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U.S. DEPARTMENT OF EDUCATION

DEPARTMENTAL DIRECTIVE

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Lifecycle Management (LCM) Framework
Version 1.0

Table of Contents

I. INTRODUCTION 2
II. PURPOSE 3
III. POLICY 3
IV. AUTHORIZATION 3
V. APPLICABILITY 3
VI. DEFINITIONS 3
VII. RESPONSIBILITIES 4
VIII. THE FRAMEWORK 4
APPENDIX A: ACRONYM LIST 19
APPENDIX B: GLOSSARY 20
APPENDIX C: LCM FRAMEWORK 1.0 GRAPHIC 24
APPENDIX D: DEPARTMENTAL DOCUMENT REFERENCES 25
APPENDIX E: TAILORED PROJECT GUIDE TEMPLATE 26

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I. INTRODUCTION

The U.S. Department of Education (Department) LCM Framework (Framework) is a structured approach, outlining required stages, key activities and core deliverables that provides a foundation for aligning existing interrelated processes, such as the Office of the Chief Information Officer's (OCIO) Information Technology Investment Management (ITIM) process, the Office of the Chief Financial Officer's (OCFO) Contracts and Acquisition Management (CAM) process and processes associated with project management, used in delivering information technology (IT) solutions. The purpose of the Framework is to help existing Department processes work together more efficiently. It is not intended for reengineering existing processes, but rather, to provide a foundation and frame of reference for aligning them.

Staff from various processes related to LCM will be responsible for determining the particulars of how their processes will work within the Framework. In aligning processes, the Framework provides the basis for executing enforcement mechanisms already contained in those processes. Through a stage gate review, the Framework focuses on results obtained at the end of each stage to assist investment oversight, product quality and compliance to Department directives and regulations. However, these stage gate reviews do not represent an additional enforcement layer, but rather are a means to facilitate and coordinate business and technical reviews for each stage already present in existing processes.

The Framework is flexible concerning core deliverable length and the addition of deliverables to accommodate solutions with varying cost, complexity and time constraints. Small projects[1] are required to perform all Framework activities and core deliverables; however, the total documentation for a very small project might amount to one page, for example. How project staff conducts the stage gate review for their small projects will help them determine how they will conduct the Framework's business and technical activities and reviews. Additionally, project staff should rely on existing Department guidance documents and staff expertise relevant to small projects to determine how those projects should align and work within the Framework.

By using this Framework directive, the Department will realize the following benefits:

- A single reference to inform Department employees of expectations, activities and core deliverables associated with IT solutions development.
- Improved product quality and reduced rework by establishing standard business and technical reviews throughout the development of IT solutions.
- Improved oversight by encouraging and enabling integrated and coordinated reviews.
- Improved performance management of projects through review of project cost and schedule in alignment with the Department's mission or objectives.
- A mechanism by which projects can define their deliverables against the scope of the IT solution.

[1] Please refer to Appendix A of the draft "ITIM Policy"ACS Directive, for a description of small projects as defined by the Office of Management and Budget (OMB). The "ITIM Policy" ACS Directive is referenced in Appendix D of this directive.

II. PURPOSE

This directive sets forth the Department's policy for using the Department's LCM Framework to provide the foundation for the implementation of standards, processes and procedures in developing IT solutions. All LCM related processes will use the Framework to align and streamline their processes to support effective oversight and management of IT solution development.

III. POLICY

This directive applies to the development, acquisition, implementation, maintenance and disposal of IT solutions regardless of cost, complexity and time constraints.

IV. AUTHORIZATION

The following are links to Federal regulations and policies that set forth the legal obligations for the Department to use a lifecycle management approach:

- Clinger-Cohen Act of 1996 (Clinger-Cohen Act); (Formerly the Information Technology Management Reform Act, or, ITMRA)
- Office of Management and Budget (OMB) Circular A-123
- OMB Circular A-130

The Department's OCIO will own and maintain the Framework and work diligently to communicate and provide support for its implementation.

V. APPLICABILITY

This directive applies to all Department employees and contractors engaged in the development, acquisition, implementation, maintenance and disposal of IT solutions. Nothing in this directive is meant to excuse or exempt contractors from satisfying all requirements of their contracts.

VI. DEFINITIONS

The following are key definitions related to this directive.

A. ***Lifecycle Management*** is the coordination of activities associated with the implementation of information systems from conception through disposal, which include defining requirements, designing, building, testing, implementing, establishing operations and disposing of systems.

B. ***Framework*** is a structured approach of required stages, key activities and core deliverables that provides a foundation for aligning existing interrelated processes within the Department, regardless of system lifecycle methodology employed.

C. ***Solution*** pertains to automated information systems, software applications and manual processes.

D. ***Stage*** is a definitive section of the lifecycle that indicates a specific purpose or goal. The end of each stage is marked by a "Stage Gate," noting the exit from one stage and entry into the next.

E. ***Key Activity*** is a required task, procedure or process.

F. ***Core Deliverable*** is a required document that must be completed and approved by the end of a particular stage of the lifecycle.

G. ***Exit /Entry Criteria*** refers to requirements that must be completed and approved in order to exit one stage and enter the next.

H. ***Stage Gate Review*** is the integration of various business and technical reviews that ensures core deliverables (and any additional deliverables) required for that stage have been completed.

VII. RESPONSIBILITIES

The following are staff responsibilities associated with this directive:

A. ***Project Manager*** is responsible for creating deliverables and ensuring that business and technical reviews are executed and required deliverables are completed. This individual is also responsible for managing the day-to-day operations of the Department's IT solutions.

B. ***Deliverable Reviewer*** is responsible for reviewing and approving the content of all required deliverables. Deliverable Reviewers are staff from various business and technical areas (e.g. ITIM, CAM) with specific knowledge of the requirement areas.

C. ***Stage Gate Reviewer*** is responsible for authorizing a project's progress into the next stage based on the completion of reviews and deliverables for each stage.

VIII. THE FRAMEWORK

The Framework is structured approach of required stages, key activities and core deliverables that provides a foundation for aligning existing interrelated processes such as, the OCIO's ITIM process, OCFO's CAM process and processes associated with project management,

used in delivering IT solutions. The purpose of the Framework is to help existing Department processes work together more efficiently. It is not intended to reengineer existing processes, but rather, to provide a foundation and frame of reference for aligning them.

Staff from various processes related to LCM will be responsible for determining the particulars of how their processes will work within the Framework. In aligning processes, the Framework provides the basis for executing enforcement mechanisms already contained in those processes. Through a stage gate review, the Framework focuses on results obtained at the end of each stage to assist investment oversight, product quality and compliance to Department directives and regulations. However, these stage gate reviews do not represent an additional enforcement layer, but rather are a means to facilitate and coordinate business and technical reviews for each stage already present in existing processes.

The Framework is flexible concerning core deliverable length and the addition of deliverables to accommodate solutions with varying cost, complexity and time constraints. Small projects are required to perform all Framework activities and core deliverables; however, the total documentation for a very small project might amount to one page, for example. How small project staff conducts the stage gate review for their projects will help them determine how they will conduct the Framework's business and technical activities and reviews. Additionally, project staff should rely on existing Department guidance documents and staff expertise relevant to small projects to determine how those projects should align and work within the Framework.

The Framework is comprised of six stages: 1) Vision; 2) Definition; 3) Construction and Validation; 4) Implementation; 5) Support and Improvement; and 6) Retirement.

Each stage consists of required key activities and core deliverables that must be completed for entry into the next stage. Appendix A is an acronym list and Appendix B, a glossary. A detailed illustration of the Framework, Departmental document references and a template for the Tailored Project Guide can be found in Appendices C-E respectively. The content of the appendices is "for information purposes only" and serves as guidance for those using this directive. Appendix C, the Framework Graphic, is a visual portrayal of the required stages, key activities and deliverables described in this directive.

The Framework stages are designated by number followed by supporting information for each stage. The sections in the text are numbered to correspond to the six stages of the Framework. Key activities and core deliverables for each stage are explained in text format. Supporting detail for each core deliverable within a particular stage is contained in tables. The tables support the bulleted list of core deliverables in each stage by providing detail that better explain each deliverable.

Below is key information regarding each stage of the Framework.

1. VISION STAGE

The purpose of the Vision Stage is to develop a business case, necessary acquisition planning documents for the procurement of services and resources to build new IT solutions or improve existing IT assets and high-level requirements for the new system. During this process, the feasibility and cost of the project will be assessed.
The Vision Stage contains the following key activities:

- Identify needs and define project scope, define high-level requirements and prepare business case.
- Obtain appropriate reviews and approvals for the business case. This will include the OCIO's ITIM staff ensuring that the business case aligns with the Department's IT investment objectives.
- Obtain review and approval of acquisition planning activities. The CAM office will review and approve all acquisition documents.
- Obtain necessary technical reviews and approvals for the project, as envisioned. The OCIO's Technical Review Board (TRB), Security, Regulatory Information Management Services (RIMS), Planning and Investment Review Working Group (PIRWG), Enterprise Architecture (EA) and Information Assurance (IA) are examples of staff that would participate in the review and approval activities.

The Vision Stage contains the following core deliverables:

- Business case. Business case will include a high level project management plan and a project charter.
- Acquisition documents.
- Technical documents. Examples would include presentations for TRBs and EA reviews.
- Security and privacy documents. An example is the Critical Infrastructure Protection (CIP) Questionnaire.
- Tailored project guide.

The business case includes a request to the Department's senior management for support of an initiative and usually indicates the level of resource investment and financial commitment deemed necessary for the project.

The business case provides a business justification for implementing new or improved IT solutions. Table 1 contains key information for the business case.

Table 1. Business Case

Key Components		Key Roles & Responsibilities	Key Legislative/Policy Drivers
▸ Project Description and Purpose ▸ Project Charter ▸ Business Value of the Initiative ▸ Alternatives Analysis (Market Research & Alternative Solution) ▸ Recommended Solution and Justification ▸ Project Scope, Cost and Funding	▸ Performance Measurements and Risks (includes Security Risks) ▸ High-Level EA Plan ▸ High-Level Solution Acquisition Plan ▸ High-Level Project Management Plan	▸ Project manager Develops Business Case ▸ ITIM, EA, IA and Other Relevant Staff Reviews Business Case; ITIM Approves	▸ Clinger- Cohen Act ▸ OMB A-11: Preparation, Submission & Execution of the Budget ▸ OMB A-94: Guidelines and Discount Rates for Benefit-Cost Analysis of Federal Programs ▸ OMB A-130: Management of Federal Information Resources ▸ Federal Information Security Management Act (FISMA) ▸ National Institute for Standards and Technology (NIST)

Acquisition documents help identify and manage the activities of the acquisition strategy to ensure solution acquisition in a timely, efficient and effective manner. Table 2 contains key information for acquisition documents.

Table 2. Acquisition Documents

Key Components		Key Roles & Responsibilities	Key Legislative/Policy Drivers
▸ Market Research ▸ Source Selection Plan ▸ Independent Government Cost Estimate ▸ Acquisition Strategy ▸ Vendor Identification List ▸ Requisition Document ▸ Solicitation: – Statement Of Objectives (SOO) – Statement Of Work (SOW) (with appropriate LCM and security language)	▸ Procurement Action Requests ▸ IT Procurements Indicating how Specific Equipment or Resources are to be Acquired ▸ Document Hand-off strategy for Multiple Vendors ▸ Quality Assurance Surveillance Plan (QASP) ▸ Final EA Review ▸ Award Document	▸ Contracting Officer/Business Area Develops Acquisition Documents ▸ CAM Reviews and Approves	▸ Clinger- Cohen Act ▸ Federal Acquisition Regulation (FAR) ▸ 508 Compliance, (Electronic & IT Accessibility Standards) ▸ ACS Directive: Acquisition Planning (OCFO: 2-107) ▸ ACS Directive: Procuring Electronic and Information Technology (EIT) in Conformance with Section 508 of the Rehabilitation Act (OCIO: 3-105)

Technical documents will substantiate solution technical needs. These documents are presented to technical staff during the Vision Stage to obtain initial technical review and approval. Table 3 contains key information for technical documents.

Table 3. Technical Documents

Key Components	Key Roles & Responsibilities	Key Legislative/Policy Drivers
▸ Solution Functionality ▸ High-Level Functional Requirements ▸ Operational Requirements ▸ Presentation Summarizing Data Presented in Business Case and Components Above	▸ Project manager/Vendor develops Technical Documents ▸ Groups such as TRB, Security, PIRWG, EA, IA Review & Approve	▸ Clinger-Cohen Act

Security and privacy documents consist of various types of security documentation necessary for the Vision Stage. These documents contain security and privacy requirements and controls for protecting the solution. Table 4 contains key information for security and privacy documents.

Table 4. Security and Privacy Documents

Key Components	Key Roles & Responsibilities	Key Legislative/Policy Drivers	
▸ Identify Certification & Accreditation (C&A) Team ▸ Determine Initial System Security Requirement ▸ Complete CIP Questionnaire ▸ Complete a General Support System (GSS) and Major applications (MA) Inventory Form	▸ Project manager/Vendor develops Security & Privacy Documents ▸ IA reviews; C&A approves & Accepts as Part of Larger C&A Process	▸ Clinger-Cohen Act ▸ OMB A-130: Management of Federal Information Resources ▸ E-Government Act 2002 ▸ FISMA ▸ NIST ▸ ACS Handbook for IA Security Policy (OCIO-1)	▸ ACS Handbook for IT Security Risk Assessment Procedures (OCIO-7) ▸ ACS Handbook for IT Security GSS & MA Inventory (OCIO-9) ▸ ACS Handbook for IT Security Contingency Planning Procedures (OCIO-10) ▸ ACS Handbook for IT Security Configuration Management (CM) Planning Procedures (OCIO-11)

The Tailored Project Guide is a document for planning, recording and tracking the completion of required deliverables for an IT solution. All project managers will be required to develop a Tailored Project Guide to track the completion of core deliverables throughout the lifecycle. Appendix E at the end of this document is a Tailored Project Guide Template suggested for use. Project managers may develop their own tailored project guide as long as one is used to plan and track the completion of all project deliverables.

2. DEFINITION STAGE

The purpose of the Definition Stage is to define functional requirements that address both the business and technical solutions. The project team will produce a high-level functional design and a detailed solution design to be used to guide work in the Construction and Validation Stage.

The Definition Stage contains the following key activities:

- Review existing business case. Submit a Baseline Change Request to ITIM, as necessary.
- Develop and obtain approval of detailed project management plan.
- Develop high-level business, functional and security requirements.
- Develop high-level architecture.
- Obtain technical reviews and approvals. TRB, Security, RIMS, EA, IA are examples of entities that would participate in review and approval activities.
- Design solution.

The Definition Stage contains the following core deliverables:

- *Review previous deliverables and update as necessary.*
- Project management plan.
- Configuration management (CM) plan.
- Requirements documentation.
- Design documentation.
- Security and privacy documentation. Business continuity plan, disaster recovery plan, contingency plan and security risk assessment and mitigation plan are examples of security and privacy documentation.
- Test Plan.

"Review previous deliverables and update as necessary" is listed to remind project managers to review documents from the previous stage and make updates, if needed, to ensure that documents stay current with any project or solution changes. Project managers who originally developed the deliverables in question will review and update them.

Following industry standards such as, the Project Management Book of Knowledge (PMBOK), the project management plan outlines a performance-based management approach (current and estimated cost, schedule and performance goals) including project milestones and associated resources, tools, techniques and organizational roles and responsibilities.

This project management plan will define project activities throughout the lifecycle. Table 5 contains key information for the project management plan

Table 5. Project Management Plan

Key Components		Key Roles & Responsibilities	Key Legislative/Policy Drivers
▸ Project Charter ▸ Project Management Approach ▸ Scope ▸ Work Breakdown Structure (WBS) (with cost & schedule estimates and baselines) ▸ Responsibility Assignments ▸ System or Software Development Plan ▸ High-Level Risk Assessments and Plan	▸ PMBOK Subsidiary Management Plans, such as: – Communications Plan – Quality Assurance Plan ▸ Open Issues ▸ Supporting Detail: – Deliverables – Constraints and Assumptions – Relevant Standards and Policies	▸ Project manager/Vendor develops project management plan ▸ Program and Technical Staff Reviews and Approves	Clinger-Cohen Act

The configuration management plan identifies the configuration items, components and related work products that will be placed under configuration management using configuration identification, configuration control, configuration status accounting and configuration audits. This plan will establish and maintain the integrity of work products throughout the lifecycle. Table 6 contains key information for the configuration management plan.

Table 6. Configuration Management Plan

Key Components	Key Roles & Responsibilities	Key Legislative / Policy Drivers
▸ Baseline Work Products ▸ Mechanism to Track and Control Changes ▸ Change Requests ▸ Mechanism to Establish and Maintain Baseline Integrity	▸ Project manager/Vendor Develops configuration management plan ▸ IA Reviews and C&A Reviews and Accepts as Part of Larger C&A Process	▸ Clinger-Cohen Act ▸ OMB A-130: Management of Federal Information Resources ▸ FISMA ▸ NIST ▸ ACS Handbook for IT Security CM Planning Procedures (OCIO-11)

Requirements documentation consists of all the detailed requirements associated with the solution. The requirements documentation will identify and validate the business, technical, security and solution requirements. Table 7 contains key information for requirements documentation.

Table 7. Requirements Documentation

Key Components	Key Roles & Responsibilities	Key Legislative/Policy Drivers
▸ Business Requirements Accomplished by Manual Processes ▸ Technical/Systems Requirements, Accomplished by Automation ▸ Infrastructure, Accomplished by Telecommunications, Facilities and Desktop	▸ Project manager/Vendor Develops Requirements Documentation ▸ Program and Technical Staff Reviews and Approves	▸ FISMA ▸ OMB A-130: Management of Federal Information Resources

Design documentation reflects the functional and technical solutions of what will be delivered and is traceable back to the requirements. The design should be depicted through graphic models, process flows, or block diagrams –preliminary versus defined. The design documentation includes all the detailed requirements associated with the solution. The design documentation will define functional and technical components required to implement the solution. Table 8 contains key information for design documentation.

Table 8. Design Documentation

Key Components	Key Roles & Responsibilities	Key Legislative / Policy Drivers
▸ Technical Architecture: Telecommunications, hardware (HW) and software (SW) ▸ Data Architecture ▸ Entity Relationship Diagrams (ERDs) ▸ Data Dictionary ▸ Interface Specification (to Other Systems) ▸ Application Design: User Interface Input/Output, Design/Layout, System Security Management	▸ Project manager/Vendor Develops Design Documentation ▸ Program and Technical Staff Reviews and Approves	▸ OMB A-130: Management of Federal Information Resources ▸ FISMA

Security and privacy documentation will help protect the confidentiality, integrity and availability of the solution. It describes and addresses information associated with risk, risk mitigation, security requirements and controls.

Security and privacy documentation will contain detailed security and privacy requirements and controls for protecting the solution. Table 9 contains key information for security and privacy documentation.

Table 9. Security and Privacy Documentation

Key Components	Key Roles & Responsibilities	Key Legislative / Policy Drivers	
▸ Business Continuity Plan ▸ Disaster Recovery Plan ▸ Contingency Plan ▸ Risk Assessment and Mitigation ▸ System Security Plan	▸ Project manager/Vendor Develops Security & Privacy Documents ▸ IA Reviews and C&A Reviews and Accepts as Part of Larger C&A Process	▸ Clinger-Cohen Act ▸ OMB A-130: Management of Federal Information Resources ▸ E-Government Act 2002 ▸ Federal Educational Rights and Privacy Act (FERPA) ▸ FISMA ▸ NIST ▸ Privacy Act of 1974, as amended ▸ ACS Handbook for IA Security Policy (OCIO-1)	▸ ACS Handbook for IT Security Risk Assessment Procedures (OCIO-7) ▸ ACS Handbook for IT Security GSS & MA Inventory (OCIO-9) ▸ ACS Handbook for IT Security Contingency Planning Procedures (OCIO-10) ▸ ACS Handbook for IT Security CM Planning Procedures (OCIO-11)

The test plan outlines the types of testing, testing participants and timeframe for testing and provides a detailed strategy for testing the solution. Table 10 contains key information for the test plan.

Table 10. Test Plan

Key Components	Key Roles & Responsibilities	Key Legislative / Policy Drivers
▸ Organizational Structure with Roles and Responsibilities ▸ Types of Testing ▸ Testing Scenarios ▸ Timeframes	▸ Project manager/Vendor Develops Test Plan ▸ IA Reviews and C&A Reviews and Accepts as Part of Larger C&A Process ▸ Program and Technical Staff Reviews and Approves	▸ OMB A-130: Management of Federal Information Resources ▸ FISMA

3. CONSTRUCTION AND VALIDATION STAGE

The purpose of the Construction and Validation Stage is to build, test and validate the solution, transform specifications developed in the Definition Stage into an executable solution and validate solution functionality to ensure it meets or exceeds business and technical expectations.

The Construction and Validation Stage contains the following key activities:

- Build and/or acquire solution.
- Test and monitor solution. Telecommunications, applications and manual processes are aspects of the solution that project staff will test and monitor.
- Obtain security certification and accreditation.
- Obtain technical reviews and approval for implementation.
- Prepare implementation documents and maintenance and operations plan.

The Construction and Validation Stage contains the following core deliverables:

- *Review previous deliverables and update as necessary.*
- Testing documentation. A Fully Tested and Accepted Solution and test execution results and reports are examples of testing documentation.
- Implementation documents. Implementation plan, training plan, solution user manual, data conversion plan, system start-up (a.k.a. system change over plan) are examples of implementation documents.
- Maintenance and operations plan.

As in the Definition Stage, *"review previous deliverables and update as necessary"* is listed to remind project managers to review documents from the previous stage and make updates, if needed, to ensure that documents stay current with any project or solution changes. Project managers are responsible for reviewing and updating deliverables.

Testing documentation contains testing approaches and standards, provides a record of the completion of all necessary testing and helps gauge whether or not the solution meets all business and technical requirements. Testing documentation ensures that the solution is properly constructed in relation to requirements and business needs. Table 11 contains key information for testing documentation.

Table 11. Testing Documentation

Key Components	Key Roles & Responsibilities	Key Legislative/Policy Drivers
▸ Fully Tested & Accepted Solution ▸ Test Execution Results and Reports	▸ Project Manager/Vendor Develops Testing Documentation ▸ IA Reviews and C&A Reviews & Accepts as Part of Larger C&A Process ▸ Program and Technical Staff Reviews and Approves	▸ OMB A-130: Management of Federal Information Resources ▸ FISMA

Implementation documents are the plans for executing solution activities, roles and responsibilities, dependencies and timelines. Implementation documents provide guidance and consideration for all activities necessary to deploy the solution. Table 12 contains key information for implementation documents.

Table 12. Implementation Documents

Key Components	Key Roles & Responsibilities	Key Legislative/Policy Drivers	
▸ Implementation Plan ▸ Training Plan ▸ Solution User Manual ▸ Data Conversion Plan ▸ System Start-up Plan (a.k.a. System Change Over Plan)	▸ Project manager/Vendor Develops Implementation Documents ▸ IA Reviews and C&A Reviews and Accepts as Part of Larger C&A Process ▸ Program and Technical Staff Reviews and Approves	▸ Clinger-Cohen Act ▸ OMB A-130: Management of Federal Information Resources ▸ E-Government Act 2002 ▸ FISMA ▸ NIST ▸ ACS Handbook for IA Security Policy (OCIO-1)	▸ ACS Handbook for IT Security C&A Procedures (OCIO-5) ▸ ACS Handbook for IT Security Risk Assessment Procedures (OCIO-7) ▸ ACS Handbook for IT Security GSS & MA Inventory (OCIO-9) ▸ ACS Handbook for IT Security Contingency Planning Procedures (OCIO-10) ▸ ACS Handbook for IT Security CM Planning Procedures (OCIO-11)

The maintenance and operations plan establishes an approach for continued operational use and maintenance of the solution. The plan provides the processes and procedures used to maintain the solution. Table 13 contains key information for the maintenance and operations plan.

Table 13. Maintenance and Operations Plan

Key Components	Key Roles & Responsibilities	Key Legislative / Policy Drivers
▸ Plan to Maintain Technical Solution ▸ Points of Contact ▸ Notification and Escalation Process with Issues Resolution ▸ Job Execution Workflow Schedule ▸ Run Book ▸ Restart Procedures	▸ Project manager/Vendor Develops Maintenance and Operations Plan ▸ IA Reviews and C&A Reviews and Accepts as Part of Larger C&A Process ▸ Program and Technical Staff Reviews and Approves	▸ Clinger-Cohen Act ▸ OMB A-130: Management of Federal Information Resources ▸ E-Government Act 2002 ▸ FISMA ▸ NIST ▸ ACS Handbook for IA Security Policy (OCIO-1) ▸ ACS Handbook for IT Security Risk Assessment Procedures (OCIO-7) ▸ ACS Handbook for IT Security GSS & MA Inventory (OCIO-9) ▸ ACS Handbook for IT Security Contingency Planning Procedures (OCIO-10) ▸ ACS Handbook for IT CM Planning Procedures (OCIO-11)

4. IMPLEMENTATION STAGE

The purpose of the Implementation Stage is to install the new or enhanced solution in the production environment, train users, convert data as needed and transition the solution to end-users.

The Implementation Stage contains the following key activities:

- Execute implementation plan.
- Obtain program and technical review and approval to ensure successful implementation.

The Implementation Stage contains one core deliverable: the Accepted Operational/Running Solution.

The Accepted Operational/Running Solution is a fully operational solution installed in the production environment. The document associated with the solution accepted for implementation will facilitate executing the solution in the operating environment. Table 14 contains key information for the Accepted Operational/Running Solution.

Table 14. Accepted Operational/Running Solution

Key Components	Key Roles & Responsibilities	Key Legislative/Policy Drivers
▸ Execution of Implementation Plan to include: Notification of Implementation to End Users ▸ Execution of Training Plan ▸ Data Entry or Conversion ▸ Security, C&A and Post Implementation Evaluation	▸ Project manager/Vendor Oversees Installation of Solution in Production Environment ▸ Program and Technical Staff Reviews and Approves	▸ Clinger-Cohen Act ▸ OMB A-130: Management of Federal Information Resources

5. SUPPORT AND IMPROVEMENT STAGE

The purpose of the Support and Improvement Stage is to document operational and practicing procedures for solution modification and enhancement and align operational and practicing procedures with Department information technology business and technical standards.

The Support and Improvement Stage contains the following key activities:

- Operate and manage solution.
- Evaluate and enhance operations.
- Conduct annual contract review.
- Conduct annual business case review through the Capital Planning & Investment Control (CPIC) process.
- Conduct annual technical reviews. Security, RIMS, IA and EA are all examples of technical reviews.
- Update business case and budget, as necessary.
- Conduct Post Implementation Review (PIR), as necessary.

The Support and Improvement Stage contains the following core deliverables:

- *Review previous deliverables and update as necessary.*
- Amended Business Case for Solution Enhancements.

As with the Definition and Construction and Validation Stages, *"review previous deliverables and update as necessary"* is listed to remind project managers to review documents from the previous stage and make updates, if needed, to ensure that documents stay current with any project or solution changes. In the Support and Improvement Stage, however, a solution change or enhancement, depending on the magnitude, may require new deliverables—not just updates to previous ones. Project managers who originally developed the deliverables in question will review and update them. There is also the potential for new project managers or vendors to make changes or enhancements and create new deliverables.

The Amended Business Case for Solution Enhancement contains updates to the business case to reflect solution enhancements or changes. Table 15 contains key information for the amended business case.

Table 15. Amended Business Case for Solution Enhancement

Key Components	Key Roles & Responsibilities	Key Legislative/Policy Drivers
▸ Baseline Change Request for any Section of the Original Business Case Requiring Update ▸ Explanation for Change in Cost/Schedule Variance ▸ PIR Report	▸ Project manager/Vendor Submits Amended Business Case for Solution Enhancement ▸ Relevant Process Groups Review ▸ ITIM Reviews and Approves	▸ Clinger-Cohen Act ▸ OMB A-11: Preparation, Submission & Execution of the Budget ▸ OMB A-130: Management of Federal Information Resources

6. RETIREMENT STAGE

The purpose of the Retirement Stage is to execute the systematic termination of the system and preserve vital information for future access and or reactivation.

The Retirement Stage contains the following key activities:

- Develop retirement plan. Sections of the retirement plan will include shut down system or continue service decision and the data and documentation plan.
- Develop disposal plan.
- Obtain program and technical reviews and approvals for retirement and disposal plans. The OCIO's PIRWG is an example of a review board that will approve the retirement and disposal plan.
- Dispose system (at end of life) and archive SW, data and documentation.

The Retirement Stage contains the following core deliverables:

- Retirement plan.
- Disposal plan.

The retirement plan outlines activities to ensure orderly termination of the system and preservation of vital information about the system, so that information may be reactivated in the future, if necessary. It will contain the strategy for elimination, removal, or transitioning of services provided. Table 16 contains key information for the retirement plan.

Table 16. Retirement Plan

Key Components	Key Roles & Responsibilities	Key Legislative/Policy Drivers
▸ System Disposal Strategy ▸ Retirement Strategy ▸ Solution (SW, HW) Retirement Requirements List ▸ Event Tracking Procedures ▸ Data/Documentation Plan ▸ Updates to CM Plan to Track Document Versions	▸ Project manager/Vendor develops Retirement Plan ▸ Program and Technical Staff Reviews and Approves	▸ Clinger-Cohen Act ▸ OMB A-130: Management of Federal Information Resources ▸ FISMA ▸ NIST

The disposal plan emphasizes the proper preservation of the data processed by the solution, so that it can be effectively migrated to another solution or archived and restored in accordance with applicable record management regulations and policies.

The disposal plan will outline the strategy for termination of a solution's HW and SW. Table 17 contains key information for the disposal plan.

Table 17. Disposal Plan

Key Components	Key Roles & Responsibilities	Key Legislative/Policy Drivers
▸ Identify how the Termination of the Solution/ Data will be Conducted and When ▸ Solution Termination Date ▸ SW Components to be Preserved ▸ Data to be Preserved ▸ Disposition of Remaining Equipment ▸ Archiving of Lifecycle Products	▸ Project manager/Vendor develops Disposal Plan ▸ Program and Technical Staff Reviews and Approves	▸ Clinger-Cohen Act ▸ OMB A-130: Management of Federal Information Resources ▸ FISMA ▸ NIST

APPENDIX A: ACRONYM LIST

(For information purposes only)

ACRONYM	DESCRIPTION
ACS	Administrative Communications System
CAM	Contracts and Acquisition Management
C & A	Certification and Accreditation
CCRB	Change Control Review Board
CIO	Chief Information Officer
CIP	Critical Infrastructure Protection
CM	Configuration Management
CPIC	Capital Planning and Investment Control
DST	Development Services Team
EA	Enterprise Architecture
EIT	Electronic and Information Technology
ERD	Entity Relationship Diagram
FAR	Federal Acquisition Regulation
FERPA	Family Educational Rights and Privacy Act
FISMA	Federal Information Security Management Act
FSA	Federal Student Aid
GSS	General Support System
HW	Hardware
IA	Information Assurance
IM	Information Management
IT	Information Technology
ITIM	Information Technology Investment Management
ITMRA	Information Technology Management Reform Act
LCM	Lifecycle Management
MA	Major Application
NIST	National Institute for Standards and Technology
OCFO	Office of the Chief Financial Officer
OCIO	Office of the Chief Information Officer
OMB	Office of Management and Budget
PIA	Privacy Impact Assessment
PIR	Post Implementation Review
PIRWG	Planning and Investment Review Working Group
PMBOK	Project Management Book of Knowledge
PMP	Project Management Plan
PO	Principal Office
PWS	Performance Work Statement
QASP	Quality Assurance Surveillance Plan
RIMS	Regulatory Information Management Services
SDLC	Systems Development Lifecycle
SOO	Statement of Objectives
SORN	System of Records Notice
SOW	Statement of Work
SW	Software
TRB	Technical Review Board
WBS	Work Breakdown Structure

APPENDIX B: GLOSSARY

(For information purposes only)

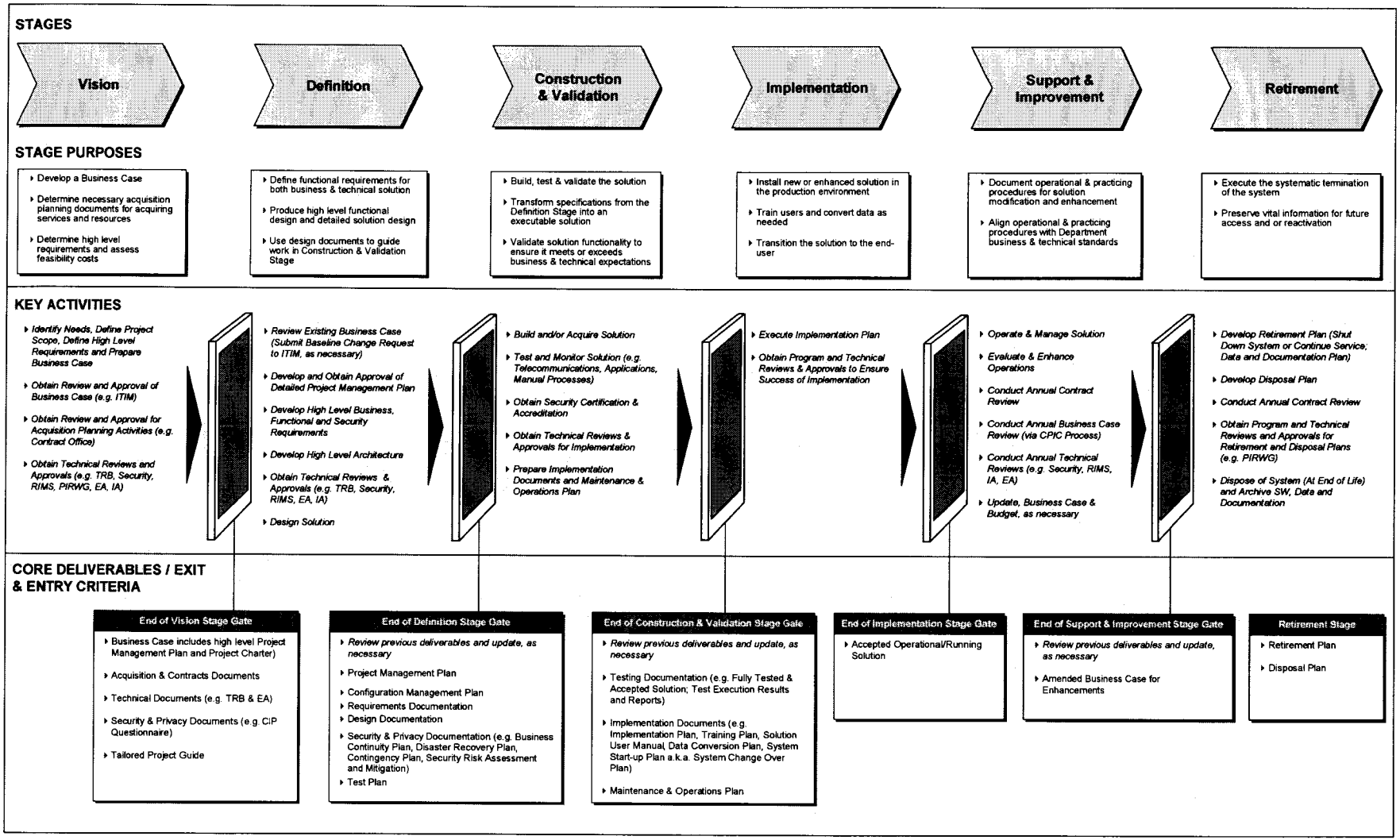
TERM	DEFINITION
Business Area	The office or offices within the Department responsible for managing an IT solution and whose purpose will be to support that business function.
Capital Planning and Investment Control (CPIC)	This process is an integrated approach to managing Information Technology (IT) investments.
Certification and Accreditation (C&A)	This activity entails a comprehensive analysis of the technical and non-technical security features and other safeguards of an IT solution to establish the extent to which a particular solution meets a set of specified security requirements.
Clinger-Cohen Act	This public law is formerly known as the Information Technology Management Reform Act or ITMRA. It requires each agency to undertake capital planning and investment control by establishing a process for maximizing the value and assessing and managing risks of IT acquisitions of the executive agency.
Contract Office	Departmental offices (i.e. CAM or FSA's contract office) that review and approve acquisition planning documents.
Core Deliverable	A document that must be completed and approved by the end of a particular stage.
E-Government Act of 2002	This public law requires agencies to develop performance measures for implementing e-government. In addition, the act requires agencies to conduct and submit to OMB, Privacy Impact Assessments (PIAs) for all new IT investments administering information in identifiable form collected from or about members of the public. (Refer to the CPIC process for more information).
Enterprise Architecture (EA)	This functional area provides resources and processes to help the Department link its business needs with the best available technologies. EA helps the Department accomplish more with existing resources by using common or shared technology features to deliver needed capabilities faster, reduce new technology risks and free key program staff to focus on more important work.
Exit/Entry Criteria	The required Framework deliverables that must be completed and approved to exit one stage and enter the next.
Federal Information Security Management Act (FISMA) of 2002	Federal legislation that requires agencies to integrate IT security into their capital planning and enterprise architecture processes at the agency, conduct annual IT security reviews of all programs and systems and report the results of those reviews to OMB.
Family Educational Rights and Privacy Act (FERPA)	A Federal law that protects the privacy of student education records. The law applies to all schools that receive funds under an applicable program of the U.S. Department of Education.
508 Compliance	A section of the Rehabilitation Act that requires compliance with the

TERM	DEFINITION
	Electronic and Information Technology Accessibility Standards.
Framework	A structured approach of required stages, key activities and core deliverables that provides a foundation for aligning existing interrelated processes within the Department—regardless of system lifecycle methodology employed.
General Support System (GSS)	An interconnected information resource under the same direct management control that shares common functionality. A system normally includes hardware, software, information, data, applications, communications, facilities and people. It provides support for a variety of users or applications, or both.
Information Assurance (IA)	The continuous application of security policies, procedures and processes that protect and defend information and information resources from unauthorized disclosure, modification or denial of services to authorized consumers.
Information Technology (IT)	A term used to describe equipment or an interconnected system or subsystem of equipment, which is used in the automatic acquisition, storage, manipulation, management, movement, control, display, switching, interchange, transmission, or reception of data by an executive agency.
Information Technology Investment Management (ITIM)	A process area within the Department that provides an integrated management mechanism for the continuous selection, control and evaluation of investments in information systems and resources over the course of their lifecycles. (Refer to the Department's ITIM Process Guide for more information).
Key Activity	Any task, procedure or process that enables and supports the development and/or approval of a core deliverable (see definition for core deliverable above).
Key Component	Critical documents, sections of documents or categories of information that pertain to a core deliverable.
Lifecycle Management (LCM)	The coordination of activities associated with the implementation of information systems from conception through disposal, which include defining requirements, designing, building, testing, implementing and disposing of systems.
Major Application	An application that requires special attention to security due to the risk and magnitude of the harm resulting from the loss, misuse, or unauthorized access to, or modification of, the information in the application.
National Institute for Standards and Technology (NIST)	This organization is a non-regulatory Federal agency within the U.S. Commerce Department's Technology Administration division. NIST's mission is to develop and promote measurement, standards and technology to enhance productivity, facilitate trade and improve the quality of life.
OMB Circular A-11	The title of this legislation is "Preparing, Submitting and Executing the Budget." A-11 provides guidance on preparing the Fiscal Year Budget submissions for Presidential review and includes instructions on budget execution.
OMB Circular A-94	The title of this policy is "Guidelines and Discount Rates for Benefit-Cost Analysis of Federal Programs." A-94 offers guidelines to promote efficient

TERM	DEFINITION
	resource allocation through well-informed decision-making.
OMB Circular A-123	The revised version of this policy will have the title, "Management's Responsibility for Internal Control," and is effective as of FY 2006. This legislation defines management's responsibility for internal control in Federal agencies and has a strong emphasis on financial reporting, as opposed to IT Capital Planning.
OMB Circular A-130	The title of this policy is "Management of Federal Information Resources," A-130, provides information resource management policies on Federal Information Management/Information Technology (IM/IT) resources. The ED OCIO recommends that all offices investing in IT resources become familiar with OMB A-130.
Paperwork Reduction Act of 1995	Federal legislation intended to minimize the paperwork burden resulting from the collection of information by or for the Federal government in an effort to reduce cost by better managing Federal government information.
Principal Office (PO)	Offices within the Department which are responsible for ensuring that they develop automated systems that use information technology in accordance with the Framework.
Planning and Investment Review Working Group (PIRWG)	Department governing body that conducts IT investment analysis reviews and evaluates IT investments and makes recommendations to the CIO. The PIRWG also advises the CIO on Strategic IT investment management issues.
Privacy Act of 1974, as amended	All Department IT systems processing data that is protected under the Privacy Act must have measures implemented to protect individually identifiable information. Interconnecting systems owned by other departments and agencies that process Department data must also be considered. Protection measures must consist of management, technical and operational controls and ensure an acceptable level of risk. An acceptable level of risk should be determined in accordance with the Department's Risk Management Procedures.
Process Guides	Documents for various process areas within the Department (e.g. ITIM, TRB, CCRB).
Project Manager	Staff person who is responsible for creating deliverables and ensuring that business and technical reviews are executed and required deliverables are completed. This individual is also responsible for managing the day-to-day operations of the Department's IT solutions.
Quality Assurance (QA)	A discipline within project management to objectively monitor control and ensure the completion of key activities and required core deliverables throughout the lifecycle.
Solution	A term to describe all automated information systems, software applications and manual processes at the Department (see System below).
Stage	Definitive sections of the lifecycle that indicate a specific purpose or goal (e.g. Vision Stage, Design Stage). The end of each stage is marked by a "stage gate," which marks the exit from one stage and entry into the next.

TERM	DEFINITION
Stage Gate Review	The integration of various business and technical reviews that ensures core deliverables (and any additional deliverables) required for that stage have been completed.
Tailored Project Guide	A document to be used by program and project managers to plan, record and track the completion of all deliverables required for that solution. Project managers should list all Framework core deliverables and any additional required deliverables for their solution.
System	A collection of components (hardware, software, interfaces) organized to accomplish a specific function or set of functions; generally considered to be a self-sufficient item in its intended operational use.
Technical Review Board (TRB)	Department governing body whose purpose is to govern the technical aspects of new systems development that might affect the performance of the many client and enterprise systems, infrastructure, data and general integrity of the Department's network (EDNet).
User	An individual or organization operating or interacting directly with the system; one who uses the services of a system.

APPENDIX C: LCM FRAMEWORK 1.0 GRAPHIC



APPENDIX D: DEPARTMENTAL DOCUMENT REFERENCES

(For information purposes only)

DOCUMENTATION	OFFICE	POINT OF CONTACT (POC)	EDNET LINK
Acquisition Planning ACS Directives	Contracts and Acquisition Management (CAM)	Cynthia Bond (cynthia.bond@ed.gov)	http://connected1.ed.gov/po/om/executive/acs/alpha.html *
Change Control Review Board (CCRB) Process Guide	Security and Reliability Assurance Team	Manny Hernandez (manny.hernandez@ed.gov)	http://wdcrobiis09/doc_img/guide_ccrbprocessv9_0.pdf
Policy and Procedures: ConnectED	Development Services Team (DST)	Sally Budd (sally.budd@ed.gov)	http://connected.ed.gov/doc_img/policy_proc.doc
Enterprise Architecture Guidance	Enterprise Architecture	Joe Rose (joseph.rose@ed.gov)	http://connected1.ed.gov/po/ea/index.html
A Guide to the Information Collection Clearance Process	Regulatory Information Management Services	Jeanne Van Vlandren (jeanne.vanvlandren@ed.gov)	http://wdcrobiis08/doc_img/ticol.doc
ITIM Policy ACS Directive (Draft: Pending Approval)	Information Technology Investment Management (ITIM) Office	Wanda Davis (wanda.davis@ed.gov)	http://connected1.ed.gov/po/om/executive/acs/alpha.html *
System Security Plan Template	Information Assurance (IA)	Jerry Davis (jerry.davis@ed.gov)	http://connected.ed.gov/doc_img/System%20Security%20Plan%20Template%20102903%20v1%201.doc
IT Security Systems Development Lifecycle (SDLC) Integration Guide	IA	Jerry Davis (jerry.davis@ed.gov)	http://connected.ed.gov/doc_img/SDLC%20Security%20Integration%20Guide%20v3.doc
Information Assurance (IA) ACS Directives	IA	Jerry Davis (jerry.davis@ed.gov)	http://connected1.ed.gov/po/om/executive/acs/alpha.html *
TRB Process Guide, 9.1	Production Operations	Renaldo Harper (renaldo.harper@ed.gov)	http://connected/index.cfm?navid=225

*Link is to the ACS Directives library on ConnectED.

APPENDIX E: TAILORED PROJECT GUIDE TEMPLATE

(For information purposes only)

Revision #

1. Visions Stage	
Core Deliverables	**Notes**
Business Case	
Acquisition Documents	
Technical Documents (e.g. TRB, EA)	
Security and Privacy Documents	
Tailored Project Guide	
Additional Deliverables	

2. Definition Stage	
Core Deliverables	
Review previous deliverables and update as necessary	
Project Management Plan (PMP): Scope, Cost, Schedule, Quality, Staffing, Communications, Risk and Procurement.	
Configuration Management Plan (CM Plan)	
Requirements Documentation	
Design Documentation	
Security and Privacy Documentation	
Test Plan	
Additional Deliverables	
RIMS Deliverables: (consult the Department's "A Guide to the Information Collection Clearance Process" about whether your solution requires RIMS deliverables)	
• Systems of Record Update	
• Privacy Impact Assessment (PIA)	
• Information Collection Clearance	
• System of Records Notice (SORN)	

3. Construction and Validation Stage	
Core Deliverables	
Review previous deliverables and update as necessary	
Testing Documentation	
Implementation Documents	
Maintenance and Operation Plan	
Additional Deliverables	

4. Implementation Stage	
Core Deliverables	
Accepted Operations / Running Solution	
Additional Deliverables	
5. Support and Improvement Stage	
Core Deliverables	
Review previous deliverables and update as necessary	
Amended Business Case for Solution Enhancements	
Additional Deliverables	
6. Retirement Stage	
Core Deliverables	
Retirement Plan	
Disposal Plan	
Additional Deliverables	