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Document Purpose

This Practices Guide is a brief document that provides an overview describing the best practices, activities, attributes, and related templates, tools, information, and key terminology of industry-leading project management practices and their accompanying project management templates.

Practice Overview

The Department of Health and Human Services (HHS) Enterprise Performance Life Cycle (EPLC) is a framework to enhance Information Technology (IT) governance through rigorous application of sound investment and project management principles, and industry best practices. The EPLC provides the context for the governance process and describes interdependencies between its project management, investment management, and capital planning components. The EPLC framework establishes an environment in which HHS IT investments and projects consistently achieve successful outcomes that align with Department and Operating Division goals and objectives.

Projects often encounter major difficulties because they lack clearly defined and documented requirements. Requirements management is a systematic approach to finding, documenting, organizing, and tracking requirements and the changes that may occur. Requirements Management helps ensure that the end product meets the needs and expectations of the stakeholders. A key step in requirements management is to determine and agree upon specific requirements gathering processes, documentation of requirements, traceability, and testing expectations. Requirements are defined during the planning phase and are managed throughout the entire process from high level requirements, through detailed requirements, design, build, and test.

This Requirements Management Practices Guide provides guidelines for managing all requirements for a project and describes the details on how the requirements might be documented, organized, and managed. The intended audience of this document is the project team.

A distinction needs to be made between project requirements and product requirements.
- **Project Requirements** define how the work will be managed. This includes the budget, communication management, resource management, quality assurance, risk management, and scope management. Project requirements focus on the who, when, where, and how something gets done. Project requirements are generally documented in the Project Management Plan.
- **Product Requirements** include high level features or capabilities that the business team has committed to delivering to a customer. Product requirements do not specify how the features or the capabilities will be designed.

Requirements Definition

Requirements definition provides a solid foundation for the end product and provides the first view of what the intended product must do and clear descriptions of how it should perform. Requirements definition also provides a basis for design and serves as a foundation for testing and user acceptance of the end product. Requirements definition captures all levels of requirements and helps to ensure that the project meets its objectives within the agreed upon limitations of time, cost and functionality.

Requirements definition is used to identify the goals, needs, and objectives of the end product by asking questions like:
- What problem are we trying to solve?
- What do we need to do to solve the problem?
- How do we accomplish solving the problem?

Requirements Gathering

Requirement gathering is an iterative process that involves interacting with the client to gain consensus on the details of those requirements. There is no one perfect method for gathering and analyzing requirements. The most appropriate method for gathering requirements differs from project to project. Some commonly used techniques for gathering requirements are:

- Interviews
- Prototyping
- Use Case Analysis
- User Stories
- Workshops

Interviews

Interviews are used to gather information. However, the predisposition, experience, and skill of the person being interviewed needs to be taken into account because these elements have a tendency to prejudice information obtained in the interview. One approach to alleviating possible bias would be the use of context-free questions by the interviewer.

Prototyping

Prototyping is a technique for building a quick and rough version of a desired system or parts of that system. The prototype illustrates the system capabilities to users and designers. It serves as a communications mechanism to allow reviewers to understand interactions with the system. In some cases, prototyping can give the impression that developers are further along in the development of the project than is actually the case which can give users unrealistic project completion expectations.

Use Case Analysis

A Use Case Analysis is a narrative document that describes the sequence of events a user uses a system to complete a process. Use cases are meant to capture the intended behavior of the system being developed, without specifying how that behavior is implemented. A use case diagram can be used to depict the business functionality, at a high-level, that the system will support.

User Stories

User Stories are a simple approach to requirements gathering that shifts the focus from formal written requirements documentation to conversation that enables a project to be more responsive from its inception. User stories differ from Use Cases in that User Stories are written by the customers outlining functions that the system should be able to perform and User Stories consist of only a few sentences of written text.

Workshops

Requirements gathering workshops provide an opportunity for individual perspectives to be shared, refined, and combined in ways that will benefit and develop upon business requirements. Participants walk away with a better understanding of the issues and as a result may feel a stronger sense of commitment and ownership to the project.

Requirements Traceability

Requirements tracing is a practice defined as the ability to describe and follow the life of a requirement, in both a forward and a backward direction through the entire project's life cycle. Requirements tracing captures all levels of requirements and helps ensure that the project meets client expectations.

Requirements traceability can be considered the backbone of any project and helps ensure accurate delivery to meet client expectations. Tracing requirements through the entire life cycle provides the ability to ascertain that technical requirements have been satisfied by functional requirements that will in turn satisfy business requirements; from project scope to high level requirements to detailed design, down through coding, and testing. Requirements will differs from project to project. Some commonly identified types of requirements are:

- Functionality
- Performance
- Regulatory/Legal
- Reliability
- Supportability
- Usability

Functionality
Functionality requirements identify aspects of the desired final product such as:
- What the system should do and how the system should do it as it relates to the user's interaction with the system.

Performance
Performance requirements identify aspects of the desired final product such as:
- Response time for a transaction (minimum, average, maximum)
- Throughput (e.g., transactions per second)
- Resource utilization: memory, disk, communications, etc.

Regulatory/Legal
Regulatory/Legal requirements identify aspects of the desired final product such as:
- Compliance related requirements such as CPIC, C&A, etc.
- Federal, state, and local laws

Reliability
Reliability requirements identify aspects of the desired final product such as:
- Availability – specify % of time available (xx.xx%), hours of use, maintenance access, degraded mode operations etc.
- Accuracy – specify precision (resolution) and accuracy (by some known standard) that is required in the systems output.
- Maximum bugs or defect rate – usually expressed in terms of bugs/KLOC (thousands of lines of code), or bugs per function-point.

Availability
Availability requirements identify aspects of the desired final product such as:
- Availability – specify % of time available (xx.xx%), hours of use, maintenance access, degraded mode operations etc.

Supportability
Supportability requirements identify aspects of the desired final product's requirements that enhance the supportability or maintainability of the system being built, including:
- Coding standards
- Naming conventions
- Maintenance access

Usability
Usability requirements identify aspects of the desired final products such as:
- Required training time for users to become operationally proficient in its use
- Specify measurable task times for typical tasks
- Usability requirements based on other systems that the users know and like

Security
Security requirements identify aspects of the desired final products such as:
- Degree to which a system and it's data are protected against threats

Best Practices
- **Stakeholders** - Identify and involve stakeholders
- **Iterative Process** - Requirements management is an ongoing, iterative process conducted throughout the project lifecycle.
- **Communicate** - Communicate with stakeholders to ensure popper definition and management of requirements
- **Iterative Process** - Requirements management is an ongoing, iterative process conducted throughout the project lifecycle.
- **Review and Approve** - Defined requirements should be reviewed and approved by the business owners.

- **Clearly Documented** - Defined requirements should be centrally documented using some type of tracking system or log.
- **Unique Identifier** - Each requirement should have a unique identifier and should be recorded as a single line entry.
- **Traceability** - Traceability should be centrally documented using some type of tracking system or log.
- **Reviews** - Regular reviews of requirements and their traceability is a good project management practice. Depending on the complexity of the project, the review process can occur daily; but should happen at least weekly for even the simplest projects.

Practice Activities

Requirements Definition

The practice of requirements definition is mainly conducted in the planning phase and involves the following activities:

- *Functionality* - Defining functional requirements based on technical assumptions and/or client needs.
- *Usability* - Defining usability requirements based on technical assumptions and/or client needs.
- *Reliability* - Defining reliability requirements based on technical assumptions and/or client needs.
- *Performance* - Defining performance requirements based on technical assumptions and/or client needs.
- *Supportability* - Defining supportability requirements based on technical assumptions and/or client needs.
- *Constraints* - Defining design constraints based on technical assumptions and/or client needs.
- *Risk* - Identifying associated risk(s).
- *Communication* - Communicating regularly (at least weekly) with stakeholders about the status of requirements.
- Communicating to stakeholders that the requirement has been completed.

Requirements Traceability

The practice of requirements traceability is iterative. It is conducted throughout the system lifecycle and involves the following activities:

- *Functionality* - Defining functional requirements based on technical assumptions and/or client needs.
- *Traceability* - Setting up and maintaining a requirements traceability system.
- *Log* - Updating regularly (at least weekly) the traceability log with new information.
- *Communication* - Communicating regularly (at least weekly) with stakeholders about the status of requirements.
- *Log* - Recording data used to track the requirements in the traceability log.
- *Communication* - Communicating to stakeholders that a particular requirement has been completed