



CDC UNIFIED PROCESS JOB AID



GUIDANCE FOR ITERATIVE DEVELOPMENT USING EPLC

Purpose

The purpose of this document is to provide guidance on the practice of applying **Guidance for Iterative Development Using EPLC** and the practice overview, requirements, best practices, activities, and key terms related to this requirement.

Background

Iterative development is best defined in terms of its processes that allow for dynamic development rather than any single defined method or approach. As a result, many types of iterative development methodologies exist, some of which include: Agile, Dynamic System Development, Extreme Programming, Feature Driven Development, Incremental, Spiral, etc. Regardless of name, commonalities exist across all iterative methods and include aspects such as:

- Development is done incrementally over multiple iterations
- Iterations include some component of planning, requirements analysis, design, development, testing, documentation, and implementation
- Emphasis is placed on person-to-person communication over written documents
- Software that works is the primary measure of progress and success
- Iterations build upon lessons learned in prior iterations – a continuous improvement methodology
- Teams are self-organized and granted authority to dynamically adapt to changing circumstances and are compiled in such a manner that allows for the delivery of completed, working code at the end of each iteration. Teams often include analysts, programmers, testers, writers, etc. Required facilities for deployment of the completed components are also made available as needed.

Practice Overview

The Department of Health and Human Services Enterprise Performance Life Cycle begins with the Initiation Phase and the formal identification of a business need. Once a business need is determined to be worthy of pursuing, and has been approved by the Center's Governance, the proposed project formally advances into the EPLC Concept Phase where a business case is developed. Based on review of the business case the project is approved, chartered, and funding is authorized and planning of the project begins with the creation of a preliminary Project Management Plan (PMP).

As the *preliminary* PMP is finalized, during the EPLC Planning Phase, the most appropriate approach to product development must also be identified, documented, and planned. Through the use of a Project Process Agreement (PPA) document, the EPLC can be tailored to accommodate a variety of projects and approaches, including those utilizing an iterative development approach.

Regardless of development approach used, to this point in the EPLC, work is very similar across methodologies. Even if utilizing an iterative development approach, planning performed to this point is rarely revisited in any major context unless material project changes impact budget, schedule, scope, or acquisition. Threshold for what constitutes a material change are defined by each Center's Governance and in some instances may be unique to the specific project.

Upon Governance approval of the PPA and finalized PMP the project formally advances into the EPLC Requirements Analysis Phase. How requirements, design, and their associated governance reviews are performed identifies the primary difference between an iterative and non-iterative development approach. When utilizing an iterative development approach it's implied, inclusive of the finalized PMP, that yet to be defined sub-components will be used across the project, and project team, to organize and deliver upon project objectives. These sub-components are often too granular for a governance review and may include items such as team schedules, policies, and processes for individual functional teams; resource pools management techniques, inter-team dynamics, base architectures, database schemas, common programming languages, and target development platforms.



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Work in the Requirements Analysis Phase begins with the identification of *initial* requirements that includes this and other related information. Requirements are then decomposed to a product feature and/or function level and triaged for delivery based on priority. As each new iteration nears, features and functions identified for delivery in that iteration are decomposed to a level of detail that can be estimated, scheduled, designed, built, and tested within the confines of one iterative cycle. The responsibility for review of this is delegated by the Center's Governance to the identified business owner.

During the EPLC Design Phase a *Preliminary* Design Review is performed. This is a formal inspection of *high-level* design by the Center's Governance critical partners who provide a recommendation to the Center's Governance regarding the adequacy of both functional and non-functional design. The most appropriate approach for performing this review is defined by each Center's Governance and in some instances may be unique to the specific project. Some approaches may include:

- Governance's Preliminary Design Reviews conduct a full iteration reviewed at the beginning of each new iterative cycle with the management oversight of that cycle delegated to the Project Manager.
- Governance's Preliminary Design Reviews conduct a full product release cycle review that outlines the multiple iterations contained within the product release. Iterations are then reviewed at the beginning of each new release cycle with the management and oversight of all iterations contained within that approved release cycle delegated to the Project Manager.
- Governance's Preliminary Design Reviews conduct a full project review at specific increments of defined durations with the management and oversight of all iterations contained within that duration delegated to the Project Manager.
- Governance's Preliminary Design Reviews conduct a full project review at specific thresholds of project completion (% complete) with the management and oversight of all iterations contained within that threshold delegated to the Project Manager.
- Governance's Preliminary Design Reviews conduct a full project review at specific thresholds of project variance (+/-10% from baseline or budget) with the management and oversight of all iterations contained within that threshold delegated to the Project Manager.

As the EPLC Development Phase begins, iteration teams are assembled and work begins on delivering against initial requirements, as planned within the confines of the overarching approaches documented within the PMP. During the first development iteration that contains a formal product implementation an Operational Readiness Review must be performed by the Center's Governance. At this time how future Operational Readiness Reviews will be performed is also defined and may mirror an approach similar to one bulleted above.

Example of One Possible Approach to Using Iterative Methods with EPLC

John Doe's business need is approved and he is authorized by the CDC's governance committee to move forward with the development of a business case. Based on the information contained within John's business case the project is approved, chartered, and funding is authorized.

John is identified as the project's Business Owner and is responsible for ensuring that adequate financial and business process resources are made available to support the project effort. Jane Smith is identified as the Project Manager. Jane is accountable for the planning, executing, and successful delivery of project activities.

Jane starts planning the project by creating a Project Management Plan (PMP) that documents for stakeholders how the project will address and manage items such as risk, acquisition, change, configuration, requirements, communication, quality, security, schedule, etc. Jane identified that an iterative development approach is best suited for delivery of this project and completes a Project Process Agreement to tailor the EPLC as appropriate. Jane documents that the most efficient approach would be for governance to review high-level requirements and design, to ensure the project is in line with CDC goals and objectives, and allow the subject matter experts



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within each iteration team to determine the most appropriate approach of developing the actual product functionality. This is where the primary difference between iterative and non-iterative development becomes apparent, as it relates to EPLC; how, and where, throughout the project's life cycle the architecture, requirements, and design is performed. The governance committee approves Jane's iterative approach but requests that Jane provides updated documents every six months to keep them abreast of project progress and to ensure that the project remains in line with CDC goals and objectives.

To the extent possible, Jane assembles an initial set of project requirements by working with clients and other project stakeholders. These initial product requirements are prioritized in a central feature list and rough estimates are performed. Jane recognizes that the number of requirements exceed her organization's capacity to deliver them. In response, requirements are triaged and assigned an expected iteration for delivery. High-level planning is conducted, engaging subject matter experts and Critical Partners (EA, Security, Infrastructure, etc.), to identify overarching design and development requirements to ensure a level of consistency across all project activities associated with the product's development. This effort identifies and documents items such as operating systems, development languages, database schemas, communication protocols, interfaces, applications, tools, etc. These are some of the documented items that are presented during the Requirements and Detailed Design EPLC Stage Gates Reviews.

Iteration teams are assembled and work begins on delivering against initial requirements, as planned within the confines of the overarching approaches outlined within the PMP. As the project progresses through its life cycle the initial feature list is expanded and updated to include new and more detailed customer requirements discovered while working through iterations. These new requests are added to the feature list and prioritized as appropriate and adjustments are made to planned iterations as needed. Every six months Jane revisits the governance committee with updated documentation reflecting project progress against agreed upon milestones and deliverables and any resulting changes from completed project efforts. Project work and governance reviews continue in this manner as needed.

In closing, it's important to note that no one development method is appropriate for all projects. Projects are unique endeavors delivered over a finite space of time and as a result often require imaginative approaches to deliver creative results. The most appropriate approach for delivery will also be heavily influenced by the unique characteristics of the performing organization, and the project, and may not be exactly what was used to successfully deliver past projects. CDC needs to be flexible in order to adapt to the uniqueness of each project and, if necessary, adopt an appropriate development methodology. The HHS EPLC Framework recognizes, and allows, for this flexibility through the use of a Project Process Agreement document that allows for the tailoring of the EPLC Framework to meet any unique project needs and/or approaches.