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# Hybrid Power: Revolutionizing IT Project Success with Agile-Waterfall Integration

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#### **ABSTRACT**

This paper discusses the hybrid Agile-Waterfall methodology in project management. It examines the logical steps for combining or using both methodologies, as each has its own advantages. This hybrid method has helped improve project outcomes, team collaboration, and stakeholder satisfaction.

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#### Introduction

Project management has evolved significantly over the past two decades as more teams, companies, and industries have started seeing its benefits and return on investment (ROI). Agile and waterfall methodologies have become widely popular, and teams use them based on the type of project and organizational structure. In this paper, we discuss bringing the flexibility of Agile and the structured planning of Waterfall to the area of project management to address challenges and improve effectiveness.

# Context

### Agile Methodology

The agile project management framework emphasizes flexibility and continuous improvement, leading to customer and stakeholder satisfaction. It breaks projects into sprints, allowing for frequent feedback and changes. It provides for iterative development and adjustments based on feedback from stakeholders. This has been a critical factor in the move-fast, fail-fast environment.

# Phases in Agile

- Backlog refinement: Review the backlog before the start of the sprint and prioritize items for the next sprint.
- Planning: Establish goals and plan the sprint.
- **Execution:** Develop and unit-test features.
- Standups: Conduct sprint review meetings to assess progress.
- **Retrospective:** Identify areas for improvement in sprint retrospective meetings. These are also called "lessons learned."

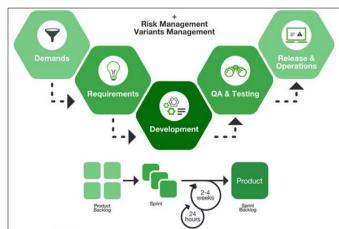
Waterfall Methodology follows a sequential and linear approach. One phase must be finished before you can start the next phase. It works best for projects where requirements are defined and signed off at the start and where no changes or additional requirements are introduced until the project goes live. If new requirements are discovered later, they are completed as a fast follower post-go-live. Waterfall provides a clear timeline at the beginning, which may change later.

#### **Phases in Waterfall**

- Analyze and Design: Gather and document all project requirements. Create the system architecture and design specifications.
- Build: Configure and develop the code, build the system, and conduct unit testing.
- Validation: Systems Integration Testing (SIT) and User Acceptance Testing (UAT) to ensure acceptance criteria are met
- **Go-Live:** The project is live in production.
- **Hypercare:** Perform support as needed.

#### **Hybrid Methodology**

A hybrid methodology combines Waterfall and Agile. It accounts for the structured planning of Waterfall and the iterative approach of Agile. This method allows for transparent project timelines at the start and can accommodate changes. It works best for large, complex projects. It works best in managing stakeholder expectations, mitigating risks, and delivering high-quality products.



**Figure** 

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#### **Main Body**

#### **Problem Statement**

Traditional project management methodologies often face many hurdles and challenges since they are not flexible and do not see the light at the end of the tunnel. Agile methodologies can suffer from scope creep since new requirements may be added. Waterfall provides transparency on the sequence but is rigid, and there is a high possibility that initial requirements may become obsolete when the product is live. These limitations warrant a hybrid approach that leverages the strengths of both methodologies.

#### Solution

Implementing a mix of both methodologies works wonders for a project. It allows for iterative development and adaptive planning while also maintaining a clear project scope with minimal scope creep and timeline changes. Agile can be used for development work in sprints, and the overall project can proceed using a waterfall approach.

## Uses

#### **Agile**

In the build phase of the project, when development work takes place, Agile can be used for adaptability. This can be used to ensure each developed item works according to the acceptance criteria through unit testing before the systems are integrated. Agile is useful for continuous improvement based on constant feedback and helps tackle complex problems.

# Waterfall

This method ensures stakeholder alignment and transparency from initial planning to requirements gathering, build, testing, and final go-live. It also accounts for a streamlined roadmap ahead of time.

#### **Impact**

# The hybrid methodology has led to

- Increased flexibility: Make sure it maintains project structure as it adapts to changes in requirements and has very few chances of a project being derailed.
- Enhanced team collaboration: It promotes continuous communication and coordination between teams, as evident from the regular agile ceremonies-daily stand-ups, sprint reviews, and retrospectives.

- Better stakeholder satisfaction: Stakeholders are always involved and aware of everything that is happening in the project. Continuous feedback helps ensure the end product meets their initial requirements.
- Minimal project overruns: Managing risks in such a way that
  project delays and budget overruns are minimal. Due to the
  hybrid methodology, issues are identified in the early phase of
  the project, which provides more time to resolve them.
- Improved quality of delivery: High-quality final products are delivered due to robust unit, regression, end-to-end, SIT, and UAT testing.

#### Scope

This hybrid methodology works best for large-scale projects that require considerable flexibility and planning. Transparent communication leads to unity among geographically dispersed stakeholders and seamless integration and completion.

#### Conclusion

Hybrid methodology provides a balanced approach to projects and project management. The combination of both addresses the limitations if only one approach is used. This case study shows ways of improving project delivery and stakeholder satisfaction. It is the best solution to the everyday challenges of modern IT project management. It ensures that projects are completed within the project timeline and allocated budget and that stakeholder satisfaction is at the highest level [1-6].

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