment management processes in a systematic and organized manner. These process improvements are intended to:

- ❖ Improve the likelihood that capital investments will be completed on time and on budget;
- ❖ Promote a better understanding and management of capital investment related risks;
- ❖ Ensure that capital investments are selected based on their merits by a well-informed decision-making body;
- ❖ Implement process management improvement ideas and innovations; and
- ❖ Increase the business value and mission performance improvements of capital investments.

The implementation of ITIM as a tool for organizational improvement can be achieved in a variety of ways. For example, an organization can create a separate improvement program, employ external assistance and support, or use it as a managerial support tool. Regardless of the implementation technique, the following important factors should be considered when using ITIM as an organizational improvement tool.

- ❖ Bureaus will have a variety of selection, control, and evaluation processes currently in place across the organization. ITIM can help these organizations understand the relationships among these processes and determine the key opportunities for immediate improvements.
- ❖ ITIM is a structured approach that identifies the key practices for creating and maintaining successful capital investment management processes. However, ITIM describes *what* to do, not *how* to do it. Thus, specific implementation methods can and will vary by organization.
- ❖ The developmental nature of a maturity model means that process maturation is cumulative. Lower stage processes provide the foundation for upper stage processes. As additional critical processes are introduced into and implemented within the organization, the organization attains greater process capabilities and maturity. As additional processes are incorporated within the organization, the maturity progression requires that the organization maintain previously implemented lower stage critical processes at each successive stage of maturity.

[4] The ITIM Stages of Maturity was revised so it can be applied to the management of all capital investments

- ITIM is not a substitute for good project management. While ITIM takes an enterprise-wide focus, good project-level management forms the foundation for successful capital investments.
- Critical processes may be initially implemented and practiced within individual bureaus or divisions before they are implemented and are mature across the organization.
- Within ITIM, business process improvement (BPI) initiatives are not considered to be IT investments but instead are considered to be parallel efforts that may or may not be linked to IT investments. Thus, ITIM assessments do not evaluate individual BPI initiatives. However, if such initiatives do have IT investments, then these IT investments should be subject to the organization's IT investment management process.

ITIM as A Tool for Assessing Maturity of an Organization

Just as ITIM can be used as a tool for organizational improvement, it can also be used as a standard against which the maturity of the capital investment management process of a given organization can be judged. For example, ITIM can be used to support external inspections to ensure compliance with industry standards or acceptable practices, independent reviews of organizational maturity by oversight bodies, or other external CPIC process reviews. Regardless of the specific use, however, the following important factors should be considered when using ITIM as an organizational assessment tool.

- An ITIM assessment can be conducted for an entire organization (e.g., an executive branch department) or for one of its lower level divisions (e.g.. a branch. bureau. or agency). However, the unit or scope of analysis (e.g., branch, bureau, agency. or department) must be defined before conducting an ITIM assessment. Additionally, the assessed maturity stage for a lower level division is not necessarily indicative of the maturity stage of a higher-level division or of the organization as a whole.
- ITIM is applicable to organizations of different sizes. Some of the processes described in ITIM may be implicitly conducted by smaller organizations. For example, although ITIM addresses the organizational need to align and coordinate multiple IT investment boards, clearly a smaller organization with only one investment board would implicitly perform this critical process.
- An organization may be concurrently implementing key practices associated with several maturity stages. In fact, key practices associated with upper stage critical processes are frequently initiated while the organization as a whole is at a lower stage of maturity. However, organizational maturity is determined by assessing at what maturity stage the organization implements all key practices for all of the critical processes associated with a given stage of maturity and any lower maturity stages. For example, performing key practices in just several Stage 3 critical processes does not mean the organization has attained Stage 3 maturity.
- The key practices describe *what* is to be done not *how* it is to be done. Alternative practices may accomplish the underlying purpose of a critical process. The key practices should be interpreted rationally to judge whether the purpose of the critical process is effectively achieved.

Establishing Investment Review Boards: A Critical Initial Step

In order to operate a CPIC process that meets Department certification standards and to make progress in Stage 2 of ITIM, each bureau is to establish and maintain an Investment Review Board (IRB), chaired by the Bureau Head or Deputy Bureau Head. The IRBs are to be comprised of senior bureau managers. 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.

The IRB is to systematically review all pertinent investments and to recommend to its bureau head new capital investments. The IRB evaluates and makes recommendations to the bureau head on existing information technology and construction projects to manage a bureau capital investment portfolio which best supports the Department's missions and program delivery processes. The bureau head will approve

and submit investments for major IT and construction projects into the Department's CPIC process. The decision to proceed includes identifying and approving the needed budget resources. For all phases of the CPIC process, the IRB conducts investment reviews and makes recommendations to the bureau Head. Each IRB will:

- Develop and maintain multi-year capital investment plans for IT and construction investments using the pre-select process;
- Guide business case (Exhibit 300) preparation and review;
- Identify project integration opportunities;
- Score and rank investments;
- Review ongoing projects to ensure that their status, progress, and outlook are satisfactory and consistent with project plans;
- Provide individual investment and portfolio management;
- Identify deficiencies in project management and monitor corrective actions.
- Oversee the bureaus' CPIC process;
- Submit completed business and multi-year plans to PMB and OCIO staff for analysis in support of the Executive CPIC;
- Provide recommendations to the ITMC or CIRB to support their decision to continue, reduce, terminate, or defer IT or construction projects, respectively;
- Conduct periodic reviews of project status, control, performance, risk and outlook for approved and funded projects; and
- Establish and execute the necessary project controls to manage requirements; risk; cost, schedule and technical baselines; and performance outcomes.

At a minimum, the IRB will maintain a documented description or charter outlining their bureau's CPIC process and the roles and responsibilities of the IRB and other entities and bureau offices involved in CPIC. The IRB will develop and use a standard set of criteria to assemble a bureau capital investment portfolio that feeds into the Department's capital investment portfolio. The criteria will be modeled after those developed by the OCIO for IT and the Office of Managing Risk and Public Safety (MRPS) for construction based on OMB criteria. The criteria will include a consideration of Departmental or Government-wide impact, visibility, cost, risk, architecture, and standards. For further information on the bureau IRBs see **Appendix A — Board Procedures**

The steps below need to be accomplished in the short-term along with establishing a bureau IRB. They also apply in strengthening the Department's CPIC processes.

- Establish policy and charters to formalize the roles and activities of the IRB that governs the bureau-level CPIC process;
- Formulate policy and direction to delegate authority and accountability and define roles and responsibilities for the CPIC process;
- Establish and maintain interfaces to the Department's oversight and review organizations, and for the Department with OMB, GAO and other Federal agencies;
- Implement a bureau-wide CPIC process to pre-select, select, control, and continuously evaluate a comprehensive portfolio of capital projects;
- Align the CPIC process with other internal processes such as budget formulation, strategic planning, procurement and acquisition, program management and technical reviews;

- Strengthen the competencies and capabilities of capital investment staff and Project Managers through practical "hands-on" training.

A CPIC Self-Assessment Guide

To help assess bureau progress in navigating the ITIM roadmap toward CPIC maturity, the following self-assessment criteria developed by the Department of Energy will serve as a tool for bureaus and the Department to use in improving and developing their CPIC processes. Below is a list of critical activities that need to occur at each CPIC phase and key questions to aid in assessing progress in achieving sound CPIC processes.

Overall Capital Planning and IT investment Process

- Has the agency developed and published guidelines, which document their process?
- Do the guidelines define where and/or how data on capital projects will be maintained?
- Does the agency maintain and track data on its current capital investment portfolio by category of investment in accordance with current OMB reporting guidelines?

Pre-Select and Selection

Activities

- Screening of proposed investments
- Analyzing and ranking all investments based on benefit, cost, and risk criteria
- Selecting a portfolio of projects
- Establishing project review schedules
- Evidence that each project has met project submission requirements
- Analyses of each project's cost, benefits, and risk
- Data on the existing portfolio
- Scoring and prioritization outcomes
- Project review schedules
- Determining whether projects met process-stipulated requirements
- Deciding upon the mixture of projects in the overall capital investment portfolio

Assessment Questions

- Is there a process in place for screening new capital investments?
- Does the process establish the time guidelines and assign responsibility for scoring and selecting investments?
- Is the data required for the initial project submission clearly defined?
- Have standard benefit, cost, and risk criteria been developed Are the new initiatives required to submit analyses based on these criteria?
- Has the methodology been established to score and develop priorities for IT investments?
- Are all the phases of the process properly documented?
- Have the selected initiatives been linked to the budget?
- Have the selected initiatives been linked to the mission?

Control

Activities

- Consistently monitoring projects
- Involving the right people
- Documenting all actions and decisions

- Feeding lessons learned back in to the selection phase
- Measures of interim results
- Updated analyses of each project's costs, benefits, schedule, and risks
- Deciding whether to cancel, modify, continue or accelerate a project
- Aggregating data and reviewing collective actions taken to date

Questions

- Can capital initiatives be consistently monitored with existing control processes?
- Are the right people assigned to specific roles and responsibilities? Do they have the authority and the expertise to make decisions regarding capital projects?
- Based on the data required to be submitted by each initiative can a decision be made to cancel continue or accelerate the investment process?

Evaluate and Steady-State

Activities

- Conducting post-implementation reviews (PIR) for IT and post-occupancy evaluation (POE) for construction using a standard methodology
- Feeding lessons learned back in to the Selection and Control phases
- Measurements of actual vs. projected performance
- Documented "track record" (project and process)
- Assessing the project's impact on mission performance and determining future prospects for the project
- Revising the selection and control phases based on lessons learned

Questions

- Is there a forum to evaluate capital projects?
- Are the standards used to compare the actual versus projected investment performance?
- Can a project's impact on mission performance be determined?
- Is the methodology in place for analyzing and documenting the lessons learned for the select, control, and evaluate phases? Can the phases be revised or improved based on lessons learned?

IT APPENDIX S—GLOSSARY OF TERMS AND ACRONYMS

S.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 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.

Figure R-1. Glossary (Page 1 of 5)

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.

Figure R-1. Glossary (Page 2 of 5)

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/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.
Information System 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/expense reduction (productivity and headcount), Other expense reductions (operational), Cost/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.

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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 discounted net.
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.
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 Discounted Net.

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Return on Investment	Calculated by dividing the Total Discounted Net 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/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.

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S.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
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	General Accounting 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

Figure R-2. Acronyms (Page 1 of 2)

IPT	Integrated Project Team
IRM	Information Resource Management
ISSPM	Information System Security Program Manager
ISTA	Information System Technology Architecture
IT	Information Technology
I-TIPS	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

Figure R-2. Acronyms (Page 2 of 2)

IT APPENDIX T—REFERENCES

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