Post Implementation Review
Process Description

Version 4.0

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U.S. Department of Education
Federal Student Aid
Union Center Plaza
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Washington, DC 20202

REVISION HISTORY

Date	Revision	Change Description/Purpose
16 January 2003	Post Implementation Review Process Description, Version 1.0, Final	Initial document
27 August 2004	Post Implementation Review Process Description, Version 2.0, Draft	Update with process changes
17 September 2004	Post Implementation Review Process Description, Version 2.0, Final	Update with minor changes
21 November 2005	Post Implementation Review Process Description, Version 3.0, Draft	• Minor text changes to clarify acronym usage. • Clarification of applicability section. • Removed Document Structure Section, as it is duplicative of the table of contents. • Updated CPIC diagram and corresponding text to reflect ED's three phases, rather than four phases in prior versions. • Updated PIR timeframe to 6 to 18 months from go-live, based latest published guidance. • Substantial changes to delivery process section to reflect changes previously implemented by CIO management. • Added Appendix J - Executive Summary Template to add detailed specifications for providing the executive summary.
28 November 2005	Post Implementation Review Process Description, Version 3.0, Draft	Added independence certification requirements for evaluation team.
07 March 2006	Post Implementation Review Process Description, Version 3.0, Draft	Reviewed changes suggested by Acquisition Planning & Contract Management Group and incorporated where appropriate.
08 March 2006	Post Implementation Review Process Description, Version 3.0, Draft	Incorporated editorial comments from CIO/Enterprise Quality Assurance Team.
14 March 2006	Post Implementation Review Process Description, Version 3.0, Final	• Added footnote for 6 to 18 month time frame reference. • Small edits to header/footer and dates for publishing.
15 March 2006	Post Implementation Review Process Description, Version 3.1, Final	• Removed excessive logos from inside pages. • Removed "author" column from revision history. • Corrected page numbers on table of contents.
20 April 2006	Post Implementation Review Process Description, Version 3.2, Final	• Removed footnote referencing a draft Department PIR document. • Changed section 4.1.2 to indicate that review areas are approved by Project

		Sponsor and CIO (Enterprise Quality Assurance Team).
		• Removed Evaluation Team involvement during Select Phase (distribute Advance Package).
16 May 2007	Post Implementation Review Process Description, Version 3.3, Final	• Added description of partial points for PIR scoring in section 2.7. • Discussed scoring of cost section.
30 May 2008	Post Implementation Review Process Description, Version 4.0, Draft	• Correct CIO from "Chief Information Office" to "Chief Information Officer" • Sec 1.4 Applicability: Added "IT" to "applications" • Sec 2.5 Kick-off Meeting: Added kick-off agenda and pre-kickoff clauses on PIR for a large-scale project • Sec 2.6 Scoring of PIRs: On scoring, added a clause for using ACSI survey • Sec 2.6 Scoring of PIRs: Cited OMB A-11 for Cost or Schedule variance on managing capital assets • Sec 2.6 Scoring of PIRs: Added a clause on +/- 10% cost/schedule variation • Sec 3.4 Project Development Team: Added a clause on timely documents submission • Sec 4.1.1 Chief Information Officer: Added a clause of business case collection responsibility • Sec 4.2.5 Evaluation Team: Added "ACSI" • Sec 5.2.10 Cost: Added a clause of Cost beyond project team's control • Sec 5.2.12.3 Survey Deployment: Added a clause on using ACSI • Appendix G: Added "Lessons Learned" • Appendix H: Added "4.0 Recommendations" and changes to headings of Appendixes B and C.
4 June 2009	Post Implementation Review Process Description, Version 4.0	• Sec 2.6 Scoring of PIRs: Modified Cost Data source and score rating rule. • Sec 5.2.10 Cost: Added a paragraph to explain the Cost Data source from Business Case to CFO Budget Group • Add Sec 6 PIR Report Conclusion and Recommendations • On Appendix G: PIR Scorecard Template, add Cost rating criteria and Survey rating (when ACSI Results are used). • On Appendix H: PIR Report Format, add "4.0 Conclusion and Recommendations" • All sections: Conducted grammatical checks

Table of Contents

1   Introduction

1.1   Purpose

The purpose of the Post Implementation Review Process Description is to establish guidelines and common procedures that define the objectives, activities and documentation required to perform a Post Implementation Review (PIR) on a project executed by the Department of Education (ED), Office of Federal Student Aid (Federal Student Aid).

1.2   Background

In order to address federal legislation and guidance provided by Office of Management and Budget (OMB) and General Accounting Office (GAO), Federal Student Aid has institutionalized a PIR process. The Clinger-Cohen Act (CCA) and the OMB Capital Programming Guide require the review of Information Technology (IT) investments to ensure that they are functioning effectively and satisfying customers' needs. By following this process, benefits are realized throughout Federal Student Aid and the Department of Education. Federal Student Aid's objective is to refine a PIR process that provides CCA PIR results to senior managers for use in a Capital Planning and Investment Control (CPIC) process that will systematically maximize the benefits of IT investments.

By conducting PIRs, Federal Student Aid can ensure that investment intensive projects achieve intended goals, and make necessary modifications throughout the implementation of the project. Federal Student Aid's PIR process is designed in compliance with IT management legislation and regulatory guidance including:

♦ **Clinger-Cohen Act of 1996**. The CCA requires that agencies undertake CPIC by establishing a process for maximizing the value and assessing and managing risks of IT acquisitions of the agency. Federal agencies are required to focus on the results achieved through IT investments while streamlining the federal IT procurement process. Specifically, this Act introduces much more rigor and structure into how agencies approach the selection and management of IT projects. Among other responsibilities, the head of each agency is required to implement a process for maximizing the value and assessing and managing the risks of the agency's IT acquisitions.

♦ **The Government Performance and Results Act of 1993 (GPRA).** GPRA requires agencies to define missions, set goals, measure performance, and report on their accomplishments. A key tenet of GPRA is that agencies develop strategic plans, as well as annual performance plans that establish the organization's goals, objectives and strategies for achieving these goals. As such, an agency's IT investments should directly support the accomplishment of these goals.

GPRA systematically holds Federal agencies accountable for achieving program results. The act requires agencies to:
- Set program goals
- Measure performance against those goals
- Report progress publicly
- Improve program effectiveness and accountability by promoting a new focus on results, service quality, and customer satisfaction
- Improve service delivery by planning to meet program objectives and providing information about program results and service quality

♦ **OMB Circular A-11.** Circular A-11 provides detailed instructions and guidance on the preparation and submission of agency budget requests and related materials, including program performance information. The Circular provides specific instructions on the preparation and submission of agency strategic plans, as required by GPRA. It also provides guidance on the planning, budgeting, and acquisition management of major fixed assets and requires agencies to provide information on all major capital asset projects included in their budget submissions to OMB. .

♦ **OMB Circular A-130, *Management of Federal Information Resources.*** OMB Circular A-130 provides information resource management policies on Federal Information Management/Information Technology. Recent revisions to A-130 cause information systems and information technology management to more closely follow the provisions of CCA and OMB Circular A-11, which involve the acquisition, use, and disposal of information technology as a capital asset by federal programs. OMB Circular A-130 calls for PIRs on IT initiatives to validate estimated benefits and costs. It stresses the need for the evaluation of systems to ensure positive return on investment, as well as the documentation of lessons learned from the review.

♦ **GAO-04-394G, Information Technology Investment Management (ITIM):** *A Framework for Assessing and Improving Process Maturity.* The GAO ITIM Process Maturity Framework provides a process for evaluating and assessing how well a federal agency is selecting and managing its IT investments and identifies areas where improvements can be made. GAO recommends performing PIRs for the purpose of evaluating an investment after implementation in order to validate actual investment results and to extract lessons learned to be used for IT Investment Management process improvement.

In addition, other statutes require Federal agencies to revise their operational and management practices to achieve greater mission efficiency and effectiveness. These laws are:

- The Chief Financial Officers Act of 1990,
- The Federal Acquisition Streamlining Act of 1994,
- The Paperwork Reduction Act of 1995,
- The Government Paperwork Elimination Act of 1998.

In order to institutionalize the PIR Process for Federal Student Aid, standards, guidelines and templates have been developed and are contained in this document. The institutionalization of the PIR Process can generate short-term and long-term benefits to Federal Student Aid IT investments. These benefits include:

- Ensuring that investment intensive projects achieve intended goals, and make necessary modifications throughout the implementation of the project;
- Establishing a common approach for IT Investment evaluation within Federal Student Aid;
- Incorporating experiences and lessons learned from the system development efforts and from the evaluation process; and
- Fostering process improvement through the definition of standards and procedures.

1.3 Process Sponsor

This process was developed at the direction of the Federal Student Aid's Chief Information Officer (CIO). All proposed changes to this document should be submitted to the CIO/Enterprise Quality Assurance Team for review. All approved changes will be incorporated in future versions of this document.

Federal Student Aid's Enterprise Quality Assurance (QA) team within the Chief Information Officer coordinates all PIRs. The results of the PIR are used by Federal Student Aid to help inform future IT investment decisions and to guide future investment initiatives in getting the most for their investment. The PIR process validates that the agency and its customers receive all of the intended benefits anticipated when the investment decision was made.

1.4 Applicability

The PIR Process may apply to any financially or functionally significant releases of IT applications, products, or services. A PIR is not restricted to newly operational systems. All IT investments that deliver key services require a PIR. In the case of a terminated system, the PIR should take place immediately at the end of the system's phase out of service because the review will help to define

any lessons learned that can be factored into future IT investment decisions and activities, including replacement systems.

This document includes generic and reusable PIR support templates, as well as a description of the PIR process. This PIR Process Description is a living document. The lessons learned and process improvement benefits of institutionalizing PIRs will be incorporated in future versions of this document. Likewise, changes in policies, also, will be incorporated in future publication of this document.

2 The PIR Process

2.1 Why Conduct a PIR?

PIRs are designed to evaluate how Federal Student Aid implements its information technology (IT) projects. In addition, there are several pieces of Federal Legislation provided by OMB and GAO that call for reviews of each IT investment. A PIR seeks to answer the question, "Did Federal Student Aid spend its money well?" This question is answered by:

- Exploring a project's Return on Investment (ROI) by examining the differences between estimated versus actual investment costs and benefits.
- Providing a set of recommendations that can be used as the basis for improvements in the investment management process. Wherever ROI falls short of the expected goals, lessons learned are provided that can be implemented for future efforts.

Although it bears some of the hallmarks of an audit, a PIR is not considered an audit. PIRs are regularly scheduled reviews of IT initiatives.

2.2 How does a PIR fit into the Big Picture?

The PIR process, as mandated by CCA, is a small component of a complete CPIC process. At the highest level, the CPIC process is a circular flow of IT investments through three sequential phases. Figure 3-1 below depicts a high level view of the CPIC process.
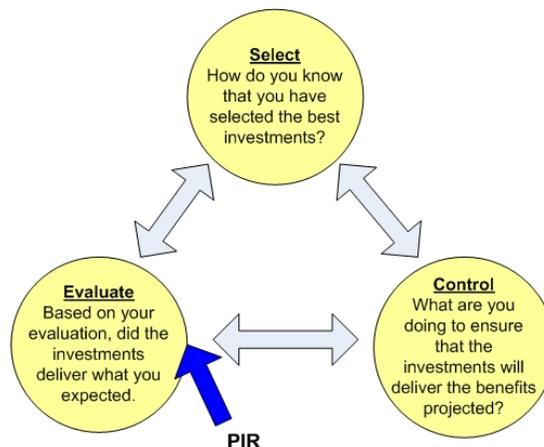
Figure 3-1: CPIC Cycle

These phases are defined as:

1. <u>Select Phase</u>—Investment analyses are conducted that enable the choice of IT projects that best support the mission of the organization, support the defined approach to enterprise architecture, and are prepared for success.
2. <u>Control Phase</u>—Leaders ensure, through timely oversight, quality control, and executive review, that IT initiatives are executed or developed in a disciplined, well-managed, and consistent manner.
3. <u>Evaluate Phase</u>—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 investment management process based on lessons learned. For Federal Student Aid, a Steady-State does not truly exist, since the vast majority of systems are in a constant state of upgrade.

The PIR is a critical part of the Evaluate Phase. In fact, the PIR activity falls into the Evaluate Phase as the first step in providing an investment assessment. PIR results and appropriate action recommendations are key factors in evaluating a project's success.

2.3   The Advance Package

In support of the PIR, during business case development, a PIR Advance Package should be provided to the project management support and project sponsor. The Advance Package contains:

- A brief description of the PIR Process
- A Recommendation Checklist (Appendix I)
- A list of documents required to support PIRs (Appendix C)
- The recommended PIR Report format (Appendix H)
- PIR Scorecard Template (Appendix G)

Providing these documents early in the CPIC process will help to foster and institutionalize the PIR process. In particular, the list of documents and the general PIR schedule, will allow the PIR participants to provide timely and adequate information during the PIR process.

2.4   Scheduling a PIR

Typically, a PIR is conducted 6 to 18 months after the system becomes operational.[1] This timeframe permits the project development team to move the system into its production environment and stabilize it; and permits users to put the system into day-to-day usage. If the PIR is conducted too late, the benefits may be limited because the institutional knowledge of the project may be lost or the PIR results will be too late to provide timely guidance to future development efforts.

PIRs are coordinated by the Federal Student Aid, CIO Enterprise Quality Assurance Team (with contractor support). A group of PIR-candidate IT investments are identified annually and are approved by CIO management for review. The QA Team coordinates the PIR schedule with the business area that has responsibility for the selected investment.

Generic High Level Schedule

Event	Timeline	Responsible Groups
Identification of IT Investments for PIR	Annual Process	QA Team, CIO Management
Advance coordination of specific PIR (establish start date and gather initial documentation)	As needed	QA Team Business Units
Official PIR Kick-off Meeting	PIR Start Date	QA Team Business Unit PIR Support Contractor Other Contractors (as appropriate)
Deploy Survey	PIR Start Date +2 weeks	QA Team Business Unit PIR Support Contractor
Survey Complete/Results Analysis	PIR Start Date +4 weeks	PIR Support Contractor
Deadline for submission of all documentation to be considered in PIR	PIR Start Date +6 weeks	QA Team Business Unit Staff PIR Support Contractor Other Contractors (as appropriate)
- 1st Draft PIR Report Delivered	PIR Start Date +7 weeks	PIR Support Contractor
- Federal Student Aid Review and Feedback on 1st Draft PIR Report - PIR Debrief Meeting	PIR Start Date +9 weeks	QA Team Business Unit
2nd Draft PIR Report Delivered (if needed)	PIR Start Date +10 weeks	PIR Support Contractor
Federal Student Aid Review and Feedback on 2nd Draft PIR Report	PIR Start Date +11 weeks	QA Team Business Unit Staff
Final PIR Report Delivered *Copies delivered to both business unit and CIO Management*	PIR Start Date +12 weeks	QA Team PIR Support Contractor

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[1] GAO, Information Technology Investment Management, A Framework for Assessing and Improving Process Maturity, March 2004, p. 83.

Incorporate relevant PIR recommendations and lessons learned into future planning via CPIC process.	Next Opportunity	Federal Student Aid Management CIO Management Business Unit

Note: Documentation analysis occurs throughout the process. This schedule is generic and may be tailored to accommodate needs of specific investments.

2.5 Kick-off Meeting

The objective and scope of the PIR must be clearly defined and communicated to all participants. Communication among participants will foster cooperation within the PIR process. Thus, the Evaluation Team must be introduced to the project stakeholders and project development team in order to facilitate communication and cooperation.

A PIR Kick-off meeting marks the beginning of the PIR process and allows the participants to meet before the review begins. The Kick-off meeting helps to inform participants of the level of involvement that will be required to perform the PIR. In addition, the items contained in the Advance Package are re-introduced. Also, the evaluation team describes the PIR process, allowing participants to clarify any questions prior to beginning the review. Regardless of the project selected to undergo the PIR, the objective of the PIR is to assess overall how well the project outcomes matched initial goals as an IT investment.

A typical agenda of a PIR kick-off meeting will include:
- Introduction
- Policies governing PIR
- Benefits of conducting PIR
- How the PIR fit into the CPIC cycle
- Personnel security clearance
- Team collaborative approach to the PIR
- Scope of the PIR and associated business case
- PIR evaluation area
- Artifacts (documentation, invoices, emails, etc.) collection
- Of Surveys
- PIR report
- General schedule of a PIR

For a large scale or complicated project, a pre-kickoff meeting, with sufficient timeframe before having a kick-off meeting, should be held to help understanding and clarification of the PIR in advance. This will help both the evaluation and the project teams' sufficient time for preparing the PIR before the kickoff meeting from which an official PIR task begins.

8

PIR Process Overview

Once the PIR has begun, the following steps in the PIR are performed:

Step One - Assess mission needs and determine project goals.
Step Two - Collect and analyze data.
Step Three - Provide major findings and issues.
Step Four - Provide feedback and incorporate lessons learned.

Each step is described in detail in Section 4 Post Implementation Review Roadmap.

Each step is built upon the successful completion of the previous step. This methodology focuses on determining if the system yielded the expected results in accordance with the initial goals, objectives, performance measures, and management and user requirements defined by executive management, CIO, and project management during the Select and Control phases of the CPIC process.

Since the CPIC Process is cyclical, all PIR process improvement recommendations that have been approved by authorized management will be incorporated into the PIR process for the next iteration of the project and for any future projects. Furthermore, lessons learned, also, may be incorporated into the Select and Control Phase in order to improve the PIR process. Sections 4.1 through 4.4 further describe the PIR process and the tasks involved during each step of the PIR process.

2.6   Scoring of PIRs

Each evaluation area contains a list of identified goals found by the PIR evaluation team with attribution to the source document. The PIR evaluation team examines project documentation for measurements that determine whether goals have been achieved, partially achieved or not achieved using the following scale:

Goal Characterization Key	
Achieved (1)	The individual PIR goal is documented and has been fully achieved.
Partially Achieved (.5)	The individual PIR goal is partially documented and/or has been partially achieved.
Not Achieved (0)	The individual PIR goal is not documented and/or has not been achieved.

The variation between goals identified and measurements observed is included in the variance section of each evaluation area. A numerical summation of the number of goals achieved, partially achieved and not achieved is made and divided by the number of goals to compute the total percentage of goal compliance for each evaluation area. This goal compliance number is used as the basis for the rating determination of each evaluation area.

Any sections that do not apply to a particular project can be marked Not Applicable (N/A). A section is considered not applicable only if it can be clearly shown through documentation that the evaluation area was outside of the scope of the review, as defined during the Kickoff Meeting. For instance, a project's Task Order might clearly assign the duties involved with Security to a different task that is not part of the defined PIR scope. If a section is considered N/A, the reasoning and documentation behind this decision should be cited in the PIR document.

Each Evaluation area of a PIR receives a score on the scorecard. The following Key describes the possible scores:

PIR Rating Key	
High (5)	All goals in the PIR category documented and all of those documented project goals achieved.
Medium High (4)	80-99% of documented project goals achieved.
Medium (3)	60-79% of documented project goals achieved.
Medium Low (2)	40- 59% of documented project goals achieved.
Low (1)	Less than 40% of documented project goals achieved.
Incomplete (0)	Little or no documentation provided. Review could not be completed.

Scoring of Customer and User Satisfaction:
When the American Customer Satisfaction Index (ACSI) instrument was employed for the Customer and User satisfaction survey, the determination of PIR score will follow the ACSI results, classified by Excellent, Good, Fair and Poor which correspond to scores of 5, 4, 3, and 2, respectively, as shown in above matrix chart. That is, if the customer satisfaction index is within the range of Excellence as reported in the ACSI survey, the score will be 5 and so on.

Scoring of Cost:
The PIR evaluation team will use the budget data provided by FSA CFO (the financial report) for the PIR Baseline Cost.

Cost Rating Rule
Once a cost baseline has been set, the following cost rating rule applies:

High (5): Cost variance of +2% (over-expended) or up to -2% (under- expended).

Medium expended High (4): Cost variance of up to +5% (over- expended) or -5%

(under- expended).

Medium (3): Cost variance of up to +10% (over-expended) or -10% (under-expended)

Medium Low (2): Cost variance of up to +20% (over-expended) or -20% (under-expended).

Low (1): Cost variance is greater than +20% or -20%

Incomplete (0): Insufficient documentation exists to complete a cost analysis for this investment.

Neutral: Unable to complete cost analysis due to reasons outside of the control of both the project team and the PIR review team. Note that the project team is responsible for tracking their budget and funds spent. A lack of documentation on the part of the project team may not result in a neutral rating.

Following is the summary of the Scores for Cost PIR area based on the budgeted fund provided by FSA CFO.

Cost Rating Key	
High (5)	Project cost expended is within ±2% of budgeted.
Medium High (4)	Project cost expended from 2.1% to 5.0% or -2.1% to -5.0% of budgeted
Medium (3)	Project cost expended from 5.1% to 10.0% or -5.1% to -10.0% of budgeted
Medium Low (2)	Project cost expended from 10.1% to 20.0% or -10.1% to -20.0% of budgeted
Low (1)	Project cost expended over ±20% of budgeted
Incomplete (0)	Little or no documentation provided. Review could not be completed.

Cost variance is determined by a comparison of the actual expenditures "Invoiced Cost" to the established Cost Baseline.

2.7   Delivery Process

Upon completion of the PIR, The Evaluation Team will deliver a draft of the report to the Project Management Team and the QA Team. Federal Student Aid will have two calendar weeks from delivery of the draft report to review the report and request any changes. At this time, a PIR Debriefing meeting may be held. The project management team, the QA team, and the PIR Evaluation team should have representatives attend the Debriefing meeting. This meeting provides an opportunity to go over the results of the report, and provides a forum to raise any

issues discovered upon the document review. Any requests for changes to the document should be discussed and the solution agreed upon during the PIR debrief.

 If any substantive changes are requested, Federal Student Aid is required to provide clear documentation indicating any information not seen during the review, including clearly marked sections of documentation, highlighting information salient to the change. Corrections will be made within one week and a second draft will be provided. Federal Student Aid will have one week to review the second draft and request any additional changes or clarifications. The Evaluation Team then has one week to make any requested changes and deliver a final version of the report to the QA Team. Once Federal Student Aid QA Team has approved the final report, it is posted to the PIR eRoom site for use by approved Federal Student Aid personnel.

In addition, the Evaluation Team will deliver a CD containing all source documents utilized during the PIR, in Adobe Acrobat (PDF) format to the QA Team. Original source documentation shall be returned to the person or office that furnished the documents.

3   Roles and Responsibilities

3.1   Chief Information Officer

As a senior representative of agency management, the Chief Information Officer (CIO) monitors the risk, political implications, and business benefits of the PIR process, as well as the final approval of the system implementation. The CIO monitors each project investment at an executive level to ensure that the operational system supports organizational needs and also supports the Federal Student Aid mission as a stable IT capital investment. The CIO, in conjunction with the project sponsor and management, decides whether to continue, modify or cancel the system development effort. All lessons learned at the end of the PIR can be incorporated into future selection and control decisions. This will assist the CIO in strategic and capital investment planning.

3.2   Project Sponsor

In support of the PIR, the business unit project sponsor ensures that all appropriate project development team members and the project support management team assist the PIR evaluation team. The project sponsor, or system owner, reviews all information collected by the evaluation team in the PIR report. Subsequently, the results of the review should be provided to the CIO. Authorized management and the project sponsor, along with the CIO, will decide whether to make changes to the system.

3.3   Project Management Support Team

During initial system development, the business unit's project management support team monitors all project related costs, schedules and activities. Thus, this team is responsible for all aspects of the system's completion and implementation. In addition, this team works with the stakeholders to define baseline project goals and performance measures. This team may be supported by an IV&V Team, which reviews the development process and identifies potential areas of concern. The project management support team also reviews and incorporates lessons learned at the end of the PIR process. The results of the PIR may result in changes and improvements in the management of future projects.

3.4   Project Development Team

For the PIR, the business unit's project development team provides the project history and describes the project experience. The project development team provides much of the required project documentation to the evaluation team. The development team's experiences and lessons learned, as discovered and recorded during the development and PIR processes, may result in changes in the development of future projects. Likewise, their participation in the PIR process contributes to the success and realized benefits of the PIR process. The project development team works closely with the project management support team and primary stakeholders, such as the CIO, project sponsor, users and customers, to define the performance measures and expected benefits during the Vision Phase of the Lifecycle Management Framework (LCM).

Note that late submission of the requested documents to the Evaluation Team has an impact on the completeness of the PIR for the project. Be sure the requested documents are submitted to the Evaluation Team promptly and timely.

3.5   Evaluation Team

The evaluation team (including the PIR support contractor) performs the PIR under the direction of Federal Student Aid 's CIO. The evaluation team will review the system impact on the Federal Student Aid's mission, assess the technical capability of the system, and measure actual performance of the system versus projected performance. The evaluation team collects data and reviews project documentation from the CIO, project sponsor, project management support team, and project development team. In addition, the evaluation team collects independent customer and user feedback from other stakeholders. At the end of the PIR process, the evaluation team provides the Post Implementation Review Report to the project management support team, project sponsor, and CIO.

Evaluation Team Composition

The evaluation team should be created as an independent review group. The members of the evaluation team should not have participated in the actual development of the system. Though the team may include personnel that participated in the original requirements definition of the system or provided technical guidance, evaluation team members should not have performed actual implementation activities like design development or coding. Likewise, the evaluation team should not include anyone who will benefit from either a positive or negative PIR report. The evaluation team should not be biased to report false successes or failures for the project under review. Federal Student Aid will receive the most productive PIR report from a team tasked and dedicated to factually reporting on the project's results. As part of the PIR report, the Evaluation Team will produce a certification of contractual, financial, technical, and managerial independence from the Project Development and Project Management Support teams.

The evaluation team should be composed of members with varied skill backgrounds that relate to the project to be reviewed. Experience for evaluation team members should include actual system development, security standards implementation, project cost and schedule management, and information technology product review. A mixture of these skills will permit the evaluation team to provide a knowledgeable review, while limiting the amount of basic development project background information needed to complete the PIR. One of the goals for an evaluation team is to minimize the intrusion or operational impact it has on the deployed system and its administrative staff. Ideally, the evaluation team will have the experience to review the provided detailed project documentation without the need to interrupt any system support personnel or to perform outside technical research.

4 Post Implementation Review Roadmap

4.1 Step One – Assess Mission Needs and Determine Project Goals

Project baselines should be established in the Select phase of the CPIC process. Effective pre-planning for conducting a PIR involves the coordination between all PIR participants early in the Select phase. During this phase, executive decision-makers evaluate proposed investments and assess how each investment will strategically support Federal Student Aid's needs and vision. The project sponsor advocates a specific investment or project that best supports the mission of Federal Student Aid. Once a proposed IT solution has been selected, specific project goals and metrics are determined. The baseline goals should include cost, scheduling, risk and performance measures used to control the project during the SDLC. These measures help to define the deployed system's functionality and project objectives.

By the end of the Select phase, the project management support team should have detailed project goals and metrics. In addition, in order to ensure a successful PIR, the project development team needs to identify how those metrics will be captured during the system's development in order to determine if the project is achieving its set objectives. For instance, all system development projects entering the Evaluate Phase should have already established measurable project milestones and associated cost values to accomplish those milestones.

Step One involves assessing Federal Student Aid's needs, identifying a proposed system implementation project, and determining the project goals and performance measures. Because goal setting early in the CPIC process supports the PIR evaluation team's ability to assess mission needs and determine project goals, the roles of the CIO, Project Sponsor, Project Management Support Team, and Project Development Team begin prior to initiation of the PIR. The subsections below describe the actions that may be performed by each of the contributors before and during Step One of the PIR process. These actions are summarized in Table 4-1 below.

Table 4-1: Step One of the PIR Process

PIR Participant	Actions
CIO	❑ Support identification of strategic goals and vision during Select Phase of CPIC
Project Sponsor	❑ Review Advance Package at onset of project ❑ Determine system goals and metrics early in life cycle ❑ Provide documentation to PIR evaluation team
Project Management Support	❑ Review Advance Package at onset of project

Team	☐ Determine system goals and metrics prior to development ☐ Provide documentation to PIR evaluation team
Project Development Team	☐ Review Pre-Select Package at onset of project ☐ Review project goals and methods to be used to capture the associated metrics during development ☐ During development, create documentation needed for PIR
Evaluation Team	☐ Tailor PIR Checklist ☐ Tailor PIR Evaluation Worksheet Template ☐ Develop and distribute PIR Schedule at PIR kick-off ☐ Collect project documentation ☐ Review documentation to verify project goals

4.1.1 Chief Information Officer

Prior to Step One of the PIR process, the CIO supports the identification of strategic goals of the proposed project based on Federal Student Aid's mission. Specifically, the CIO provides guidance on the vision, concept of operations, and business case for the development effort.

It is the responsibility of the CIO office to gather the project's Business Case and/or Vision documents from which the project's goals will be determined.

4.1.2 Project Sponsor

For a proposed project, the project sponsor determines the high-level project goals. The project sponsor not only ensures that the project goals will align with Federal Student Aid's mission, but that these goals will be quantifiable so that they can be measured by the evaluation team. For example, the project sponsor might identify a goal defining the proposed schedule of the system and plan to measure that goal by utilizing project management software.

Ideally, to assist the project sponsor in defining general goals and metrics, the project sponsor will have been provided with an Advance package by CIO early in the CPIC process. The purpose of the Advance package is to inform the Project Sponsor about the upcoming PIR and identify potential areas for review. The project sponsor, CIO, and other authorized management will coordinate with the evaluation team to identify the appropriate evaluation areas for the PIR.

The project sponsor may ensure that the proposed project complies with Federal Student Aid's standards and procedures. For a system development effort, goals and requirements of the system may include:

- Accessibility – For example, the system complies with the organization's guidelines mandating that the system be accessible to all authorized system users including users with disabilities.

- Architectural Compliance – For instance, all interfaces and system components are compatible with current architectural industry and organizational standards and policies.

- Risk Mitigation – For example, specific requirements have been implemented successfully within the system and potential risks have been identified and properly mitigated.

- Security – For instance, the security requirements are documented and enforced.

Once the PIR has begun, the project sponsor should provide documentation of the various goals that serve as the baseline for evaluating the implementation of the project. At the start of the PIR, the project sponsor is provided with a PIR schedule, which documents PIR milestones and activities. This will provide the project sponsor and other PIR participants with a timeline of PIR events.

4.1.3 Project Management Support Team

The project management support team is responsible for all aspects of the system's completion and implementation. During development, the project management support team translates the goals identified by the Project Sponsor and CIO into specific requirements and development activities. The project management support team further defines the project metrics and develops the project plan and the requirements document.

Prior to development, the project management support team also receives the Advance package that identifies a list of specific documents that may be used in order to conduct the PIR. Then, the project management support team can ensure that all needed documents can be completed and available for review during the PIR.   At the PIR kickoff meeting, the project management support team will be provided with a PIR schedule that will include dates by which interviews, surveys and information meetings to support a PIR need to be completed. The project management support team will work with the project sponsor to coordinate PIR resources and respond to document requests from the evaluation team.

4.1.4 Project Development Team

In most cases, the project development team will be established and organized during the Select and Control phases of the CPIC cycle. To support the success

of the upcoming PIR, the project development team should have access to the Advance package and be aware of the PIR process and its purpose, as well as the need to support the creation of the PIR required documents.

4.1.5 Evaluation Team

In Step One of the PIR process, the evaluation team must determine what the project's original goals were in each of the assessment areas deemed important by the project sponsor and management. The evaluation team then determines what specific quantitative and qualitative criteria were established to define performance measures and baseline goals. The evaluation team works with the project sponsor, as well as the project management support and development team to identify and prioritize the level of importance of each of the evaluation topics to the key stakeholders. Ultimately, the determination to assign a weight or level of importance to each of the evaluation areas can only be made by the project sponsor and authorized management. As a result, an objective rating scale will be developed to quantitatively determine if overall project goals were achieved.

In order to make an overall project assessment, the evaluation team may utilize a PIR Recommendation Checklist. The checklist assists the project manager in preparing for a PIR by breaking down/highlighting each of the PIR evaluation areas through a series of questions. The document contains a checklist of recommended items that will improve the probability of project success. The PIR checklist is provided in Appendix I.

The PIR checklist serves two purposes. First, the creation of the checklist helps to outline the intended areas to be evaluated and provides an assessment of the completeness of the evaluation topics. Secondly, the completion of the checklist may indicate any areas for improvement. The PIR checklist becomes the basis of the PIR Evaluation Worksheet. The evaluation team utilizes a PIR Evaluation Worksheet that documents the following: baseline goals, actual results, variance and comments/reasons.

At the end of Step One, the evaluation team will record all information pertaining to the project's goals using the Recommended PIR Report Format shown in appendix H. The recommended format was derived by reviewing the information deemed important by OMB, GAO and General Services Administration (GSA). A list of all references used to determine the recommended evaluation areas is provided in Appendix B.

In addition, during Step One of the PIR Process, the evaluation team develops and distributes a PIR Schedule to the participants. Although modifications to the original PIR Schedule can occur, the schedule will serve as a high-level work plan for the evaluation team.

4.2   Step Two – Collect and Analyze Data

The most critical and often most time-consuming stage of the PIR process is the data collection and analysis. This stage in the PIR process is dependent upon the successful completion of the previous activities of identifying the baseline goals and gathering the actual project results provided by the project management support team and project development team. During Step Two, the evaluation team compiles these project results, records any variance between the planned results and actual results, and considers the documented reasons that explain these differences. A variance in one project goal may impact multiple areas.

The subsections below describe the actions that may be performed by each of the contributors during Step Three of the PIR process. Table 4-2 summarizes this step of the PIR process.

Table 4-2: Step Two of the PIR Process

PIR Participant	Actions
CIO	❑ No action required
Project Sponsor	❑ Ensure resources are available to evaluation team ❑ Confirm baseline goals during PIR
Project Management Support Team	❑ Deliver requested documents to evaluation team ❑ Remain available for consultation with evaluation team
Project Development Team	❑ Representatives remain available for consultation with evaluation team
Evaluation Team	❑ Collect data ❑ Translate data ❑ Deploy and analyze survey results ❑ Relate Findings to PIR objective ❑ Prepare PIR Draft Report

4.2.1   Chief Information Officer

The CIO is not directly involved in this step of the PIR process. The CIO does not perform detailed project data analysis or comparison.

4.2.2   Project Sponsor

The project sponsor ensures that the appropriate people and resources are available and can provide actual data results to the evaluation team. The project sponsor does not compare or analyze the data in Step Two of the PIR process. However, the project sponsor does monitor the progress of the evaluation team

during data analysis and comparison. As the evaluation team compares the planned goals with the actual results, it may confirm baseline goals and performance metrics with the project sponsor.

4.2.3 Project Management Support Team

The project management support team is responsible for delivering the required documentation to the evaluation team. These documents are listed in the Pre-Select phase package that was delivered to the project management support team at the outset of the implementation effort and again at the PIR kickoff meeting. In addition, the project management support team assists the evaluation team by providing additional documentation that may provide insight as to the deviations from the original plans and goals.

4.2.4 Project Development Team

In order to conduct the PIR in an objective manner, the project development team is not typically part of the evaluation team. However, the project development team can provide additional insight during the data analysis phase to the evaluation team. The project development team can provide details on the project development history, respond to specific questions, and help the evaluation team translate project data during the analysis effort.

4.2.5 Evaluation Team

The evaluation team collects the actual project results from the project management support team, the project sponsor, and CIO. Once all documented performance metrics and project goals have been identified in Step One, the evaluation team must determine the actual results. These can be gathered through a combination of data collection techniques. Data collection is primarily performed through the following methods.

Documentation Review and Observation - The PIR process is heavily dependent upon the amount of project documentation provided by the project management support team. Documentation review is the primary means of data analysis. Project documents contain planned performance goals, as well as actual results. These documents also may identify references and points of contact that can be interviewed to collect additional project information.

Project Surveys and Questionnaires - Customers and users of the system should be surveyed by the evaluation team, in order to provide feedback on the system's performance measures, benefits and service. A customer is defined as a person or group that receives data or other product from the system. A user is defined as a person who interfaces directly with the system to access, enter,

process or retrieve information. Therefore, a user may utilize the system solely to produce information for a Customer.

When designing the survey, the scope and definition of the survey will not only depend upon whether customers or users are surveyed, but whether the survey participants are internal or external to Federal Student Aid. The attributes for customers and users for internal and external surveys are provided in Tables 4-3 and 4-4, respectively.

Table 4-3: Internal Survey Attributes for Customers and Users

Attribute	Customer	User
Source	ED employees that use the data from the system *For example: Managers who want to know system usage information*	ED employees that cause the system to execute *For example: Telephone operators who capture citizen requests*
Size of Population	Defined by ED *For example: Job responsibilities determine need for data*	Defined by ED *For example: Part of employee's job is to capture data*
Primary Product of System	Reports *For example: usage reports or lists of Citizen requests*	Data Manipulation *For example: Entry of financial approval*
System Role in Person's Focus	System Effectiveness or Citizen/School support *For example: System is just a data supplier*	Main task accomplishment tool *For example: System is the primary/only way the data is managed*

Table 4-4: External Survey Attributes for Customers and Users

Attribute	Customer	User
Source	Group that benefits from the data processed by the system *For example: Managers who want to know system usage information*	Non-ED staff and support personnel processing data for Customer group. *For example: Students applying for aid*
Size of Population	Defined by ED *For example: Job responsibilities determine need for data*	Based on Citizen & School's Interest *For example: Schools can, choose whether to use the system or a publication to get policy data*
Primary Products of System	Reports to assist them in accomplishing their tasks *For example: usage reports or lists of Citizen requests*	Data Submission *For example: Application for aid* Reports/information

Attribute	Customer	User
		For example: Description of student loan process
System Role in Person's Focus	System Effectiveness or Citizen/School support *For example: System is just a data supplier*	Main task accomplishment tool *For example: System is the primary/only way the data is entered or accessed*

This type of feedback determines the level of satisfaction with the operational system. A generic template of Customer and User project surveys are provided as Appendix E, Generic Questions for Customer Survey, and Appendix F, Generic Questions for User Survey respectively. In order to obtain a large sample of system users quickly, the survey may be deployed online.

In accordance with the Paper Reduction Act of 1995, OMB approval is needed for all external surveys that reach ten (10) or more non-ED employee personnel. An external survey will request responses from non-ED personnel such as students, schools or vendors. In order to ensure specific metrics are collected, the Project Management and Support Team must work closely with evaluation team to review the survey questions. The Project Management Support Team has final approval over all survey questions. Survey meetings may be conducted prior to project kick-off to finalize the survey questions**.**

The approval process requires that the exact survey questions be submitted by Federal Student Aid through the CIO to OMB Information and Regulatory Affairs. Typically, the survey will be approved within 30 days, but may require additional time depending upon the survey content. Currently, there are no on-line documented procedures for OMB survey approval. Any external surveys should be planned approximately 2 months in advance of the anticipated project kickoff in order to allow time for the OMB approval process.

Interviews and Discussions - Interviews (either by phone or in-person) provide an opportunity for project staff, users and customers to discuss additional information that may not solely be obtainable through surveys, questionnaires and system documentation. However, a significant amount of time is required to coordinate, conduct and filter the results from a structured or an unstructured interview.

The evaluation team records the actual data results collected into the Appendix D, PIR Evaluation Worksheet as part of Step Two – Collect and Analyze Data. The worksheet allows the evaluation team to document the following: baseline goals, actual results, variance, and comments/reasons. This template can be modified to incorporate lessons learned from previous system evaluation efforts.

In order to successfully complete Step Two of the PIR process, the evaluation team must perform the following activities.

Interpret Project Data. An accurate interpretation of project data (planned goals and actual results) is critical. Inconclusive results may indicate a need for the evaluation team to conduct additional document research and analysis. Before the end of Step Two, if a significant portion of documentation requested by the evaluation team has not been provided, a preliminary debrief may be conducted with the Project Management Support Team. The pre-debriefing meeting allows the evaluation team to provide a status on each of the PIR evaluation areas. During the pre-debriefing meeting, the evaluation team will discuss a list of outstanding questions and request project documents that are required for the PIR process.

Deploy Customer and User Satisfaction Surveys. A thorough analysis of these surveys is necessary. If initial survey results are inconclusive, additional surveys may need to be conducted in order to provide a solid evaluation of customer and user satisfaction.   Survey results not only depend upon the feedback content but also the number of respondents. Furthermore, all external surveys for more than ten (10) non-ED personnel will require OMB approval.

In certain circumstances, the evaluation team may not need to deploy a survey. Instead, if agreed upon by the project management support team, customer and/or user feedback collected from a survey recently conducted by another party such as American Customer Survey Index (ACSI), may be used in the PIR analysis.

Relate findings to PIR objectives. The evaluation team must link findings from the review process to the purpose and objective of the PIR. The evaluation team should be driven by the original project objectives and the results discovered during review.

Prepare Draft PIR Report. The evaluation team should include PIR results in the PIR Report. The recommended format is provided in Appendix H, PIR Report Format**.** Changes to the report format may be required in order to meet the special reporting needs of a particular project or group of key stakeholders.

4.3   Step Three – Provide Major Findings and Issues

In Step Three of the PIR process, each of the assessment areas must be documented with a summary of findings that support the conclusion and recommendations of the PIR Report provided by the evaluation team.

The subsections below describe the actions that may be performed by each of the participants during Step Three of the PIR process. Table 4-5 summarizes this step of the PIR process.

Table 4-5: Step Three of the PIR Process

PIR Participant	Actions
CIO/Enterprise Quality Assurance Team	❑ Review and Final Approval of PIR Report ❑ Determine if changes are necessary to the system based on report findings
Project Sponsor	❑ Review PIR Report ❑ Determine if changes are necessary to the system based on report findings
Project Management Support Team	❑ Receive PIR Report ❑ No action necessary
Project Development Team	❑ Receive PIR Report ❑ No action necessary
Evaluation Team	❑ Deliver PIR Report

4.3.1 Chief Information Officer

The CIO, in conjunction with the business unit, reviews the results of the PIR Report as a mechanism to determine how well the operational system, as an IT investment, truly supports the organizational needs and the Federal Student Aid mission. The CIO, along with the project sponsor and management, decides whether to continue, modify or cancel the operational system.

4.3.2 Project Sponsor

The project sponsor reviews the PIR Report. Subsequently, the CIO/Enterprise Quality Assurance Team reviews the results of the PIR Report. The project sponsor, CIO and other authorized management can decide to continue, modify or cancel the operational system.

4.3.3 Project Management Support Team

The project management support team receives the PIR report, but is not directly involved in determining whether any modifications to the current system are necessary.

4.3.4 Project Development Team

The project development team also, may receive the PIR report, but is not directly involved in determining whether any modifications to the current system are necessary.

4.3.5 Evaluation Team

The evaluation team provides a PIR Report that summarizes major findings about the actual results and the process. The PIR Scorecard template that

assigns a numeric score to each area of the PIR is provided in Appendix G. A debriefing meeting is conducted by the Evaluation Team to present the findings of the PIR Report to the QA Team and the project management. These results can indicate potential problems in the evaluated areas. The PIR Report should include a scorecard that summarizes the review and determines if the project goals were achieved in each of the areas assessed.

In addition, the PIR report should identify specific recommendations for future development efforts. These recommendations are particularly important for development efforts that produce multiple product versions. For projects with major releases that require multiple PIRs, the results of each subsequent PIR will be analyzed and compared with previous PIR findings in order to track process improvement. The report is forwarded to authorized management personnel for review.

All documentation that was used by the Evaluation Team to create the PIR Report is provided to the CIO/Enterprise Quality Assurance Team (in Adobe PDF format) for archival purposes. If subsequent questions or concerns are raised about the PIR Report, the QA Team will be able to reference this supporting documentation.

4.4   Step Four – Provide Feedback and Incorporate Lessons Learned

In Step Four, the results of the PIR will help formulate recommendations and lessons learned for future projects. These findings may indicate an area of instability or an area with a potential for substantial improvement in future development efforts. Since the PIR Report quantitatively provides data on whether goals were successfully achieved and provides lessons learned, Federal Student Aid could identify trends within a project. These lessons learned help identify planning and development process improvements that can be used for future projects.

The subsections below describe the actions that may be performed by each of the contributors during Step Four of the PIR process. Table 4-4, below, summarizes this step of the PIR process.

Table 4-4: Step Four of the PIR Process

PIR Participant	Action
CIO	❑ Incorporate PIR recommendations to improve investment management process
Project Sponsor	❑ Implement functional process improvements for future efforts
Project Management Support Team	❑ Incorporate PIR recommendations to improve project management process for future projects

Development Team	❑ Incorporate PIR recommendations to improve system development process, technology, and software
Evaluation Team	❑ Incorporate PIR lessons learned and PIR experiences to improve the review process for future PIR efforts

4.4.1 Chief Information Officer CIO

The feedback contained in the PIR Report can assist the CIO in improving Federal Student Aid's project strategy. PIR Report data can support the revision of the investment management process based on the PIR recommendations.

4.4.2 Project Sponsor

The project sponsor oversees the implementation of functional process improvements for the system development efforts of future projects.

4.4.3 Project Management Support Team

The project management support team incorporates the recommendations identified in the PIR Report in order to improve the project management process for future projects.

4.4.4 Project Development Team

As a result of the PIR recommendations, the project development team can improve the system development process, technology and software used for future projects.

4.4.5 Evaluation Team

The evaluation team uses the PIR Report and activity experiences to improve the review process for future PIR efforts. PIR procedures may be modified or updated as lessons learned by the evaluation team are documented and process improvements are implemented in the PIR process. The lessons learned are incorporated into the overall CPIC process.

5 PIR Evaluation Areas

5.1 Selection of Evaluation Areas for Different PIRs

As an independent, objective review of a completed IT investment effort, a PIR serves as a fact-finding review focused on comparing the original project goals with the achieved project results and gathering any lessons learned to improve the success of future IT investment projects. A PIR identifies the impact of the project on the Federal Student Aid's mission and the intended user groups. In addition, a PIR should document any requirements or original project goals that were not met by the IT effort being reviewed. Also, a PIR report should describe any process concerns, such as breakdowns in intra-group communications, inappropriate decision making, or ineffective management activities that detracted from the IT efforts success level.

PIRs can be performed on several different kinds of projects. Any investment that relates to an IT initiative and is supported by a business case and task order can be chosen for review. Following are project types that have undergone PIRs in the past.

System Development– The most common kind of IT project that has undergone a PIR is the development of a new system, such as a web site or standalone application.

Software Development – An initiative may create a new piece of software that operates within a larger system framework. For instance, a form that will be accessed, completed, and delivered using a Federal Student Aid web interface. In this case, some, certain sections, such as Technical Architecture or Security, may be out of the scope of the review. In general, each core section should be addressed unless there is clear documentation indicating that the activity is performed within the scope of a different initiative.

System Maintenance – An IT initiative may focus on the support of an existing system. Typically, these types of IT investments are funded at a fixed or flat rate per period of performance (e.g. month, quarter, and year).

Environment – IT investments may support or upgrade hardware that is used to support other Federal Student Aid networks, web sites, or systems. The hardware used to support a system resides in an environment. An environment can be defined as an integrated technical architecture or technical support environment, such as the Virtual Data Center.

Process Re-Engineering or Visioning Effort – Significant funds may be invested in order to evaluate a business process and create a vision for future

changes. Although no IT system hardware or software results from this effort, a PIR may be conducted to determine whether the planned documents and guidelines have been adequately researched and presented, based on the goals discovered in source documents.

5.2 Evaluation Areas

The following sections describe each of the evaluation areas that ED has used in previous PIRs. Regardless of the type of PIR being conducted, the review should begin by considering the potential evaluation areas. When considering the documentation available for each evaluation area, the PIR evaluation team should assess the applicability of each of the sections to the individual project. The evaluation areas can be altered, removed or additional areas created as dictated by the specific PIR. The following table summarizes the evaluation areas. For each project type, the table indicates which sections should be carefully considered for possible omission or replacement.

Table 5-1: Evaluation Area Summary

✓ = applicable sections O = areas for further review		PIR Types				
Evaluation Area	**Evaluation Area Description**	**System Development**	**Software Development**	**System Maintenance**	**Environment**	**Process Re-engineering/ Visioning**
Business Case & Vision Planning	Determines whether the implemented system has achieved its proposed outcome and has provided the desired benefits in support of the Federal Student Aid's mission and goals.	✓	✓	✓	✓	✓
Functional Requirements Versus Implementation	Determines if the system delivered the right products and services according to the customers' specifications and users' needs	✓	✓	O	O	O
Product Performance Metrics	Provides an overall picture of how successfully a system implements the process improvements to speed or capacity capabilities.	✓	✓	✓	✓	O
Data Framework	Defines the outline for the implementation of a safe, accessible and quality data environment from which one or multiple systems may access.	✓	✓	O	O	✓
Capacity Analysis	Undertaken in order to verify whether a system, usually hardware, will be able to handle the proposed changes.	O	O	✓	✓	✓

= applicable sections O = areas for further review		PIR Types				
Evaluation Area	**Evaluation Area Description**	**System Development**	**Software Development**	**System Maintenance**	**Environment**	**Process Re-engineering/ Visioning**
Data Architecture	Focuses on the physical data architecture, organization, approach models and software tools that allow Federal Student Aid to manage its own data.	✓	✓	O	O	✓
Security	Ensures that a complete security plan was developed, implemented and enforced.	✓	O	O	✓	O
Risks and Risk Mitigation	Validates that all system risks have been identified and that individual risks have either been mitigated as they have occurred or that a plan exists to manage significant issues as they rise in criticality.	✓	✓	✓	✓	✓
Technical Architecture	Ensures that the technical architecture provides a sound, stable execution and foundation that fully supports Federal Student Aid's business functions.	✓	O	✓	✓	O
Cost	Assesses whether the project was completed within planned budget	✓	✓	✓	✓	✓
Schedule	Assesses whether the project was executed within the scheduled timeframe.	✓	✓	✓	✓	✓
Customer & User Satisfaction	Surveys are conducted to gauge whether the project was completed to the satisfaction of the final customers and users.	✓	✓	✓	✓	✓
Process Improvement and Innovation	Measures whether the planned innovations meet industry standards and provide needed enhancements.	✓	✓	O	✓	✓
Project Lessons Learned	Determines whether lessons learned have been clearly documented throughout the life of the project.	✓	✓	✓	✓	✓

5.2.1 Business Case & Vision Planning

An assessment of the implementation of the goals described in the Business Case and Vision Documents will determine whether the implemented system has achieved its proposed outcomes and has provided the desired benefits in support of Federal Student Aid's mission and goals. The Business Case and Vision documents strategically outline components of the mission and Federal Student

Aid 's long-term goals. Ideally, the associated project will achieve these components and thus, further the progress of Federal Student Aid. The PIR evaluates this area to confirm the project's success in contributing to the overall Federal Student Aid progress.

Strategic project documents, such as a concept of operations, business case, and vision documents, should provide a high-level description of the proposed system. The concept of operations document typically provides an overall description of the system's quantitative and qualitative characteristics. In addition, the concept of operations describes the organizational objectives and user community from an integrated systems point of view. The Business Case describes why the proposed system is an appropriate investment, through cost-benefit analysis. A vision document describes how the system's intended objectives and capabilities are expected to support Federal Student Aid 's mission. These documents are usually prepared by the Project Sponsor or the Project Management Support Team prior to Functional Requirements Specification.

Effective strategic planning includes documenting an overall timeline and schedule that indicate the milestones to be achieved during the system development effort. Even though adjustments to the schedule may be necessary to support the development effort, original goals provided in the strategic documents should be reasonable and obtainable.   As such, practical strategic alternatives to the planned initiative, with associated risks, also should be defined. In addition, strategic investment management should identify system development costs allocated for activities, such as quality assurance, security assessment, and training. The strategic planning documentation should identify primary goals of the system, a general development schedule, and an estimated budget.

The Investment and project management process begins with a clear understanding of the purpose, scope and benefits of a proposed initiative. Documentation providing the strategic mission, business case, and description of the proposed system should be developed. All strategic goals should be aligned with Federal Student Aid 's mission.

In order to assess the impact of the system development effort on the business case and vision planning, the evaluation team first should collect a concept of operations, business case, and vision documents. These strategic documents should be reviewed to determine if they are consistent with Federal Student Aid's mission and objective. Once the overall goals are discerned, the evaluation team should seek documentation that supports those goals.

One important document for assessing the Business Case evaluation area is the Production Readiness Review (PRR). A PRR can be used to indicate whether

the vision goals have been met. In addition, the PRR outlines the activities undertaken throughout development; therefore, the evaluation team can use the PRR as guidance to identify other documents that may be available for review.

Any deviations from Federal Student Aid's mission should be explained and thoroughly documented. These documents should be reviewed to determine if the budgetary goals and system development milestones were successfully achieved. Therefore, the evaluation team should determine if the expected benefits were realized by comparing the actual impact of the system to the envisioned impact. Comments from the PIR Satisfaction Survey can help to verify that improvements have been realized. The PIR Report should include how the strategic planning affected the success of the project and how the implemented system impacted Federal Student Aid's mission.

5.2.2 Functional Requirements versus Implementation

For the functional requirements versus implementation assessment area, the evaluation team needs to determine if the system delivered the right products and services according to the customers' specifications and users' needs. Functional requirements are an important assessment area because they define the system data requirements and processing requirements of the customers and the users. These requirements represent the baseline specifications and determine the basis for development activities. The baseline requirements should be compared against the functionality of the implemented system in order to determine if the originally defined system was developed.

Project documents, such as the concept of operations, system requirements document, detailed design documents, and requirements traceability matrix (RTM), capture functional requirements. The concept of operations can provide a high-level system description of the planned system and proposed system interfaces. Specific functional requirements and designs can be provided in a system requirements document and a detailed design Document, respectively. All functional requirements should be tracked in an RTM that contains a detailed list of product functionality.

Each item in the RTM should clearly and unambiguously define a system feature. For example, a requirement may state, "The system shall be web enabled." Within the RTM, this requirement needs to be tracked through the design, development and testing phases, in order to verify that the system development effort was driven by the requirement. Each requirement must be clear, concise and testable. Thus, the requirements should be understandable to the development staff, as well as the customers and users. In addition, each requirement should represent one specification and not a composite of multiple requirements. Furthermore, each requirement must be specified in a testable

manner that can be used to discretely determine if the requirement was achieved.

For the PIR process, the evaluation team collects and analyzes functional requirements data through documentation review and an independent assessment. First, the evaluation team reviews the project development RTM and performs a requirements mapping. When all phases of the system development effort are well documented, the baseline requirements can be directly traced to the design, development and testing documentation. In addition, with a complete RTM, the existence of the functionality defined by the requirements can be quickly verified in the actual system implementation.

If an RTM has not been adequately updated or maintained for each of the phases, the evaluation team might attempt to trace the partial requirement mapping against the system's functionality. If an RTM has not been developed, the evaluation team may be asked to perform an independent requirements traceability review of the functional requirements document to current functionality of the implemented system. This will determine not only if requirements were adequately documented and tested, but that the stated requirements also were successfully implemented. Any requirements not traceable through the implementation phase should be identified by the evaluation team in the PIR Report, because this may indicate that the development process did not achieve the originally desired system functionality.

5.2.3 Product Performance Metrics

Performance metrics provide an overall picture of how successfully a system implements the process improvements defined at the outset of the development effort. IT projects are generally intended to process information more quickly or handle larger numbers of users. Performance metrics provide a way to verify that the development effort has met these goals. By verifying product performance metrics, the actual performance of the project can be methodically and carefully compared with the objectives stated when the effort began.

Often, original baseline performance goals can be found in the business case. In addition, system development documents, such as the functional requirements document and the performance plan, should provide detailed performance goals and measures that are updated as the project progresses. The final product performance metrics should consist of operational performance data found in the performance test results.

These metrics should describe technical performance factors, such as system performance, response times, storage capabilities, and data integrity. When compared against the original baseline goals, performance metrics should indicate whether the system has produced the specific operational benefits it was

intended to provide. Also, important to assess is whether the documentation adequately addresses performance issues, such as defining acceptable performance levels, identifying required interfaces, and establishing testing standards. Likewise, performance goals should be clearly stated with metric gathering techniques that are well defined and thus, minimize the ambiguity in determining whether the IT investment is a success.

The development and testing teams should create a detailed performance testing plan. Test scripts that clearly measure the performance goals should be created and executed. The PIR evaluation team will determine whether appropriate methods to measure key product metrics were outlined early in system documentation, as well as whether these performance measures were correctly used to measure the performance goals. In addition, the evaluation team may conduct customer and user surveys to collect utilization-based information. The evaluation team will compare the performance testing plan with the finished test results and will analyze the information to verify that project goals and objectives have been met.

5.2.4 Data Framework

This evaluation area is similar in scope to the technical architecture evaluation area defined below. A data framework defines the outline for the implementation of a safe, accessible and quality data environment from which one or multiple systems may access. Typically, a data framework is comprised of several strategic focus areas. These focus areas define the methods of how data will be formatted and transported, how the data will be defined, what the contents of the data will consist of, how the data will be managed and whom will own the data. The four evaluated areas to ensure a quality data framework are defined below.

Data Access Methods – These methods are the top layer of a framework. They define and standardize the format and transportation of data to ensure consistency throughout an enterprise. To ensure the correct data access methods are defined, three specific areas should be reviewed:

- Methods for internal and external data exchange
- Services which provide data access
- Methods to access data, (i.e. Portals, Website)

The data access methods are typically defined in documents, such as a data framework specification, web service strategies, and external information access.

Data Standards – This area should define the meaning and content of data. The standards define the guidelines for how data is defined and represented.

Data Quality – This area should define the quality of the data housed by the framework. The main focus of this area is data accuracy and consistency throughout Federal Student Aid. To ensure that strong data quality measures have been taken, three areas should be investigated:

- Data Correction Services
- Reconciliation Services
- Audit Services and Analytics

To ensure that data quality is properly defined documents such as a Data Framework Specification, Quality Assurance Strategy, Implementation Plan, Data Storage, Management and Access Strategy, as well as a Technology Vision and Strategic Plan.

Data Ownership – This area reviews the business processes and data owners who will be the stewards of that data throughout the life of a specific system. This evaluation area also reviews the process of identifying the systems that will be the caretakers of data during specific life cycles as data entities enter progress and leave the Federal Student Aid business processes. To ensure this focus area meets its goals the following will be specifically reviewed:

- What is the source or originating system of the data component?
- Where and when will full or partial copies of data components exist?
- Who passes the data component and for what purpose?
- Who stores the data component for future use?

Information regarding data ownership is usually delivered primarily in system data flows, data framework specification, and quality assurance strategy and implementation plans.

5.2.5 Capacity Analysis

This evaluation area is similar to the product performance metrics evaluation area. IT projects are generally intended to process information more quickly or handle larger numbers of users. In many instances the creation or development of an environment deals directly with this issue. A capacity analysis is undertaken in order to verify whether a system will be able to handle the proposed changes.

Specifically, this capacity analysis helps to determine the appropriate configuration and bandwidth of a network environment. This analysis also measures the probability of successfully implementing the process improvements recommended in a business case. The results should be an analysis of existing data capacity and utilization, anticipated use, and the recommendations of

server, database, and application vendors. These results will determine appropriate initial hardware sizing. Also, a capacity analysis shall help to determine the appropriate configuration and bandwidth of a network.   The PIR Evaluation team verifies how closely the capacity analysis covers the intended performance issues identified at the outset of the project. This test is usually inclusive of a performance test.

5.2.6 Data Architecture

This evaluation area focuses on the physical data architecture, organization, approach, models and software tools that allow Federal Student Aid to manage its own data. This evaluation should ensure that the components, both technical and tactical are defined well enough to enable the functional use, protection and interpretation of data throughout Federal Student Aid. Most commonly, a data architecture is broken into two focus areas:

- Physical Architecture
- Data Organization and Management Architecture

The physical architecture is similar to the security evaluation area. Physical architecture deals with the security measures implemented to provide authentication, encryption, authorization, access, and privacy of data within the implemented environment. It is a critical part of the data framework and is often addressed by a separate, closely integrated initiative that is focused on designing a technical security architecture tailored specifically for Federal Student Aid. The data organization and management architecture provides the definition of the data itself, including metadata.

5.2.7 Security

At a minimum, Federal Student Aid IT initiatives should meet all controls that are consistent with government-wide policies, standards and procedures according to OMB security guidelines. During a security assessment, documentation should be analyzed to determine whether the implemented system complies with Federal Student Aid's security standards and procedures, as well as government-wide policies. In addition, the National Institute of Standards and Technology (NIST) provides security guidance for federal departments and agencies. The guidance is consistent with federal mandates affecting contingency, continuity of operations, and disaster recovery planning. Thus, NIST guidelines are consistent with OMB security requirements.[2]

This analysis is performed to ensure that security documentation, such as a security plan, are developed, implemented and enforced. In addition, security

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[2] National Institute of Standards and Technology Special Publication 800-34, Contingency Planning Guide for Information Technology Systems, p. 3.

compliance also, can be evaluated based on what corrective actions were performed when responding to reported security incidents. Thus, the evaluation team will determine whether corrective actions were clearly documented and immediately enacted after security problems were identified.

According to the OMB Circular No. A-130, Appendix III-Security of Federal Automated Information Resources, security controls should be applied to all agency information collected, processed, transmitted, stored, or disseminated in information resource (e.g. information and information technology) areas. These resource areas are categorized as either a general support system or a major application. Definitions of these information areas are provided in Table 5-2, below.

Table 5-2: Definitions of Information Resource Areas [3]

Information Resource Areas	Definitions
General Support System	An interconnected set of information resources under the same direct management controls which shares common functionality. This would include hardware, software, information, data, communications, and people.
Major Application	Critical information resource that requires special attention to security due to the risk and magnitude of the harm resulting from loss, misuse, unauthorized access or modifications of information in the application.

The OMB Circular No. A-130 defines specific controls that should be incorporated into a general support system and a major application. For each information resource area, the PIR evaluation team should review specific planned and implemented security controls to determine if adequate security controls exist. For a general support system, specified security controls that are recommended by OMB, as well as a description of each control, are provided in Table 5-3, below.

Table 5-3: Controls for General Support System

Control	Control Description
Assignment of Security Responsibilities	For each system, the security responsibility should be assigned to an individual trained in the technology used in each system, including the management of security controls such as user identification and authentication.

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[3] Office of Management and Budget Circular No. A-130, Appendix III - Security of Federal Automated Information Resources, February 8, 1996.

System Security Plan	The System Security Plan outlines the necessary measures to safeguard confidential system information and the system, itself. At a minimum, a System Security Plan should assure data integrity, availability and confidentially by including the following: • <u>Rules of the System</u>. A clear delineation of responsibilities and expected behavior for all individuals that have access to the system. • <u>Training</u>. The provision of mandatory and periodic training in how to fulfill their security responsibilities as individuals with access to the system. • <u>Personnel Controls</u>. The screening of individuals who are authorized to bypass significant technical and operation security controls. • <u>Incident Response Capability</u>. The existence of formal incident response and incident handling mechanisms. This includes a provision to share information about potential threats and common vulnerabilities to other systems and agencies. • <u>Continuity of Support</u>. The existence and periodic test of a Disaster Recovery Plan. The Disaster Recovery Plan describes the process to be implemented in case a catastrophic event interrupts current security measures and system operations. • <u>Technical Controls</u>. Controls to ensure that effective security products and techniques are appropriately used within the system. • <u>System Interconnection</u>. Establishment of controls for systems that have access to and from other systems. The number of controls will depend on the degree of how connected the system is other systems.
Review of Security Controls	Security review should occur after significant modifications are made but at least every three years. This includes a periodic review of management, operational, personnel and technical controls.

Additionally, there is a set of security controls required for major applications that are recommended by OMB Circular No. A-130. Therefore, the PIR evaluation team should determine whether these controls have been also clearly documented and implemented. Specified controls for major applications, as prescribed by OMB, are provided in Table 5-4, below.

Table 5-4: Controls for Major Applications

Control	Control Description
Assignment of Security Responsibilities	Responsibility assignment for security of each major application to an individual knowledgeable in the nature of the information and process supported by the application.
Application Security	For adequate security of each major applications, the application security plan should include the following: • Application Rules. Establish responsibilities and application rules for all individuals with access the application. • Specialized Training. Ensure individuals receive specialized training focused on their responsibilities and the application rules. This includes specialized training. This may be in addition to the training required for access to a system and tailored to what a user needs to know to use the application securely. • Personnel Security. The screening of individuals that focuses on the use of controls for individual accountability, separation of duties, as well as restricting their user's access to the minimum privileges in the application necessary to perform their job. • Contingency Planning. The establishment and periodic testing of an application to perform expected functions in the event of unplanned application failure. Contingency Plan provides alternative procedures to planned events and activities in order to perform risk management. • Technical Controls. Ensure appropriated security controls are specified, designed into, tested and accepted in the application. • Information Sharing. Ensure that information shared

| | within and from the application is adequately protected. |
| | • <u>Public Access Controls</u>. If public access to the application is permitted, additional security controls should be implemented. |

This evaluation area ascertains if adequate security measures for general support systems and major applications were devised and thoroughly tested to protect student and other users' data.

Thus, the PIR evaluation team should examine security requirements, implemented procedures and corrective actions to determine the level of compliance to Federal Student Aid and Federal security standards and policies. These policies are documented in the Federal Student Aid Information Security and Privacy Policy provide a foundation for various information security guidelines, standards, processes and procedures that serve as the criteria to which measurements are determined.[4] As such, these policies define the security requirements for Federal Student Aid assets, personnel, facilities and contracted resources. Any exceptions to these policies should be documented and approved by high-level management and the project sponsor.[5] Documentation of exceptions will provide the evaluation team an explanation of variances between security goals and measurements.

In addition, the evaluation team should collect the results of system penetration testing which will identify potential system weaknesses that may exist. Traceability of remedial actions to reported security incidents should be documented and clearly mapped to resolution. Likewise, lessons learned from security activities should be captured and applied to future IT efforts. Overall, security documentation created during planning, testing, operations and maintenance activities should be examined.

Irregardless of whether the IT project involves an enterprise-wide framework, specification or a system and application development project, security project artifacts should be published by the project development team. These project artifacts become especially important for IT efforts that result in a Federal Student Aid system being hosted at a vendor location rather than a Federal Student Aid facility. In this instance, security documentation may be deemed confidential and proprietary. However, a general assessment of vendor security procedures, such as periodic security risk assessment should be clearly documented, without disclosing specific security details.

In summary, a comprehensive security review includes a review of planned security mechanisms, as well as implemented security controls that are currently

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[4] Federal Student Aid Information Technology Security and Privacy, April 2003, p.6
[5] Ibid. p. 7.

deployed. Security goals should be provided in security project documentation though they may originate in the Business Case or Concept of Operations document. These goals concerning the security measures should cover the design, development, testing and administration of the system development effort. Then, a thorough security analysis should compare the security measures against security testing results documentation.

Security goals should be reviewed to ensure that they are aligned with to document how well the system achieved its original security goals. These security measures need to be reviewed against Federal Student Aid's security handbook and federal standards and policies. Next, the evaluation team should review any deviations from these security standards, as well as any documentation that provides an explanation for the change. Finally, all documented remedial action performed for any security problems should be reviewed and lessons learned incorporated into future IT efforts.

5.2.8 Risks & Risk Mitigation

The purpose for a risk management analysis is to validate that all system risks have been identified and that individual risks either (1) have been mitigated as they have occurred, or (2) that a plan exists to manage significant issues as they rise in criticality. Risks can include internal and external factors that may affect the successful completion of the project. Risks can occur at any stage of the development process from planning through implementation. Considering whether risks were anticipated, how they were documented, and whether strategies were developed to mitigate the potential risks is important to system stability.

The risk mitigation process can provide valuable insight as to why a project may not have met its goals. A deficiency in risk management can indicate ways to improve the investment process. Likewise, a strong Risk Management Plan can help to achieve positive functional results even when risks are present. To ensure that risk is anticipated and to support an effective mitigation process, a Risk Management Plan should be drafted early in the project. This document lists the known risk factors and outlines actions to be taken in the event that risk scenarios come to pass.

Anticipated risks also may be found in project documents such as the Business Case, Disaster Recovery Plan, and Contingency Plan. In addition, there should be a risk capture mechanism to show when risk factors have been encountered and what actions have been taken as a result. Change documents may provide valuable information on actions taken in response to risk factors. For instance, an Engineering Change Proposal could address mitigation of risk concerning a specific hardware component selection in the technical architecture and a

Schedule Change Document could identify and diminish risks in meeting completion dates on the project.

Information concerning the risk management process should cover all areas of risk mitigation: anticipation, strategy and implementation. Ratings will take into consideration whether all potential risks to the project were anticipated or whether obvious risk areas were ignored. For those areas of risk that were identified, the risk mitigation strategies should be studied to consider whether the action plan is appropriate to the level of risk. Another measure of successful risk mitigation is to consider how actual risk events are addressed when risk factors are encountered. An evaluation should discover whether the Risk Management Plan was followed, and if so, how successful the recommended actions were at alleviating problems or minimizing delays.

As part of the initial project establishment, the project management team should define, introduce and encourage use of a risk tracking mechanism. This could be a documentation-based process, a standalone software product or tracking tool, or it could be a method that links directly into project management software that is in use to support the development planning. This type of tool can facilitate keeping a written record of risks as they are identified.

In addition, potential mitigation options can be described before risks occur and resolutions can be documented along with implementation outcomes of the selected mitigation option(s). The tool also should systematically relate individual solutions to additional risk areas that might benefit from them. In fact, multiple solutions to each risk could be identified and prioritized for a multi-layered approach to risk mitigation. Documentation of risks and risk mitigation activities not only increases the project's potential for success, but also creates an experience history from which other projects can benefit.

The evaluation team first must identify and review the Risk Management Plan and the Change Documentation. A thorough risk management analysis then should compare the initial plans with any actions taken during the course of the project. Delays in the project schedule or budget will be researched to determine whether or not they were anticipated in the risk management process, and whether actions taken were in line with planned strategies. The PIR Report should include the impact, if any, that each risk and its management had on the success of the project.

5.2.9 Technical Architecture

The technical architecture of the system needs to be carefully planned and designed to ensure that it will support the application or systems to be developed. A technical architecture needs to establish that all interfaces, processes and system components are compliant with currently prescribed

industry and ED Federal Student Aid standards and procedures. This is important because it ensures that the technical architecture provides a sound, stable execution and foundation that fully supports ED's business functions. The implemented system will be evaluated on the deployed production technical architecture.

The technical architecture defines the technical requirements, constraints and standards that will be used to support system functionality, as well as optimal performance. During a technical architecture review, the PIR evaluation team should perform activities, such as:

- Determine if adequate planning and design of the system's configuration were clearly documented.
- Determine whether the technical architecture aligns with Federal Student Aid Enterprise Architecture.
- Determine if the implemented system is consistent with the planned architecture goals.
- Determine if any discrepancies between the implemented architecture with the planned architecture goals were clearly documented.
- Determine if the resources and technologies used completely follow the prescribed standards.
- Determine if the technology used is sufficiently interoperable and compatible with the current infrastructure and environment.

These activities are consistent with the guiding principles cited in the Federal Student Aid Technology Policies, Standards, and Products Guide, dated August 2003, and the Federal Student Aid Technology Architecture (TA). The TA provides the framework of principles and practices that direct the design, construction, deployment and management of information technology and systems. The guiding principles are:[6]

- The Architecture must support the business.
- Reengineer business processes and supporting IT together.
- Enhance and simplify access to information.
- Design integration and reuse into IT initiatives.
- Use industry-proven technology.
- Maintain vendor neutrality.
- Solution preference based on cost effectiveness and benefits.
- Architecture enforcement and compliance to the Federal Student Aid Enterprise Architecture and Common Operating Environment.
- Period architecture review, structure maintenance and technology refreshment process.

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[6] Federal Student Aid Technology Policies, Standards and Products Guide, version 4.0, August 1, 2003.

The Federal Student Aid Technology Policies, Standards and Products Guide also provides a list of target standards listing products currently used by Federal Student Aid and projected for future use, as well as the approved type of standard. There are standards for service areas such as:

• User Interface Services	• Network Services
• Application Services	• Operating Systems Application Development
• Enterprise Data Management	• Systems Management
• Distributed Computing	• Security Services
• Data Interchange	• External Environment

The technical architecture of the system should be detailed in final deployment documentation including the operator or administrator's manual. These technical architecture documents should describe the physical layout of the system, as well as the reporting, processing and storing capabilities of the system. In addition, the mechanisms to facilitate changes to the technical architecture should be documented. Engineering Change Request forms represent modifications to the previously proposed technical specifications of the system. Thus, the change requests may have identified potential risks in the system's architecture and may describe how these risks were mitigated with adjustments to the technical architecture.

Technical architectural goals are applicable to the development, testing and production environment. These goals could include the metrics concerning processing speed and capacity of the system. For example, the transactions processed per second and the maximum number of simultaneous users should be quantifiable goals that can be tested after implementation is complete. This evaluation area should compare the original metric goals to the testing results.

In addition, the infrastructure should quantify security needs, such <u>as</u> the use of firewalls to control user access, or data classification support to protect private information. Likewise, a detailed list of hardware devices and application components should describe the proposed environment for which the system should be developed. A detailed and fully documented technical architecture, not only helps in the implementation and production of the system, but also provides guidance to future iterations of the system.

The project development team should specify the technical architecture by developing documentation including network diagrams that illustrate the configuration and topology of system equipment (e.g. databases, firewalls, client and server stations) for the testing and production environment. Likewise, architecture connectivity models should be produced that document the relationship between the functional flow of system interfaces and components. For example, the functional relationship between an application server and a web

server should be documented. These technical architecture diagrams also may provide descriptions explaining why specific technical design decisions were selected over other alternative infrastructure designs.

A technical architecture can contain sensitive information and affect security considerations. Furthermore, for systems that are hosted by a vendor outside a Federal Student Aid facility, access to the technical architecture documentation may be restricted. Under those circumstances, the vendor may elect to establish a written agreement to permit close examination of the implemented architecture by the evaluation team. As another option, high-level technical architecture documents, such as a completed architecture implementation checklist, could be reviewed by the evaluation team without disclosing sensitive technical details.

In summary, in order to assess the system's design, the evaluation team should collect and review all available documentation pertaining to the final implemented technical architecture. The original Technical Architecture Plan should be compared against the implemented system, in order to determine if there were deviations from the original requirements. A PIR assessment also should determine whether all of the system components integrate with the current infrastructure. Furthermore, the implemented system needs to be reviewed to assess if the operational system adheres to Federal Student Aid 's standards and policies, as well as to industry standards. A thorough technical architecture analysis should compare any corresponding actions taken to modify the technical design. The changes in the system design should be researched to determine how they significantly impacted the success of the project.

5.2.10 Cost

One of the clearest measures of a project's success is whether the project met its financial goals. Cost provides an unambiguous gauge of whether an IT investment was worth the time and effort. Analysis of cost can be as simple as comparing the overall budget to overall expenditure, or it can be broken down to consider more detailed costs and items, such as those involved with oversight of the project. Additionally, post implementation expenses defined by a project's contract method, like Share in Savings (SIS), can be included in the PIR. Increasing the depth and scope of the cost evaluation can increase the benefit gained from the effort.

To determine the efficiency of a program, initial cost goals and budget information should be compared against actual lifecycle costs and returns. A project budget plan should define financial goals for each phase of the project, and financial documentation should record expenditures. For example, if project management or Independent Verification and Validation (IV&V) costs are to be included in the review, the personnel providing the specific support to the project should provide documentation of the costs involved with their individual

contributions. Likewise, when additional considerations are made for post implementation expenditures, such as SIS, costs should be classified, tracked and handled by a project management support team, or an SIS analysis team.

Baseline cost goals should be clearly stated, with each goal mapped to a specific line item or a period of performance phase in the development effort. Any changes to the original cost goals should be clearly documented through Cost Change Request documentation. Budget planning can include program management costs, hardware and software systems administration, and quality assurance activities, such as IV&V. When SIS, or similar style contracts are involved, an independent analysis team, not the PIR evaluation team, should be responsible for providing an official report outlining realized savings and resulting fees paid by Federal Student Aid.

A detailed budget plan should be formulated at the start of the project, by the project sponsor or the project management support team. That detailed plan should clearly outline individual goals and assigns responsibility for meeting budgeted figures. The budget change approval process should provide a written record of all budgeting decisions along with explanations for any variances to the budget plan. Federal Student Aid utilizes an Investment Planning Council (IPC) to manage and approve all investment modifications.

The evaluation team will collect the relevant documents including initial and final cost plans along with all cost change documentation. The evaluation team will examine the differences between estimated versus actual investment costs and returns.   Detailed explanations will be sought for any deviations from the original cost plan through document review, surveys and project personnel interviews. When changes to project cost are unexplained, the evaluation team should contact project management and ask about the discrepancy. In some cases, memorandums, meeting minutes, or email correspondence can be used to document reasons for changes to the initial plan. The PIR Report will describe the overall effect of cost changes on the project and identify areas where the budget management process could be improved for future efforts.

In government environment, an initial cost data shown in the project plan for initiating a new system, a system enhancement or a new project, the cost data as shown in a business case could be two or three years old by the time the system development or the project has started. Within this time span, the government budget formulation processes could incur changes to the original plan as shown in the original business case. Therefore, for PIR purposes, the cost evaluation should be based on cost data obtained from the FSA CFO Budget Group, which oversees the official data (system of record). The PIR evaluation team will use this revised cost data for PIR evaluation baseline.

In evaluating the cost area for PIR, the funds for the project that were beyond the control of the project team, such as funds were automatically taken off by the budget office for some reasons or de-obligated and returned to the U.S. Treasury Department, should not be negatively assessed.

5.2.11 Schedule

Effective schedule management can be a critical element of project's success. A poorly planned schedule can result in missed milestones that cause an entire project to fail. Unnecessary schedule changes can impact all aspects of a project from cost to product utility; a significant delay can cause the final product to be obsolete or useless to its primary customers. Careful planning in the Select Phase of the CPIC process and careful tracking of changes to a project's schedule during development are important to successful completion of the project. Recording the impact that any changes have on the project as a whole provides insight to the development effort and may reveal lessons learned.

The project plan should contain the original project schedule. In addition, a schedule change tracking mechanism should be implemented at the start of the project to easily identify any changes and to make re-scheduling possible. At the close of a project, a Final Project Schedule should be generated for comparison purposes. Mechanisms to facilitate changes to the schedule should be in place at the start of a project such that all schedule change requests are clearly documented. Potential risks to the original schedule should be anticipated, along with strategies for managing any necessary re-scheduling. These risk factors and strategies may be outlined in a risk management plan, contingency plan, or disaster recovery plan.

Ideally, an IT project follows the original schedule with no deviations, and each milestone of the project is completed as anticipated. While this is the goal of every project, planning for potential risks to the schedule is necessary and supports the making of day-to-day decisions that affect each milestone. A high rating in this evaluation area starts with a well thought-out and well-implemented initial schedule, with reasonable milestones that do not require planned workload stress. However, it also entails careful tracking of schedule changes, with no unexplained or erratic changes. Effective schedule management anticipates risks and provides a plan for handling missed milestones, including what considerations should be given to how unexpected events are handled and documented for minimum impact on project completion.

One of the initial steps to managing a project should be to establish a realistic, detailed schedule. An effective schedule should highlight significant milestones and clearly define the duration of each implementation phase. Development activities should be clearly assigned to a specific phase of the effort. Further

detail should be provided by breaking down each activity to individual tasks that can be assigned to groups or even to specific personnel. By making such assignments, the project manager can plan to have adequate personnel allocated to the project without over-planning available staff.

The evaluation team will collect the relevant documents including initial and final project schedules along with all schedule change documentation. The initial project schedule will be evaluated against final project completion dates. Detailed explanations will be sought for any deviations from the initial schedule through document review and survey and interview techniques. When changes to the project schedule are unexplained, the evaluation team should contact Project Management and ask about the discrepancy. In some cases, memorandums, meeting minutes, or email correspondence can be used to document reasons for changes to the initial plan. The PIR Report will detail the overall effect of schedule changes on the project and make recommendations on how the schedule management process can be improved for future similar efforts.

5.2.12 Customer & User Satisfaction

The PIR process is designed to ensure that the operational system supports the end users and customers of a system as intended. Therefore, customer and user satisfaction is an important measure of a project's overall success. The PIR should detail how these groups rate elements, such as perceived benefits of the system, level of service, overall utility, and concerns about data integrity or system security. In addition, a thorough understanding of how users and customers view a system and its usefulness can provide valuable lessons that help to continually improve the system.

5.2.12.1   Survey Recipient Definitions

The initial step in the survey process is to clearly define the customers and users that will participate in the survey. Each individual project will have unique kinds of customers and users that interact with a system. The PIR evaluation team should meet with project management to determine which groups will be asked to participate in the PIR satisfaction survey and answer the following questions:

- How do the individual respondents interact with the system?
- Can all respondents be asked the same set of questions, or is there a logical division?
- How many separate types of groups should be surveyed?
- Are the respondents internal ED employees or are they external to Federal Student Aid?

In general terms, a user is a person who interacts with the system's interface on a regular basis and physically manipulates system data. A user might be a financial institution that must use the system being reviewed to report student loan activity. Alternatively, a customer utilizes the data generated by the system. Using the above example, the customer might be a Federal Student Aid financial analyst who collects and analyzes the financial information provided by the individual users.

In a given system, these roles may overlap or definitions may include different kinds of users or a broader subset of interactions with the system. The evaluation team needs to confer with the project management and project development teams to arrive at a clear understanding of all customers and users of the system.

5.2.12.2   Determining Satisfaction Goals

The Business Case or Vision document describing the overall project should provide a clear set of goals for both customers and users. The goals stated in the Vision document identify areas that require detailed metrics. These goals should be considered when the survey questions are written. Generic Customer and User Surveys have been outlined in Appendices E and F of this document. These generic surveys provide a good base of information; however, individual projects might require that the surveys be tailored to include specific metrics necessary for accurate measurement of project goals.

Specific measures of satisfaction might include whether the system has improved interaction among business areas in terms of communication or quality of shared data. Opinions should be gathered concerning the presentation of the data; whether the information is presented in an acceptable manner and is easy to gather or manipulate. Customers' and users' perceptions should be compared against measured system performance to gauge whether planned response times in fact meet the needs of the system users.

Once the PIR Evaluation team has met with Project Management to determine their survey goals, the surveys can be drafted. Although the PIR team should facilitate this process, the survey questions, ultimately, should be approved by the Project Manager.

5.2.12.3   Survey Deployment

Once the survey recipients have been defined and the survey questions drafted, the PIR Satisfaction survey is ready to be deployed. Typically, surveys are distributed via the Internet using a blind, restricted survey. A restricted survey is designed to protect the privacy of the participants, allowing them to answer freely without fear of retribution. However, should individuals have trouble accessing

the system, a blind survey allows only survey technicians to link a password to a specific customer. This information is only accessed upon the request of the participant and is not collected or reported in the PIR.

Project Management is responsible for providing a list of names and email addresses of all survey recipients. In order to increase participation in the survey, project management will contact survey recipients before the survey is deployed. By sending an email to survey recipients from a familiar entity asking for their participation, the likelihood that recipients will respond is increased. When necessary, the surveys can be distributed by traditional paper collection methods. In addition, the evaluation team may choose to interview certain key users or customers to get a more complete picture of overall satisfaction.

The customer satisfaction survey using American Customer Survey Index (ACSI) is also applicable to PIR in the evaluation of customer and user satisfaction. The ACSI, established in 1994 at the University of Michigan, is a uniform, cross-industry measure of customer satisfaction with U.S. products and services, available to both the private and public sectors. It has been a standard metric in government since 1999. The benchmarking of its results can be compared against other government agencies or industry sectors.

### 5.2.12.4	Reporting Survey Results

Survey findings should be compiled, statistics analyzed, and findings detailed in the PIR Report. The PIR should clearly define the survey groups as defined prior to deployment. In addition, information regarding the total number of survey recipients and the overall response rate for each group should be reported. Finally, each survey question should be analyzed in detail.

A straight statistical analysis should be performed on each individual question. This involves measuring the percentage of recipients that responded favorably or unfavorably to a question. In addition, the PIR report should show how many respondents indicated that a particular question was not applicable, or simply declined to answer that question. No assumptions should be made as to the opinions of respondents that have left an answer blank. In the case of multiple-choice questions, the analysis should show the percent of total respondents that chose each of the possible answers, as well as a tally of those that responded to the survey, but not to the individual question. As often as possible, a visual representation, such as a pie chart, should be used to present the information. Any charts used should be in addition to a written explanation of the analysis.

Some of the most valuable information found in a PIR Satisfaction survey is comments and opinions provided by respondents. A selection of these comments should be presented in the PIR Report. Although the PIR Evaluation team should not intend to censor survey responses, not every response can or

should be recorded. A selection of responses should be chosen that accurately reflects the range of suggestions or opinions provided. All comments should be enclosed in quotation marks and should use the exact wording provided by the survey participant.

5.2.12.5   Additional Uses for Survey

Although the PIR review could be divided into as many as 14 evaluation areas, these areas often overlap, or hold similar goals. The PIR Satisfaction Survey can be used to learn about aspects of the various sections. Because the surveys invite uninhibited comment regarding various aspects of the project, the information can add insight into the evaluation for each individual section.

By using the PIR Satisfaction Survey as a source document, the survey can help to measure a goal that has not been adequately addressed in system paperwork provided to the PIR Evaluation team. In addition, the survey information can reiterate or contradict information uncovered during the document analysis. For instance, a system might score very well on their Security section, having followed all of the appropriate Federal Student Aid guidelines; however, users may indicate that they have concerns about the security of the information residing there. Alternatively, the PIR team may be missing needed test information to show that a system has been successfully deployed, but be able to use comments from the survey that indicate successful use of the system.

The PIR Satisfaction Survey provides a forum for customers and users to provide additional observations or suggestions about a project. Customers might be able to indicate whether the new system contains all promised improvements and be asked to comment on any concerns. Customers' opinions concerning performance levels and ease of system maintenance can provide valuable lessons for future projects. Customers also have unique perspective to comment on daily system accessibility and service issues when problems with the system are encountered.

The most important aspect of a PIR is to provide recommendations to improve the system or process in the future. For this reason, though it is not standard procedure, actual survey results can be provided in a confidential format to management, if needed. By utilizing the unique insight provided by a system user, future development can be tailored to meet the customer groups' needs. The suggestions and recommendations provided by survey respondents can be included in the PIR Review Recommendations section.

5.2.13 Process Improvement and Innovation

The investment and project management process relies on process improvements and appropriate incorporation of technological innovations to

increase the opportunities of success of future projects and initiatives. This includes feedback from previous projects and the use of innovative information technology products and methodologies to help achieve Federal Student Aid 's strategic goals and objectives. Completed project feedback beyond lessons learned includes implementation and communication techniques, new system usage information, and process and product impact analysis results.

Research and investigation will identify new processes and products that may potentially be used for system development. Identification and incorporation of IT innovations includes research of industry advancements and details on how to successfully apply them in specific project environments. Process improvement and innovation keeps ED from falling behind industry standards in IT implementation.   Process improvement and innovation originate from an idea or a business need to improve future projects by implementing new technologies and enhanced system development methodologies. These ideas and needs are described in the Concept of Operations and Vision document.

The implementation of these process improvements and new technological innovations should be provided in the design, development and testing documents that describe how these improvements will be utilized. In addition, technical references publish prescribed industry standards and cutting edge products. Furthermore, lessons learned repositories of previous project experiences capture proven techniques or products that may be successfully incorporated into future projects. The business practices to maintain industry standards or implement lessons learned and innovative ideas can affect all phases of system development.

The purpose and benefits of implementing process improvement and innovative technologies should be clearly documented and the means to implement these improvements should be described in documents that are used to support the entire system development effort. Thus, the level of improvement that is expected and the areas that may be impacted by the process improvement or innovation also should be documented. In addition, operational cost benefits should be reviewed in order to determine if these implemented enhancements improved the overall success of the project as originally proposed. For example, the use of cutting-edge technology in system integration may be expected to lower the cost of operating disparate, stand-alone applications by a specified amount. Process improvement and innovation should offer measurable benefits.

The project development team and project management support team should document all innovative processes and technologies used during the system development effort. These documents should be reviewed by the evaluation team to determine not only if the improvement process concept and innovation complies with ED's standards and practices, but also that the technology used is consistent with industry standards. The evaluation team then determines if the

use of the new technology or process methodology resulted in the intended benefits according to the project objectives.

Furthermore, the evaluation team can determine if the system was developed according to the innovative methods and products as described in the system documents. Any unintended impact to the system, either positive or negative, from the use of innovation or process improvement should be documented in lessons learned. As such, all proven and approved process improvements that have been verified should be included in the PIR Report and incorporated into future project initiatives.

5.2.14 Project Lessons Learned

In order to continually improve processes and increase IT investment success rates, each project should capture lessons learned during the execution of that project. A careful review of lessons learned allows ED and its industry partners to benefit from any innovations, corrections or enhancements that arise during the project. In addition, it can pass along valuable information to decrease costs and risks in future projects. Compiling and reviewing lessons learned can provide a useful closure device for project team members, regardless of the project's success.

The project management support team should produce a final lessons learned summary report. To facilitate this report, events should be captured as they occur on a lesson learned summary form. To provide the most value from this exercise, all information surrounding noteworthy events should be recorded. The pre-event condition should be noted, a description of the event outlined, with results and post-event conditions clearly stated. The main purpose of this exercise is to make sure that the value of the lesson learned is made available to everyone, including those personnel not directly involved in the event, or even the project.

The collection mechanism for lessons learned can be as simple as a notebook containing all lessons learned summary forms. However, in order to be accessible to all project personnel, a web site can be an invaluable clearinghouse for information. Individuals involved in the project can post lessons learned, read postings written by others, and comment or add to information that has been posted by others.

Lessons should be collected or compiled by those directly involved in the incidents being reported. Most importantly, the feedback must be accessible during the project to all project members, external project support personnel, and management. Choosing a standard format for compiling lessons learned will allow for more effective contributions from and wider participation by personnel at

all levels. Then, the final summary report should be made available to other projects and management as well.

The evaluation team reviews the final lessons learned summary report along with any other information concerning the lessons learned. The evaluation team checks the records to determine whether events have been clearly documented and, likewise, whether the report has effectively summarized the lessons identified during the course of the project.   Also, the team will evaluate whether any lessons have been, misconstrued, or taken out of context. In addition, any lessons learned that relate to the other evaluation areas will be identified and included in those analysis efforts. The evaluation team focuses on confirming that valuable lessons learned information is available for future efforts.

6 PIR Report Conclusion and Recommendations

At the end of the PIR evaluation process, the Evaluation Team develops an overall conclusion and set of recommendations. The conclusion consists of one or two paragraphs describing how the investment met or did not meet high-level goals programmatic goals. The Evaluation Team also develops a set of recommendations for the IT Investment. These recommendations may include both investment-specific recommendations and recommendations to improve FSA's IT project management processes. Generally, it is desirable that recommendations be stated in a way that they are as actionable as possible.

The conclusion and recommendations are included in the final section of the PIR report and may be re-stated in the executive summary.

7 Summary

The information in this Post Implementation Review Process Description is intended to establish guidelines and common procedures for performing a PIR on systems deployed by Federal Student Aid. The document has defined objectives, activities and documentation required to effectively perform a PIR. Generic and reusable PIR support templates have been included in the appendices of this document.

Five major roles and responsibilities have been defined:
- Chief Information Officer
- Project Sponsor
- Project Management Support Team
- Project Development Team
- Evaluation Team (PIR Support Contractor)

Together, these 5 individuals or groups set project goals, collect metrics, and provide the information and expertise necessary to perform a PIR.

The PIR is a critical part of the Evaluate Phase of the CPIC process. In fact, PIR results and appropriate action recommendations are key factors in evaluating a project's success. The PIR process is a four-step process:

- ***Step One - Assess mission needs and determine project goals.*** Baseline goals are determined including cost, scheduling, risk and performance measures.
- ***Step Two - Collect and analyze data.*** The evaluation team compiles project results and records any variances.
- ***Step Three - Provide major findings and issues.*** Assessment areas are documented with a summary of findings that support conclusions of PIR report.
- ***Step Four - Provide feedback and incorporate lessons learned.*** Completed PIR Report is provided and process improvements are identified for future projects.

Each step is built upon the successful completion of the previous step and the cooperation of personnel in all of the key roles previously defined. The PIR can provide an analysis of project data across fourteen important evaluation areas.
- Business Case & Vision Planning
- Functional Requirements versus Implementation
- Product Performance Metrics
- Data Framework
- Capacity Analysis
- Data Architecture
- Security

- Risks & Risk Mitigation
- Technical Architecture
- Cost
- Schedule
- Customer & User Satisfaction
- Process Improvement and Innovation
- Project Lessons Learned

By focusing on each evaluation area separately, the evaluation team can form a carefully considered review of the project and measure the project's goals against each individual portion of the overall plan. A comprehensive evaluation requires a review of goals and metrics provided by the development effort in each of the assessment areas listed above. Software development efforts and other IT projects can be assessed against a combination of those evaluation areas.

The PIR process analyzes qualitative and quantitative measures of the selected project. The institutionalization of the PIR process as part of the investment management process produces significant benefits for all PIR participants. Once all the activities in the evaluate stage of the CPIC process are completed, the project goes into a control phase and is monitored as a steady state project. Not only may the evaluation affect the project being reviewed, but also it may affect the evaluation process of future projects.

Once a project is in a steady state, with no planned upgrades, additional PIRs are recommended every 2-3 years to ensure the system continues to meet its objectives and still satisfies user needs. However, any upgrades or new functionality that are planned for existing systems should include a new PIR regardless of the previous schedule. The evaluation process is continuously evolving as the lessons learned about the PIR process are incorporated into the review process and the investment management process of future projects.

Appendix A – Acronyms

CCA	Clinger-Cohen Act
CIO	Chief Information Officer
CPIC	Capital Planning and Investment Control
ED	Department of Education
GAO	General Accounting Office
GPRA	Government Performance and Results Act
GSA	General Services Administration
IT	Information Technology
ITIM	Information Technology Investment Management
IV&V	Independent Verification and Validation
N/A	Not Applicable
NIST	National Institute of Standards and Technology
OMB	Office of Management and Budget
PIR	Post Implementation Review
PRR	Production Readiness Review
QA	Quality Assurance
QA Team	Enterprise Quality Assurance Team (part of Federal Student Aid /CIO)
ROI	Return on Investment
RTM	Requirements Traceability Matrix
SDLC	Solution Development Life Cycle
SIS	Share in Savings
TA	Technical Architecture
US	United States
VDC	Virtual Data Center

Appendix B – Referenced Documents

Department of Education Handbook for Information Technology Security Policy,
June 10, 2003.

Federal Student Aid Production Readiness Process Procedures, version 5.0
Release 2.0, January 01, 2006.

Federal Student Aid Security Solution Lifecycle Guide, April 1, 2002.

Federal Student Aid Technology Policies, Standards and Products Guide,
version 4.0, August 1, 2003.

Federal Student Aid Investigate and Select Application Architecture Components,
Federal Student Aid Post Implementation Review Process Description, version 1,
Jan. 16, 2003.

Federal Student Aid, Integrated Technical Architecture Detailed Design
Document, Volume 2 – Internet Architecture, October 13, 2000.

Federal Student Aid, Integrated Technical Architecture Detailed Design
Document, Volume 5 – Security Architecture, Appendix A – Federal Student Aid
Information Security General Minimum, October 13, 2000.

Security Baseline Standards, DRAFT, July 21, 2000.

Federal Student Aid, Integrated Technical Architecture Detailed Design
Document, Volume 6 – Development Architecture, October 13, 2000.

GAO/AIMD-10.1.23 ITIM Framework, version 1.0, not dated.

General Accounting Office (GAO), Information Technology Investment
Management: A Framework for Assessing and Improving Process Maturity,
Version 1.1, March 2004. GAO-04-394G

GSA Capital Planning & IT Investment Guide, February 2000.

National Institute of Standards and Technology (NIST) Integrating IT Security into
the Capital Planning and Investment Control Process, version 1.0 January 2005.

National Institute of Standards and Technology Special Publication 800-34,
Contingency Planning Guide for Information Technology Systems, not dated.

Office of Management and Budget Circular No. A-130, Appendix III - Security of Federal Automated Information Resources, February 8, 1996.

U.S Department of Education Post Implementation Review User Guide, DRAFT, Revision 6, January 4, 2002.

Appendix C – List of Documents Required to Support PIRs

This is the list of project documents that can be used to support a post implementation review (PIR). This list, though not an official list of Federal Student Aid, identifies the types of documents that can be critical to performing a complete system PIR, as well as several others that provide useful information for the evaluation. The critical documents are necessary to ensure that the basic PIR areas are assessed. The non-critical documents may become crucial, if the critical documents do not contain all the information that describes a particular PIR focus area. For example, Schedule Change Requests may become a required document, if significant schedule changes are shown, but are not described, in the Final Project Schedule document.

The table below shows a list of typical project documentation that can be used to support PIRs for each of the fourteen PIR evaluation areas. In addition, the table indicates which project personnel would most likely be able to supply the document. The documents, that could be most valuable to performing a PIR, are followed by an asterisk. Any of the suggested documents that are available should be provided to the evaluation team for inclusion into the PIR. A ✓ in the table indicates that the document listed in that row might be provided by personnel in the role listed for that column.

List of Types of Documents to Support a PIR

Required Documents by Evaluation Area Supported (* = Potentially PIR-valuable Document)	Document Sources				
	CIO	Project Sponsor	Project Mgmt Team	Project Dev Team	Evaluation Team
Business Case and Vision Planning					
Business Case*	✔	✔	✔	✔	
Business Vision	✔	✔	✔	✔	
Concept of Operations	✔	✔	✔	✔	
Project Plan		✔	✔	✔	
Production Readiness Review		✔	✔	✔	
Functional Requirements Versus Implementation					
Requirements Traceability Matrix*			✔	✔	
Requirements Document*			✔	✔	
Functional Specification*			✔	✔	
Test Plans			✔	✔	
Test Cases			✔	✔	
Test Results*			✔	✔	
Engineering Change Requests			✔	✔	
Product Performance Metrics					
Performance Test Plan*			✔	✔	
Performance Test Results*			✔	✔	
Capacity Test Plan			✔	✔	
Capacity Test Results			✔	✔	
Stress Test Results			✔	✔	
Data Framework					
Framework Specification		✔	✔	✔	
Framework Strategies		✔	✔	✔	
Capacity Analysis					
Environment Performance Goals		✔	✔	✔	
Environment Performance Results		✔	✔	✔	
Data Architecture					
Data Management and Organization Plan		✔	✔	✔	
Data Security Plan		✔	✔	✔	
Security					
Security Plan*		✔	✔	✔	
Contingency Plan		✔	✔	✔	
Disaster Recovery Plan		✔	✔	✔	
Risks and Risk Mitigation					

Required Documents by Evaluation Area Supported (* = Potentially PIR-valuable Document)	Document Sources				
	CIO	Project Sponsor	Project Mgmt Team	Project Dev Team	Evaluation Team
Risk Assessment		✔	✔	✔	
Risk Summary		✔	✔	✔	
Status Reports		✔	✔	✔	
Technical Architecture					
Technical Architecture Diagrams*			✔	✔	
Final or Current Technical Diagrams*			✔	✔	
Technical Specifications/Detailed Design			✔	✔	
Cost					
Original Cost Plan*	✔	✔	✔	✔	
Final Cost/Invoices*	✔	✔	✔	✔	
Cost Change Requests			✔	✔	
Task Order Price Proposal	✔	✔	✔	✔	
Schedule					
Original Project Schedule*	✔	✔	✔	✔	
Final Project Schedule*			✔	✔	
Schedule Change Requests			✔	✔	
Task Order Proposal (for each modification)	✔	✔	✔	✔	
Final Project Deliverables			✔	✔	
Production Readiness Review			✔	✔	
Customer and User Satisfaction					
Independent Customer Feedback*					✔
Independent User Feedback*					✔
System Collected Survey Data			✔	✔	
System Collected Email Feedback			✔	✔	
Project Improvement and Innovation					
Statement of Objectives	✔	✔	✔	✔	
Final System User Interface Description/Graphics			✔	✔	
Project Lessons Learned					
Final Lessons Learned Document			✔	✔	
IV&V Documents		✔	✔	✔	

Appendix D – Evaluation Worksheet Template

PIR EVALUATION SHEET			
General information			
Title:			
Description:			
PIR Conducted By:			
Date of PIR:			
Evaluation Area: Business Case & Vision Planning			
Item	Incomplete	Draft Version Completed Date	Final Version Completed Date
Business Case			
Comments:			
Project Plan			
Comments:			
Evaluation Area: Functional Requirements Versus Implementation			
Item	Incomplete	Draft Version Completed Date	Final Version Completed Date
Requirements Traceability Matrix			
Comments:			
Evaluation Area: Product Performance Metrics			
Parameter	Baseline Goal	Actual Performance	Variance
Capacity			
Source of Information			
Comments:			
Speed			
Source of Information			
Comments:			
Evaluation Area: Data Framework			
Parameter	Baseline Goal	Actual Performance	Variance
Data Access Methods			
Source of Information			
Comments:			
Data Standards			
Source of Information			
Comments:			
Data Quality			
Source of Information			

Comments:			
Data Ownership			
Source of Information			
Comments:			

Evaluation Area: Capacity Analysis			
Parameter	Baseline Goal	Actual Performance	Variance
Environment Capacity			
Source of Information			
Comments:			
Environment Speed			
Source of Information			
Comments:			

Evaluation Area: Data Architecture Analysis			
Parameter	Baseline Goal	Actual Performance	Variance
Organization and Management			
Source of Information			
Comments:			
Data Integrity and Security			
Source of Information			
Comments:			

Evaluation Area: Security Analysis			
Component	Insufficient Documentation	Draft Version Completed Date	Final Version Completed Date
Security Plan			
Comments:			
Contingency Plan			
Comments:			
Disaster Recovery Plan			
Comments:			

Evaluation Area: Risks & Risk Mitigation			
Component	Insufficient Documentation	Draft Version Completed Date	Final Version Completed Date
Risk Management Plan			
Comments:			

Evaluation Area: Technical Architecture			

Component	Incomplete	Draft Version Completed Date	Final Version Completed Date
Technical Architecture			
Comments			
Evaluation Area: Cost			
Deliverable Number	Baseline Cost	Actual Cost	Variance
{Cost Item 1}			
Source of Information			
Item Description:			
Responsible Party:			
Comments:			
{Cost Item 2}			
Source of Information			
Item Description:			
Responsible Party:			
Comments:			
Evaluation Area: Schedule			
Milestone/ Deliverable	Baseline Date	Actual Date	Variance
Requirements			
Source of Information			
Comments:			
Preliminary Design			
Source of Information			
Comments:			
Detailed Design			
Source of Information			
Comments:			
Development			
Source of Information			
Comments:			
Testing Type:			
Source of Information			
Comments:			
Deployment			
Source of Information			
Comments:			
Evaluation Area: Customer and User Satisfaction			

Customer Survey
Survey Group:
Source of Information:
Results Number of replies: Percentage of positive replies: Percentage of negative replies: Summary of suggestions for improvement:
Comments:

User Survey
Survey Group:
Source of Information:
Results Number of replies: Percentage of positive replies: Percentage of negative replies: Summary of suggestions for improvement:
Comments:

Evaluation Area: Process Improvement & Innovation
What innovations were used in the implementation? What were the results of the innovations? Source of Information:
Comments:

Evaluation Area: Project Lessons Learned
Number: 1 Type: Applicability: ☐ FSA Group ☐ Office-wide ☐ Future releases of current project only Description:
Number: 2 Type: Applicability: ☐ FSA Group ☐ Office-wide ☐ Future releases of current project only Description:

Stakeholder Assessment
ED Strategic Goals
What strategic goals outlined by management were not accomplished? Source of Information:

What was the system's impact on Federal Student Aid 's mission?
Source of Information:
Recommendations to improve CCA integration
Comments:

Appendix E – Generic Questions for Customer Survey

	Survey Question	Answer Options
1.	What is your job title or description?	Short Answer
2.	How has the *<Project Title>* improved your ability to*<perform the desired function established by the project goals>*?	Short Answer
3.	What types of performance issues, if any, are you experiencing?	Short Answer
4.	If the project did not meet its targeted schedule, what were some of the factors that caused the delay?	Short Answer
5.	How has *<Project Title>* helped you make better managerial decisions?	Short Answer
6.	In your opinion, are there any requirements, or functionality missing in *<Project Title>*? If so, what are they and why do you think these requirements were not included?	Short Answer
7.	If you were involved in the testing of *<Project Title>*, are you confident that *<Project Title>* has been adequately tested?	Yes/No/Not Applicable
8.	If you are involved with the maintenance of any components or subcomponents of the system, have you been satisfied with the maintainability of the system? Please explain.	Short Answer
9.	How would you rate the availability of the system?	Multiple Choice • The system is always available. • The system is occasionally unavailable. • The system is unavailable for several hours at a time. • The system has been unavailable for more than one day.
10.	If you had problems using the system, how long did it take for your problems to be resolved?	Multiple Choice • 1 hour or less • Several hours • More than 1 day • Several days • I had no problems using *<project title>*
11.	Were any technical issues/problems resolved quickly and to your satisfaction?	Yes/No/Not Applicable
12	Do you believe the technology used in the implementation of *<Project Title>* is on par with current industry standards? If not, please explain.	Short Answer
13	Do you have any security concerns regarding *<Project Title>*? If so, please describe them.	Short Answer
14	What additional observations or suggestions for improvement can you make regarding *<Project Title>*?	Short Answer

Appendix F – Generic Questions for User Survey

	Survey Question	Answer Options
1	What is your job title or description?	Short Answer
2	How has the *<Project Title>* improved your ability *<to perform the desired function established by the project goals>*?	Short Answer
3	What issues/problems do you have with the *<Project Title>?*	Short Answer
4	Do you like the way *<Project Title>* presents information?	Yes or No
5	Do you believe *<Project Title>* is easy to use?	Yes or No
6	What features of *<Project Title>* do you think are useful or helpful?	Short Answer
7	What features of *<Project Title>* do you think are difficult to use?	Short Answer
8	What, if any, data accuracy or data quality problems have you experienced?	Short Answer
9	Are you satisfied with *<Project Title>* overall?	Yes or No
10	Compared to similar web sites that you access, how would you rate the response time of *<Project Title>*?	Multiple Choice • The system responds promptly • Navigation is sluggish • The system 'times out' or returns error messages
11	How would you rate the availability of the system?	Multiple Choice • The system is always available • The system is occasionally unavailable • The system is unavailable for several hours at a time • The system has been unavailable for more than a day
12	If you had problems using the system, how long did it take for your problems to be resolved?	Multiple Choice • 1 hour or less • Several hours • More than 1 day • Several days • I had no problems using *<project title>*
13	Were any technical issues/problems resolved quickly and to your satisfaction?	Yes/No/Not Applicable
14	Were you satisfied with the Customer Service Representative's demeanor and approach to solving problems encountered?	Yes/No/Not Applicable
15	Do you have any security concerns regarding *<Project Title>*? If so, please describe them.	Short Answer
16	What additional observations or suggestions for improvement can you make regarding *<Project Title>*?	Short Answer

Appendix G – PIR Scorecard Template

PIR Categories	Project Review Status
Business Case & Vision Planning	**GRADE (#)** – Description
Functional Requirements Versus Implementation	**GRADE (#)** – Description
Product Performance Metrics	**GRADE (#)** – Description
Data Framework	**GRADE (#)** – Description
Capacity Analysis	**GRADE (#)** – Description
Data Architecture	**GRADE (#)** – Description
Security	**GRADE (#)** – Description
Risks & Risk Mitigation	**GRADE (#)** – Description
Technical Architecture	**GRADE (#)** – Description
Cost	**GRADE (#)** – Description
Schedule	**GRADE (#)** – Description
Customer & User Satisfaction	**GRADE (#)** – Description
Process Improvement & Innovation	**GRADE (#)** – Description
Lessons Learned	**GRADE (#)** – Description

PIR Rating Key	
High (5)	All goals in the PIR category documented and all of those documented project goals achieved.
Medium High (4)	80-99% of documented project goals achieved.
Medium (3)	60-79% of documented project goals achieved.
Medium Low (2)	40- 59% of documented project goals achieved.
Low (1)	Less than 40% of documented project goals achieved.
Incomplete (0)	Little or no documentation provided. Review could not be completed.

Cost rating criteria

Once a cost baseline has been set, the following cost rating rule applies:

High (5): Cost variance of +2% (over-expended) or up to -2% (under- expended).
Medium expended High (4): Cost variance of up to +5% (over- expended) or -5% (under-).
Medium (3): Cost variance of up to +10% (over-expended) or -10% (under-expended)
Medium Low (2): Cost variance of up to +20% (over-expended) or -20% (under-expended).
Low (1): Cost variance is greater than +20% or -20%
Incomplete (0): Insufficient documentation exists to complete a cost analysis for this investment.

Neutral: Unable to complete cost analysis due to reasons outside of the control of both the project team and the PIR review team. Note that the project team is responsible for tracking their budget and funds spent. A lack of documentation on the part of the project team may not result in a neutral rating.

Following is the summary of the Scores for Cost PIR area based on the budgeted fund provided by FSA CFO.

Cost Rating Key	
High (5)	Project cost expended is within ±2% of budgeted.
Medium High (4)	Project cost expended from 2.1% to 5.0% or -2.1% to -5.0% of budgeted
Medium (3)	Project cost expended from 5.1% to 10.0% or -5.1% to -10.0% of budgeted
Medium Low (2)	Project cost expended from 10.1% to 20.0% or -10.1% to -20.0% of budgeted
Low (1)	Project cost expended over ±20% of budgeted
Incomplete (0)	Little or no documentation provided. Review could not be completed.

Cost variance is determined by a comparison of the actual expenditures "Invoiced Cost" to the established Cost Baseline.

Survey rating criteria (when ACSI Results are used)

When the American Customer Satisfaction Index (ACSI) instrument was employed for the Customer and User satisfaction survey, the determination of PIR score will follow the ACSI results, classified by Excellent, Good, Fair and Poor which correspond to scores of 5, 4, 3, and 2, respectively, as shown in above matrix chart. That is, if the customer satisfaction index is within the range of Excellence as reported in the ACSI survey, the score will be 5 and so on.

Appendix H – PIR Report Format

Executive Summary (See Appendix J)

1.0   Introduction
        1.1   Identification of Document
        1.2   System Background
        1.3   Scope of Review
        1.4   Document Overview

2.0   Referenced Documents

3.0   Findings
        3.1   Business Case & Vision Planning
                3.1.1 Strategic Goals
                3.1.2 Goal Measurements
                3.1.3 Variances
                3.1.4 Evaluation

        3.2   Functional Requirements versus Implementation
                3.2.1 Function Requirements
                3.2.2 Goal Measurements
                3.2.3 Variances
                3.2.3 Evaluation

        3.3   Product Performance Metrics
                3.3.1 Project Goals
                3.3.2 Goal Performance Measurements
                3.3.3 Variances
                3.3.4 Evaluation

        3.4   Data Framework
                3.4.1 Data Framework and Specification Goals
                3.4.2 Goal Measurements
                3.4.3 Variances
                3.4.4 Evaluation

        3.5   Capacity Analysis
                3.5.1 Environment Capacity Goals
                3.5.2 Goal Measurements
                3.5.3 Variances
                3.5.4 Evaluation

        3.6   Data Architecture

Appendix I – Recommendation Checklist for PIRs

Recommendation Checklist		
This document contains a checklist of recommended items that will help to improve the probability of success for any IT project and provide a solid foundation to assist the project manager in preparing for a PIR. Sections are broken down to address each of the eleven PIR evaluation areas outlined in the PIR Process Description.		
Business Case & Vision Planning		
Yes	No	Recommended Items
☐	☐	Do you have a Business Case that includes the following information? ❑ Description of why the proposed system is an appropriate investment ❑ An overall timeline with milestones ❑ Definition of primary goals of the system ❑ An estimated budget
☐	☐	Do you have a Vision Document that describes how the project supports the mission of Federal Student Aid?
☐	☐	Do you have a Concept of Operations that includes the following information? ❑ Description of quantitative and qualitative characteristics ❑ Description of organizational objectives ❑ Definition of user community
Functional Requirements vs. Implementation		
Yes	No	Recommended Items
☐	☐	Do you have a Functional Requirements Document? ❑ Is each requirement unambiguous, testable, and concise?
☐	☐	Do you have a Detailed Design Document?
☐	☐	Do you have a Requirements Traceability Matrix?
☐	☐	Do you have a mechanism for capturing requirements?
Product Performance Metrics		
Yes	No	Recommended Items
☐	☐	Do you have a Performance Plan that outlines detailed performance goals?
☐	☐	Do you have a Performance Testing Plan that measures the following elements? ❑ Technical Performance Factors ❑ System Performance ❑ Response Times ❑ Storage Capabilities ❑ Data Integrity
☐	☐	Have you generated detailed test scripts that support the performance test plan?
☐	☐	Are all techniques and mechanisms that will gather the testing metrics in place?
☐	☐	Have you generated final test results?
Data Framework		
Yes	No	Recommended Items
☐	☐	Do you have a Framework Specification that includes the following: ❑ Data Access Methods ❑ Data Standards ❑ Data Quality ❑ Data Ownership
☐	☐	Have you implemented and validated the Framework Specification.

Capacity Analysis		
Yes	No	Recommended Items
☐	☐	Do you have a Data Capacity and Utilization Plan
☐	☐	Do you have Capacity Test Results

Data Architecture		
Yes	No	Recommended Items
☐	☐	Do you have a Data Organization and Management Plan?
☐	☐	Do you have a Data Quality Assurance Plan?
☐	☐	Does the physical architecture include security measures?

Security		
Yes	No	Recommended Items
☐	☐	Do you have a Security Plan that complies with ED standards?
☐	☐	Do you have a Contingency Plan?
☐	☐	Do you have a Disaster Recovery Plan?
☐	☐	Is there a mechanism in place to document corrective actions taken and outcomes realized?

Risks & Risk Mitigation		
Yes	No	Recommended Items
☐	☐	Do you have a Risk Management Plan?
☐	☐	Do you have a mechanism for documenting risks as they occur?

Technical Architecture		
Yes	No	Recommended Items
☐	☐	Do you have a detailed technical architecture document that includes the following elements? ❑ Ensures compliance with industry standards ❑ Description of the physical layout of the system ❑ Description of reporting, processing and storing capabilities ❑ Network diagrams ❑ Architecture connectivity models
☐	☐	Does the technical architecture define quantifiable goals regarding the following elements? ❑ Processing speed ❑ Capacity ❑ Security
☐	☐	Do you have a change control process?

Cost		
Yes	No	Recommended Items
☐	☐	Do you have a written budget plan that includes the following elements? ❑ Clearly stated baseline cost goals ❑ Assignment of budget responsibilities
☐	☐	Have you defined a method to record expenditures?
☐	☐	Do you have cost revision documentation and a change approval process?

Schedule		
Yes	No	Recommended Items
☐	☐	Do you have an original project schedule that includes the following elements? ❑ Specific milestones ❑ Clearly defined durations for each implementation phase ❑ Development tasks clearly assigned to specific phases of the effort ❑ Mechanism for identifying assigned/responsible personnel

Yes	No	
☐	☐	Do you have a change tracking mechanism?
Customer & User Satisfaction		
Yes	No	Recommended Items
☐	☐	Are the customers and users of the specific system clearly defined?
☐	☐	Are clear goals defined for each kind of customer or user?
Process Improvement and Innovation		
Yes	No	Recommended Items
☐	☐	Are process improvements and innovations clearly outlined in project documentation?
☐	☐	Are specific plans for implementing improvements clearly documented?
☐	☐	Is there a clear description of measurable benefits?
☐	☐	Are metrics clearly defined?
Project Lessons Learned		
Yes	No	Recommended Items
☐	☐	Is there a mechanism in place to collect lessons-learned that includes the following elements? ❑ Accessibility by all project personnel ❑ Standardized submission format ❑ Ability to submit throughout all phases of project

Appendix J – Executive Summary Template

Executive Summary

Business Case
Name of Business Case - Fiscal Year
IT Funding Requested: $X

[Include information about any funding returned and funding that is included in scope of PIR. If PIR scope does not include the entire IT funding request, define what the scope of the PIR is and which parts of the investment were not reviewed]

Results
This section summarizes major findings that are included in the PIR report with one bullet point per major finding. Those items that lower the PIR score are of particular interest. Exceptionally positive feedback should also be noted in this section.

Survey Information
This section should include detailed information regarding the survey audience and how it was conducted. The number and categories of participants should be included and on smaller surveys participant names should be included. The survey methodology and any other insight into the survey process may be included here.

PIR Conclusion and Recommendations
The report's conclusion and recommendations are re-summarized at this point.

Note: The executive summary should not exceed two to three pages in length and will ideally be limited to a single page.