Agile Methodology and the Hybrid Approach

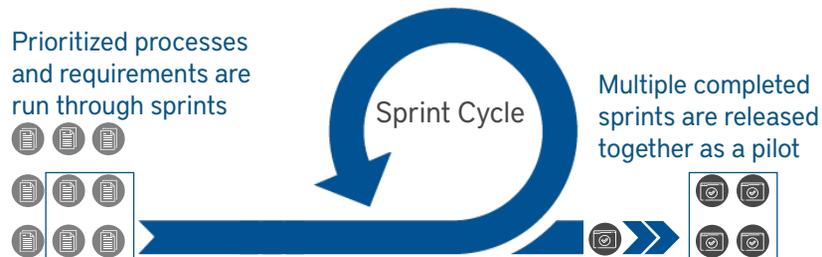Applying Agile Methodology to State, Local, and Federal Entities

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Introduction

Over the past several years, Agile methodology has become more prevalent across the software development and testing industry.[1] A 2017 survey revealed that about 52% of IT projects were classified as either Agile or some variation of the methodology.

Moving to Agile-based forms of software planning and delivery help development teams meet customer needs faster and allow for greater customer satisfaction by incorporating feedback through continuous software improvement cycles. Agile helps organizations across multiple industries – government and commercial alike – to improve product quality, time to market, and overall satisfaction for end users.[2]

Prioritized processes and requirements are run through sprints

Sprint Cycle

Multiple completed sprints are released together as a pilot

What is Agile?

Agile focuses on software delivery through small, incremental releases and iterations. Each iteration is developed by cross-functional teams consisting of business analysts, testers, Agile coaches, and developers.

Agile methodology emphasizes the rapid delivery of an application in complete functional components, or modules. Rather than creating tasks and schedules, all activities are time-boxed into phases called sprints. Each sprint has a predetermined duration (usually in weeks), with a running list of deliverables. During each sprint, team members meet at regular intervals, called stand-up meetings, to prioritize requirements and improve incremental changes to the software product based on client and user needs.[3]

How does Agile differ from Waterfall?

Unlike Agile, Waterfall follows a linear approach to application development. In a true Waterfall development project, each stage produces a distinct set of deliverables, and each stage generally finishes before the next one can begin. While Waterfall is seen as the "traditional" methodology of software development, it lacks adaptability across stages of the development life cycle and tends to take much longer to develop and implement the final solution.

Ultimately, Agile projects can deliver software faster by developing prioritized functionality in short sprints, as opposed to Waterfall projects that develop in sequential phases.

Agile Applied to State, Local, & Federal Entities

While the private sector was quick to adopt Agile methodology to their software development projects, government agencies have not embraced the approach as rapidly. However, local, state, and federal government leaders have begun adopting Agile as the new industry standard to keep up with the pace of ever-changing customer demands. Agile also offers many benefits to government agencies, including:

Increasing transparency into the progress of development teams

Driving innovation within organizations due to flexibility of approach

Enhancing teamwork via recurring meetings and ceremonies

Improving commitment and accountability to assigned tasks

Providing a robust and flexible framework to manage uncertainty

Agile implementation projects, however, do come with their set of challenges. These challenges generally fall into one of the following categories: [4]

Technical
- Difficulty establishing and maintaining technical environments
- Security and compliance concerns with iterative development
- Prioritizing speed over the quality of the technical solution

Process
- Difficulty committing staff to projects with parallel, active sprints
- Challenges for teams to manage iterative requirements
- Difficulty for staff to collaborate with project and client teams

Project Management
- Traditional status tracking does not align with Agile
- Compliance reviews difficult to execute during iterative sprints
- Difficulty for teams to transition to timely and frequent input

Agile Enterprise
- Untimely adoption of new tools and procedures
- Federal reporting guidelines do not align with Agile
- Difficulty for teams to transition to self-directed work

Hybrid Approach to Implementing Agile

Based on the challenges associated with adopting Agile methodology, many organizations are looking for a hybrid approach between Agile and the traditional Waterfall methodology, which involves a sequential and linear approach to software development. A hybrid approach combines the speed and efficiency of Agile working practices with the detailed planning and requirements gathering practices associated with the Waterfall methodology.

Advantages and disadvantages of the two development approaches are outlined below.[5]

Combining Waterfall and Agile enables development teams to utilize the best of both methodologies to intersect into a single efficient and effective approach.

Identifying the needs of the project, especially in a plan-driven environment, provides access to more adaptability and rapid delivery when implementing a hybrid approach.[6]

↻ Agile

Advantages

⊕ Constant communication with client enables compliance with requirements

⊕ Iterative development allows project to start with little upfront planning or cost

⊕ Resilient model quickly adapts to changes in requirements or test cases

Disadvantages

⊖ Fast-paced process and adaptability to changes can be difficult with a team that is unfamiliar with the approach

⊖ Lack of initial heavy design period and documentation of project requirements or scope

Waterfall

Advantages

⊕ Rigid model of execution with quality deliverables

⊕ Detailed documentation of requirements

⊕ Test cases fully defined prior to test execution

Disadvantages

⊖ Reduced time to execute development and testing due to detailed planning phase

⊖ Significant amount of time required to define detailed documentation before development can begin

⊖ Inability to gather user and client feedback throughout the development process

ESI's Approach to Software Development

ESI applies a hybrid methodology to their software delivery process, allowing for quality results through rapid execution. The ESI Approach begins with a sequential, Waterfall-like approach by gathering, defining, and verifying requirements and technical specifications with the client to meet the goals of the project. After this sequential process, ESI switches to an Agile-based approach, which includes the following activities:

Facilitating weekly stand-up meetings with the entire team to evaluate progress during the design and development stages

Iteratively gathering and incorporating client and customer feedback throughout each sprint

Conducting regular reviews with the client and prioritizing requirements for upcoming sprints

Executing ongoing tests within each sprint to verify functionality and confirm that tand confirm that each sprint is meeting the established requirements

ESI applied this hybrid approach to a project with Fairfax County. In this effort, Fairfax County sought to modernize their Personal Property Tax systems. Their current tax process was broken out into three separate modules –

one for tax payer information, one holding information of all businesses in the county, and one that includes all vehicle information for the county. ESI worked with Fairfax County to streamline this process, developing a front-end application with an integrated interface that combined all information into one module.

To ensure all Fairfax County requirements were met while maintaining the speed and agility needed for the project, ESI created quarterly plans that outlined the steps in the process for county project leads to review prior to ESI proceeding to the next phase (Waterfall) and facilitated weekly standup meetings with county project leads to inform them on project status on project status and gather feedback. (Agile).

Utilizing our hybrid approach brings together the strengths of Waterfall and Agile, while minimizing each method's weaknesses. This hybrid approach allows state, local, and federal government agencies to combine the detailed requirements, documentation, and governance of Waterfall with the speed and collaboration of Agile.

Sources

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