Design Phase Procedures

Version 1.1

June 2011
## Version History

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<td>Chris Niedermayer</td>
<td>December 20, 2010</td>
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1. Design Phase

The Department of Housing and Urban Development’s (HUD) Project Planning and Management (PPM) Life Cycle is the rigorous application of sound investment project management principles and best practices for organizing and managing information technology (IT) project. As a component of HUD’s overarching Information Technology Management (ITM) Framework it provides the context for the HUD IT governance process and describes the interdependencies between project management, investment management, and capital planning components.

The PPM Life Cycle covers all aspects of a project from the initial development of an idea through to its decommissioning. Because there is wide variance in the methods, techniques and tools needed to support an IT solution, the PPM Life Cycle is flexible and can be tailored to address the needs and requirements of each individual project regardless of its size. It aims to capture the minimum level of detail necessary to ensure project success. Each project, working in conjunction with the Office of the Chief Information Officer (OCIO), will capture decisions around PPM Life Cycle tailoring in the Project Process Agreement (PPA), which documents the reasons for using, combining, or skipping specific artifacts applicable to the project.

The PPM Life Cycle applies to all HUD IT projects, including but not limited to:

- New projects
- Major enhancements to existing projects
- Projects associated with operations and maintenance investments
- High-priority, fast-track IT projects
- New commercial-off-the-shelf (COTS) product acquisitions

There are seven major phases of the PPM Life Cycle; artifacts are created for each phase. These artifacts are interrelated, either rolling up other artifacts, or building upon a concept to define a lower level of detail.

This document addresses the processes and related procedures for the Design Phase, the third phase in the PPM Life Cycle.

**Figure 1 - The Design Phase Relative to the Entire PPM Life Cycle**

The purpose of this document is to:

- Provide a detailed description of the phase
- Identify the tasks and activities that take place during the phase
- Give guidance and templates on completing the tasks and activities required to exit the phase
- Detail the roles and responsibilities associated with completing each of the tasks and activities for this phase
1.1 Design Phase Description

The Design Phase takes as its initial input the requirements identified in the approved Requirements Management Plan, Requirements Definition document, and Requirements Traceability Matrix. (These requirements documents are a part of the Definition Phase package approved by the Technical Review Sub-Committee (TRC), Customer Care Committee (CCC), or the Executive Investment Board (EIB) at the Definition Phase control gate review.)

For each requirement, a set of one or more design elements are produced from interviews, workshops, and/or prototype efforts. Design elements describe the desired solution or service features in detail and may include functional hierarchy diagrams, screen layout diagrams, tables of business rules, business process diagrams, security features, pseudo-code, integration requirements, and a complete entity-relationship diagram with a full data dictionary. These design elements describe the solution in sufficient detail such that skilled programmers may develop the solution with minimal additional input. The output of this stage describes the new solution as a collection of modules or subsystems.

A formal review of the high-level architectural design documented in the Solution Architecture document is conducted prior to detailed design of the solution to achieve confidence that the design satisfies the system requirements and conforms with HUD’s enterprise architecture and prescribed design standards. The review also verifies that the Solution Architecture document raises and resolves any critical technical and/or project-related issues, as well as identifies and mitigates project, technical, security, and/or business risks affecting continued detailed design and subsequent PPM Life Cycle activities.

The technical design team may include the following roles: lead solution architect, system development lead, server manager, network manager, database administrator, records manager, and Section 508 coordinator. A single individual may be assigned multiple project team roles and not all roles will be applicable to every project.

Both the development and test teams develop the initial strategy for testing the system. This strategy includes plans for unit and integration tests, security tests, as well as the user acceptance tests that will be performed during the Execution of Solution Phase. The testing strategy enables the evaluation of the security controls needed to support the certification and accreditation of the system. The integrated project team (IPT) estimates the required resources to support the test strategy and associated test plans.

The training needs of the test team, as well as those of the operations project team are considered, and plans are developed to produce the necessary training modules and manuals to meet these needs.

Based on information acquired in this phase, the IT project manager (PM) in collaboration with the IPT updates the Project Schedule (WBS) to reflect modifications to previously-defined tasks, incorporate new tasks for current and future phases, adjust resource requirements and allocations, and, record estimated and actual costs. The Project Management Plan and Risk Management Plan are updated to reflect any affects that the design, development, testing, and training efforts may have on the project.

The Design Phase ends with a control gate review to determine the project’s readiness to proceed to the Execution of Solution Phase.
1.1.1 High-Level Task Process Flow

Figure 2 Design Phase Process Flow
1.1.2 Entry Criteria/Input

Before the Design Phase can begin, the governance body (ies) must have reviewed the Definition Phase package and given approval for the project to begin the Design Phase. The Definition Phase package varies depending on the size and complexity of the project, and may include:

- Request for Contract Services (HUD 720 Package), if necessary
- Requirements Management Plan
- Requirements Definition document
- Requirements Traceability Matrix
- Solution Architecture document
- Project Business Value Analysis
- Quality Assurance Plan
- Project Process Agreement (Tiers 1, 2, and 3)
- Security and privacy artifacts
- Full Project Schedule (Work Breakdown Structure)
- Project Management Plan
- Risk Management Plan
- Risk Management Log
- Acquisition Strategy
- Change Management Log
- Configuration Management Plan
- Communications Management Plan
- Staffing Management Plan
- Capacity Plan
- Concept of Operations
- Lessons Learned
- Decision by TRC/CCC/EIB to proceed to the Design Phase

1.1.3 Control Gate Review Criteria

In order to pass through the Design Phase control gate, the project team must receive approval of the Design Phase Package from the governance board(s). The Design Phase package varies depending on the size and complexity of the project, and may include:

- Technical Design document
- Independent Verification and Validation Plan
- Data Conversion Plan
- Interface Control document
- Release Plan
- Implementation Plan
- System of Record Notice
- Training Plan
- Test Plan
1.1.4 Tasks

The following tasks take place in the Design Phase:

- T3-1 Procure Resources
- T3-2 Develop Technical Design and Interface Control Documents
- T3-3 Update Security Documents
- T3-4 Develop Release Plan
- T3-5 Develop Testing Strategy
- T3-6 Develop Training Strategy
- T3-7 Develop Implementation Strategy
- T3-8 Develop Data Conversion Strategy
- T3-9 Configure the Development, Test, Training, and Production Environments
- T3-10 Update the Project Schedule and Other Project Artifacts
- T3-11 Compile and Submit Design Phase Package for Go/No Go Decision
1.2 Design Phase Task Descriptions

T3-1 Procure Resources

What Happens?

If contractor services are required to complete the Design Phase activities, the contractor team is procured and assembled. The hardware and software resources required to deploy the design, development, testing, training, and production environments and support the associated activities are identified. These resources are purchased or otherwise procured.

Who Does What?

If contract resources are to be procured for the Design Phase, the procurement team submits the request(s) for contract services, reviews and negotiates contractor proposals and awards task order(s) to suitable contractor team(s) in accordance with the steps outlined in the Federal contracting guidelines and task order guidelines. The procurement team includes the government technical representative (GTR) and/or government technical monitor (GTM), business PM, IT PM, and other IPT member.

The GTR gathers the Definition Phase package approved by the governance bodies and forwards it to the IPT. The procurement team, with input from the technical design team (lead solution architect, solution development lead, server manager, network manager, records manager, Section 508 coordinator) use the approved Solution Architecture document, Configuration Management Plan, Capacity Plan and information in any issued task order(s) to identify and initiate the purchase of any needed hardware and/or software. The steps laid out in the HUD enterprise architecture standards and guidelines and the HUD IT Service (HITS) Request Management Board (HRMB) process are used to guide the procurement activities.

What Comes in?

- Approved Definition Phase package

What Controls Need to be Used?

The IPT utilizes the controls listed below when creating the relevant artifacts:

- Federal contracting guidelines
- Request for Contract Support (HUD 720 Package) guidelines
- HUD enterprise architecture standards and guidelines
- HITS Request Management Board process guidelines

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# Design Phase Procedures

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## Detailed Tasks:

The following defines the detailed sub-tasks that take place within this task:

### T3-1.1 Prepare Request for Contract Services, HUD 720 Package

If contractor services are required to complete the Design Phase activities, the GTR or GTM, with the help of the IPT, prepares the Request for Contract Services, commonly known within HUD as the **HUD 720 Package**, for work that will be completed in the Design Phase. The **HUD 720 Package** contains the statement of work (SOW), **Total Cost of Ownership Estimates**, Section 508 compliance supplements, justification documents, contract reporting requirements, and technical evaluation factors. If the project needs contract resources for the Design Phase, the **HUD 720 Package** must be completed prior to any further progress in the phase.

### T3-1.2 Issue Task Order(s)

The GTR and the IPT review, negotiate, and sign the contracts. The GTR issues the task order(s).

The process for reviewing and negotiating contractor proposals and awarding task order(s) to suitable contractor team(s) is conducted in accordance with the steps outlined in the Federal contracting guidelines and task order guidelines.

### T3-1.3 Assemble Project Team

The IT PM and the system development lead uses the information in the issued task order(s) and the completed statement(s) of work to assemble the technical design team.

### T3-1.4 Identify Hardware and Software Needs

The IT PM, with input from the lead solution architect, solution development lead, and other technical design team members, reviews the **Solution Architecture** document, **Configuration Management Plan**, **Capacity Plan** and information in any issued task order(s) to identify the hardware/software needed to fulfill the requirements of the solution to be implemented.

The team estimates the impact of the requirements on existing system, networking, telecommunications, and workstation infrastructure. For instance, the team may assess the number of users for the solution/service and determine new workstation software requirements or evaluate estimated changes to traffic flow and network capacity to arrive at communications
or network hardware requirements. For each item of hardware or software to be procured, the team identifies the performance, functional, and security requirements it must meet as well as the preferred vendor(s). The team also identifies expected maintenance requirements if the additional hardware/software will cause a significant change in the current maintenance schedule.

The team includes all environments – design, development, testing, training, and production – in its assessments. The team revisits and refines this assessment of hardware/software needs throughout the Design Phase as the detailed system design may reveal new or changing infrastructure needs. HUD’s Office of Information Technology (OIT) is consulted as necessary when performing this task.

T3-1.5 **Purchase Hardware and Software** – The IT PM, with input from the procurement team and assistance from the HUD Information Technology Services team, initiates the procurement of the required hardware and software. The steps laid out in the HUD enterprise architecture standards and guidelines and the HITS Request Management Board (HRMB) process are used to guide the procurement activities.
T3-2 Develop Technical Design and Interface Control Documents

What Happens?
The Technical Design and Interface Control documents are created.

Who Does What?
The IT PM with input from the lead solution architect, solution development lead, database administrator and other technical design team members creates the Technical Design document.

The IT PM, business PM, solution development lead, requirements lead and other IPT members review the solution requirements and identify the interfaces required to support the requirements. The team documents the interfacing requirements in the Interface Control document.

The IT PM, business PM, IT security specialist, and other IPT members review the Technical Design and Interface Control documents to ensure that they support the requirements and form a sound basis for development work.

What Comes in?
- Requirements Definition document
- Solution Architecture document
- Capacity Plan
- Configuration Management Plan

What Controls Need to be Used?
- Federal records management guidelines
- Design standards and guidelines

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**Detailed Tasks**

The following defines the detailed sub-tasks that take place within this task:

**T3-2.1 Establish Architecture** – The lead solution architect, solution development lead, database administrator, and other technical design team members establish a high-level architecture of the solution. The architecture identifies items of hardware, software, and manual operations. All the solution requirements are allocated among the hardware and software configuration items. This information should be in alignment with the information supporting the purchase of hardware and software.

**T3-2.2 Establish Security Architecture** – The solution development lead, IT security specialist, lead solution architect, database administrator, and other technical design team members document the security architecture, including integrity controls.

**T3-2.3 Create Detailed Design** – The system development lead, lead solution architect, database administrator, and other technical design team members provide the information needed for the development team to actually build and integrate the hardware components and code, integrate the software modules, and interconnect the hardware and software segments into a functional product. Additionally and if applicable, they address the detailed procedures for combining separate commercial-off-the-shelf (COTS) packages into a single solution. The team maps every detailed requirement to the Requirement Definition document and Requirements Traceability Matrix.

**T3-2.4 Document Technical Design** – The solution development lead, lead solution architect, database administrator, and other technical design team members use the accepted Requirement Definition document, Solution Architecture document, and Capacity Plan to create the Technical Design document. The IPT uses the steps laid out in the Technical Design template, template instructions, and checklist to create the Technical Design document.

**T3-2.5 Identify System Interfaces** – The solution development lead, lead solution architect, database administrator, and other technical design team members identify the system’s interfaces with other application software, including those from other operational organizations. For each interface, the team identifies:

- Type of interface, such as operator control of a terminal or program interfaces with other programs
- Description of operational implications of data transfer, including security considerations
- Data transfer requirements to and from the subject program (including data content, sequence, timing, format, volume, and processing)
- Current formats of interchanged data
- Interface procedures, including telecommunications considerations
- Interface equipment
- Data conversion requirements
T3-2.6 **Document Interface Control** – The solution development lead, lead solution architect, database administrator, and other technical design team members use the accepted *Requirements Definition* document, *Solution Architecture* document, and *Capacity Plan* to create the *Interface Control* document. The IPT uses the steps laid out in the *Interface Control* template, template instructions, and checklist to create the *Interface Control* document.

T3-2.7 **Conduct Interim Reviews** – The solution development lead, IT PM, business PM, requirements lead, and other IPT members conduct ongoing interim reviews of the solution design as it evolves through the Design Phase. This review determines whether the initial design concept is consistent with the overall architecture and satisfies the functional, security, and technical requirements in the *Requirements Definition* document.
T3-3  Update Security Documents

What Happens?
The project’s security and privacy measures are updated, reviewed, and approved. The security and privacy assessments are conducted to ensure that the project will be adequately protected from external and internal security threats.

Who Does What?
The business PM, IT PM, IT security specialist, and solution development lead update the security and privacy artifacts created in the previous phases.
The IT security specialist, along with the IT PM, assesses the threats and vulnerabilities and completes the security and risk assessment in the Cyber Security and Assessment Management (CSAM) tool following the Federal and HUD security and privacy standards and guidelines.
The IT security specialist and IT PM update the Security Plan and E-Authorization in CSAM following the Federal and HUD security and privacy standards and guidelines.
The privacy lead and IT PM update the Privacy Impact Assessment (PIA) following the Federal and HUD security and privacy policies, standards, and guidelines.
The IPT conducts a peer review following the Federal IT security and privacy standards and guidelines and HUD IT security and privacy policies, standards, and guidelines.

What Comes in?
- Approved Definition Phase package
- Solution Architecture document
- Technical Design document
- Interface Control document
- Data Conversion Plan

What Controls Need to be Used?
Users of the PPM Life Cycle utilize the controls listed below when creating the relevant artifacts:
- HUD IT security and privacy standards and guidelines
- Federal IT security and privacy standards and guidelines
- CSAM guidelines and procedures
- Privacy Impact Assessment Template

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### Detailed Tasks:

The following defines the detailed sub-tasks that take place within this task:

**T3-3.1 Update Security Risk Assessment** – The IT security specialist, business PM, and IT PM update the security risk assessment addressing the following components: assets, threats, vulnerabilities, likelihood, consequences, and safeguards. The risk assessment evaluates compliance with baseline security requirements, identifies threats and vulnerabilities, and assesses alternatives for mitigating or accepting residual risks. The team completes the assessment in CSAM following the Federal and HUD security and privacy standards and guidelines.

**T3-3.2 Update Security Plan** – The IT security specialist and IT PM update the Security Plan in CSAM following the Federal and HUD security and privacy standards and guidelines.

**T3-3.3 Update E-Authorization** – The IT security specialist and IT PM update the E-Authorization Form in CSAM following the Federal and HUD security and privacy standards and guidelines.

**T3-3.4 Update Privacy Impact Assessment** – The privacy lead and IT PM update the project’s Privacy Impact Assessment using the information in the Solution Architecture document, Technical Design document, and the Interface Control document. The artifact complies with the Privacy Impact Assessment template, template instructions, and checklist; the Federal IT security guidelines; and, HUD IT security standards and guidelines.

**T3-3.5 Conduct peer review** – The IPT conducts a peer review following the Federal and HUD security and privacy templates, standards, and guidelines. If the security and privacy artifacts require corrections/alterations, they are sent back to the project team for revision/updating.
T3-4  Develop Release Plan

What Happens?

The release strategy is developed and documented in the Release Plan if the project is utilizing a phased or incremental approach for its development and implementation. A Release Plan is unnecessary if there is only one release planned (i.e., a phased implementation is not intended).

Who Does What?

The release manager works with the IT PM, business PM, configuration manager, requirements lead, and the solution development lead to create the Release Plan.

What Comes in?

- Analysis of Alternatives (part of the Project Business Value Analysis)
- Project Process Agreement
- Requirements Definition document
- Project Schedule (WBS)

What Controls Need to be Used?

- Release Plan template, template instructions, and checklist

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Detailed Tasks

The following defines the detailed sub-tasks that take place within this task:

T3-4.1 Develop Release Strategy - The release manager works with the IT PM, business PM, configuration manager, requirements lead, and the solution development lead to document the release strategy based on the work pattern selected in the Definition Phase. The release strategy is aligned with established configuration management practices. The team determines what portions of the solution functionality will be developed and implemented in which releases and the rationale for each release.

T3-4.2 Develop a Release Plan - The release manager, with input from the IT PM, business PM, configuration manager, requirements lead, and the solution development lead, creates the
Release Plan using the information gathered in the above task. The team uses the Release Plan template, template instructions, and checklist to guide the development of the Release Plan.
T3-5  Develop Testing Strategy

What Happens?
The testing strategy is developed and documented in the Test Plan.

Who Does What?
The IT PM works with the business PM, configuration manager, requirements lead, release manager, and the system development lead to create the Test Plan.

What Comes in?
- Requirements Definition document
- Requirements Traceability Matrix
- Quality Assurance Plan
- Interface Control document
- Technical Design document
- Section 508 Compliance Plan
- Release Plan
- Security and privacy artifacts

What Controls Need to be Used?
- Test Plan Template Instructions
- Test Plan Checklist

What is Produced?

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Detailed Tasks
The following defines the detailed sub-tasks that take place within this task:

T3-5.1 Identify Testing Methods and Tools - The IT PM, solution development lead, and requirements lead analyze the requirements and design specifications to determine the appropriate methods for performing the unit, system, integration, and user acceptance system and security tests. The team identifies all tools required to perform the tests and cross-references the methodologies and tools selected with the requirements and design specifications to ensure all areas of the solution are thoroughly tested before production release.

T3-5.2 Describe Testing Tasks and Activities - Based on the determinations made in the analysis of the requirements and design specifications, the IT PM and solution development lead describes the tasks and activities that will be performed. The IT PM, requirements lead, and solution development lead cross-reference the tasks with the requirements and design documents to ensure that all necessary tasks and activities are covered.

T3-5.3 Identify Personnel Requirements - The IT PM and solution development lead identify the personnel or groups of personnel required to perform the tests. The team identifies the specific task(s) the individual/group is required to perform, timeframe needed, and any special skills required (programming language, machine familiarity, etc.)

T3-5.4 Prepare a Testing Schedule - The IT PM and solution development lead prepare a testing schedule to reflect the unit, integration, developmental security, system acceptance tests and the time duration of each. This schedule reflects the personnel involved in the test effort and the site location.

T3-5.5 Identify Software Requirements - The IT PM and solution development lead identify any software needed for the tests, including software tools or utilities, such as tape compares.

T3-5.6 Identify Equipment Requirements - The IT PM and solution development lead describe the equipment needed to perform the test including the type of equipment, the amount, the location, and the times needed.

T3-5.7 Identify Deliverable Materials - The IT PM and solution development lead list all deliverable materials, including technical and documentation, needed for the tests.

T3-5.8 Identify Site-Supplied Materials - The IT PM and solution development lead describe any materials that need to be supplied at the test site. These materials could include workstations, desks, chairs, special equipment, and office supplies, as necessary.

T3-5.9 Identify Any Security Considerations - The IT PM and solution development lead prepare a list of requirements necessary to ensure the integrity of the testing procedures, data, and test site. The team also covers special security considerations such as passwords, classifications, security or monitoring software, or computer room badges.

T3-5.10 Identify Test Evaluation Criteria – The IT PM, requirements lead, and solution development lead work with the business PM to determine the specific criteria that each segment of the system/subsystem must meet. Such criteria are described by the users of the system/subsystem and typically are a mix of functional, security, and performance requirements.
T3-5.11 **Determine User System Acceptance Criteria** - The IT PM and solution development lead work with the business PM to determine the minimum function and performance criteria that must be met for the solution to be accepted as “fit for use” by the user or sponsoring organization.

T3-5.12 **Obtain Concurrence(s) on Acceptance Criteria** - The IT PM and solution development lead work with the business PM to obtain the approval of the user or sponsoring organization on the minimum criteria the solution must meet for it to be accepted as “fit for use” by their organization.

T3-5.13 **Develop the Test Plan** – the IT PM, with input from the business PM, requirements lead, and solution development lead, develops the *Test Plan* using the information gathered in the above tasks. The team uses the *Test Plan* template, template instructions, and checklist to guide the development of the *Test Plan*.

T3-5.14 **Update the Requirements Traceability Matrix** - The IT PM and the requirements lead updates the *Requirements Traceability Matrix* (RTM) to ensure that all the test cases covered in the plan map to requirements in the RTM.
T3-6   Develop Training Strategy

What Happens?
The training strategy is developed and documented in the Training Plan.

Who Does What?
The IT PM works with the business PM, requirements lead, and the system development lead to create the Training Plan.

What Comes in?
- Requirements Definition
- Staffing Management Plan
- Technical Design document
- Security Plan
- Release Plan

What Controls Need to be Used?
- Training Plan Checklist

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Detailed Tasks

The following defines the detailed sub-tasks that take place within this task:

T3-6.1 Identify Training Methods, Techniques, and Tools – The IT PM works with the business PM to confirm the training requirements and training methods to be used for the project (e.g., whether the HUD staff will conduct the training or whether the services of a vendor will be acquired). The IT PM and business PM, with input from other IPT members, determine the training techniques to be used (e.g., computer-based instruction, self-paced written manual, peer training, hands-on practical sessions, classroom lectures, or any combination of these). The IT PM identifies the tools needed for the training, such as online terminal, training manual, classroom, and computer center.

T3-6.2 Identify Training Required for Revised Office Procedures – The IT PM works with the business PM to identify the staff training needs if the implementation of the solution will change business
procedures. The team considers solution and data criticality and sensitivity, as well as the solution’s rules of behavior (as outlined in the Security Plan), when determining staff training needs.

T3-6.3 Identify Training Required for Operational Support Staff – The IT PM works with the business PM, solution development lead, and requirements lead to determine the training required for system administrators, helpdesk personnel, and other support staff.

T3-6.4 Prepare Preliminary Training Schedule – The IT PM prepares a training schedule to include the following information:

- Planned training dates
- Names of students
- Names of instructors
- Location of the sessions

T3-6.5 Develop Curriculum – The IT PM works with the business PM and training provider to develop the training curriculum, identifying the courses, course content, target audience, and course objectives.

T3-6.6 Identify Required Resources – The IT PM works with the business PM and training provider to identify the resources required by both instructors and students for the training. Resources may include classroom and training facilities; equipment such as an overhead projector, projection screen, flipchart or visual aid panel with markers, and computer and printer workstations; and, materials such as memo pads and pencils, CDs, viewgraphs, and slides.

T3-6.7 Prepare Training Plan – The IT PM, with input from the business PM and training provider, develops the Training Plan using the information gathered in the above tasks. The Training Plan is created in accordance with the Training Plan Checklist.
T3-7  Develop Implementation Strategy

What Happens?
The implementation strategy is developed and documented in the Implementation Plan.

Who Does What?
The IT PM works with the business PM, configuration manager, requirement lead, release manager, operations manager, network manager, server manager, telecommunications manager, and the system development lead to create the Implementation Plan.

What Comes in?
- Release Plan
- Test Plan
- Training Plan
- Requirements Definition document
- Configuration Management Plan
- Technical Design document

What Controls Need to be Used?
- Implementation Plan Template Instructions
- Implementation Plan Checklist

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Detailed Tasks
The following defines the detailed sub-tasks that take place within this task:
T3-7.1 **Define Activities, Roles, and Responsibilities** – The IT PM with input from the release manager, business PM, configuration manager, and other IPT members, creates a list of activities required for deployment and the project staff (HUD or contractor) responsible for each activity.

T3-7.2 **Identify Hardware Requirements** – The release manager, with input from the IT PM, system development lead, and other IPT members, creates a list of the equipment and hardware required to support the implementation. This may include computers, servers, peripheral equipment, simulators, emulators, diagnostic equipment, other non-computer equipment, as well as any network and data communication requirements. This list should be consistent with the hardware requirements identified in the Definition Phase.

T3-7.3 **Identify Software Requirements** – The release manager, with input from the IT PM, solution development lead, and other IPT members, creates a list of the software, databases, compilers, operating systems, utilities, etc. required to support the implementation. This list should be consistent with the software requirements identified in the Definition Phase.

T3-7.4 **Develop an Implementation Plan** – The release manager works with the IT PM, business PM, configuration manager, requirements lead, and the solution development lead to create the *Implementation Plan* using the information gathered in the above tasks. The team uses the *Implementation Plan* template, template instructions, and checklist to guide the development of the *Implementation Plan*. 
T3-8  Develop Data Conversion Strategy

What Happens?
The data conversion strategy is developed and documented in the Data Conversion Plan.

Who Does What?
The IT PM works with the requirements lead, solution development lead, database administrator, and release manager to create the Data Conversion Plan. The team may also obtain input from representatives of the team(s) maintaining the source/legacy system(s).

What Comes in?
- Technical Design document
- Requirements Definition document
- Release Plan
- Legacy system data dictionary and other technical documentation

What Controls Need to be Used?
- Data Conversion Plan Template Instructions
- Data Conversion Plan Checklist

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Detailed Tasks
The following defines the detailed sub-tasks that take place within this task:

T3-8.1  Define the Data Conversion Strategy - The IT PM works with the database administrator, requirements lead, release manager, the solution development lead, and owners of the source data to develop the data conversion strategy. Activities required to create the strategy include:

- Identify the overall approach, assumptions, and processes that will be used in the data conversion.
- Develop an inventory and cross-reference of source and target data elements, schema, metadata, and all self-describing files.
- Specify the extract, transform, and load (ETL) components and functions for each data source.
- Determine the tools needed to execute the conversion.
- Develop a strategy for data quality assurance and control including remediation strategies for gaps, orphans, duplicates, etc. If necessary, include a pilot or trial execution of the target application with the converted data.
- Identify the fall back and contingency strategies.
- Determine the impact on business operations.
- Schedule meetings with stakeholders involved in sending and receiving files of the system. Discuss objectives and proposed data conversion schedule.

T3-8.2 Establish MOU(s) – Some stakeholders or owners of the source data may require that a Memorandum of Understanding (MOU) be established prior to the provision or acceptance of data for conversion. The IT PM and business PM negotiate with the owner(s) of the source data to establish the necessary MOU(s). Delays in the execution of the MOU(s) may negatively affect the data conversion process and the entire project schedule.

T3-8.3 Develop the Data Conversion Plan - The IT PM works with the business PM, database administrator, requirements lead, and the system development lead to create the Data Conversion Plan using the information gathered in the above tasks. The team uses the Data Conversion Plan template, template instructions, and checklist to guide the development of the Data Conversion Plan.
T3-9  Create/Update the Project Schedule and Other Project Artifacts

What Happens?
The Project Schedule (WBS), Requirements Traceability Matrix, and Risk Log are updated. The System of Record Notice and Independent Verification and Validation Plan are created, if necessary.

Who Does What?
The IPT uses the steps laid out in the Project Schedule (WBS) Instructions and Earned Value Management Instructions to update the Project Schedule (WBS).
The IPT uses the steps laid out in the Requirements Traceability Matrix Instructions to update the Requirements Traceability Matrix.
The IPT uses the steps laid out in the Risk Management Plan template, template instructions, and checklist, and Risk Management Log Template Instructions to update the Risk Management Log.
The IPT uses the steps laid out in the System of Record Notice template, template instructions, and checklist to create the System of Record Notice.
The IPT uses the steps laid out in the Independent Verification and Validation Plan template, template instructions, and checklist to create the Independent Verification and Validation Plan.

What Comes in?
- Project Schedule (WBS)
- Requirement Traceability Matrix
- Risk Log
- Risk Management Plan

What Controls Need to be Used?
- Independent Verification and Validation Plan template, template instructions, and checklist
- Risk Management Plan template, template instructions, and checklist
- Risk Management Log Template Instructions
- System of Record Notice template, template instructions, and checklist
- Project Schedule (WBS) Instructions
- Earned Value Management Instructions
- Requirements Traceability Matrix Instructions
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**Detailed Tasks**

The following defines the detailed sub-tasks that take place within this task:

**T3-9.1 Update Project Schedule** – The IPT uses the steps laid out in the *Project Schedule (WBS)* Instructions and *Earned Value Management Instructions* to update the *Project Schedule (WBS)*. The *Project Schedule (WBS)* is updated to reflect the following:
• The status of design activities and the development activity schedule for the Execution of Solution Phase
• The status of data conversion planning activities and the schedule of data conversion activities occurring in the Execution of Solution Phase
• The status of test planning activities and the schedule for testing activities in the Execution of Solution Phase
• The status of implementation planning activities and the schedule of implementation activities in the Execution of Solution Phase
• The status of training planning activities and the schedule of training activities in the Execution of Solution Phase

**T3-9.2 Update Risk Log** – The IPT uses the steps laid out in the *Risk Management Plan* template, template instructions, and checklist, and the *Risk Management Log Template Instructions* to update the *Risk Management Log*. The *Risk Management Log* is updated to reflect the following:

- The status of previously-identified risks
- New risks that were identified as the team conducted the Design Phase activities

**T3-9.3 Update the Requirements Traceability Matrix** - The IPT uses the steps laid out in the *Requirements Traceability Matrix Instructions* to update the *Requirements Traceability Matrix*. The matrix is updated to ensure that all design elements covered in the *Technical Design* document and all test cases and scenarios covered in the *Test Plan* map back to system requirements.

**T3-9.4 Update the Configuration Management Plan** - The IPT uses the steps laid out in the *Configuration Management Plan Template Instructions* to update the *Configuration Management Plan*.

**T3-9.5 Create the System of Record Notice** - The IPT uses the steps laid out in the *System of Record Notice* template, template instructions, and checklist to create the *System of Record Notice*.

**T3-9.6 Create the Independent Verification and Validation Plan** - The IPT uses the steps laid out in the *Independent Verification and Validation Plan* template, template instructions, and checklist to create the *Independent Verification and Validation Plan*. 
T3-10 Compile and Submit Design Phase Package for Go/No Go Decision

The completed and reviewed project documents are compiled into the Design Phase Package and are presented to the governance bodies for a Go/No Go control gate decision.

**Who Does What?**

The IPT compiles the Design Phase project documentation into the Design Phase Package. The package varies depending on the size and complexity of the project, and may include:

- HUD 720 Package
- Technical Design document
- Independent Verification and Validation Plan
- Data Conversion Plan
- Interface Control document
- Release Plan
- Implementation Plan
- System of Record Notice
- Training Plan
- Test Plan

Along with this package, the IPT submits a formal request to the IT governance bodies for review and approval of the project’s Design Phase artifacts.

After reviewing the project artifacts, the TRC approves the project to move into the Execution of Solution Phase, allows the project to proceed into the Execution of Solution Phase subject to certain conditions, or rejects the project. If the project is rejected, the IPT follows the appeals process to re-submit the project for review.

If the project requires additional oversight from the CCC and/or the EIB, the TRC forwards the project artifacts to the relevant governance body along with a Control Gate Review Decision Form reflecting the TRC’s recommendation.

**What Comes in?**

- Design Phase package

**What Controls Need to be Used?**

Users of the PPM Life Cycle utilize the controls listed below when creating the relevant artifacts:

- Project Design Phase Go/No Go decision meeting guidelines
- Control Gate Review Decision Form

**What is Produced?**

- Approved Design Phase package
- Decision by TRC/CCC/EIB to Proceed to Execution of Solution Phase

**Detailed Tasks:**

The following defines the detailed sub-tasks that take place within this task:
T3-10.1 Assemble Design Phase Package – The IPT compiles the Design Phase package and forwards it, along with the formal request for review, to the TRC for approval.

T3-1.1 Obtain Design Phase Go/No-Go decision – The TRC reviews the Design Phase package and:

- Approves the project to move into the Execution of Solution Phase,
- Approves the project to move into the Execution of Solution Phase with conditions, or
- Rejects the project

If the project requires additional oversight from the CCC or EIB as identified in Tier 2 of the Project Process Agreement, the TRC communicates with the chair of the appropriate body and provides the necessary documentation for review.

T3-10.2 Resolve any Conditions for Project Approval – If the TRC, CCC, or EIB has approved the project with conditions, the IPT adjudicates their comments and re-submits the changes for approval prior to moving into the Execution of Solution Phase.