

waterfall delivery models and recommends the novel delivery model which enhances the productivity, clears the ambiguity, and speeds up delivery to give the advantage of time to market criteria.

Models	Effort for Completion (PDs)
Only Waterfall	32
Only Agile	13
Blend of Both Agile and Waterfall	16

Table 5. Summary of Efforts for Individual and Blended

The Waterfall model takes effort duration of 32 days and Agile model takes 13 days duration as illustrated in Table 5. The proposed fine blended model takes 16 days duration but with advantages over both agile and waterfall where individually agile or waterfall cannot give.

The software project implementation in complete waterfall model takes longer duration and higher cost and time to market delivery is not possible. Reaching customer expectations at the end of the delivery with probable deviations are also not guaranteed. This drawback addressed in proposed fine blended model where requirements gathering, development (along with system testing, load testing phases) go in parallel way and this iterative way guarantees the customer expectation and speed of the delivery in 16 days as compared to 32 days of waterfall model.

The software project implementation in complete agile model takes shorter duration and less cost and time to market delivery is quite possible. But certain complex tasks like discovery section cannot be broken down in to smaller pieces hence in the proposed blended model recommended discovery section in waterfall model to go in sequential way even though duration takes 3 days longer. Everything in agile introduces repetitive code, tech debt, re-induction of bugs, and less robustness of the system. Hence, UAT to Dev complete cycle Dev-ST-QA-UAT in sequential way to deliver robust system with bug free and no repetitive code along with important factor of reducing Technical Debt. As per proposed fine blended hybrid model, the effort duration is 16 days which is less compared to waterfall model with customer expectation and speed, optimal cost is guaranteed, and which is slightly high to agile model delivery of 13 days but system robustness, no repetitive code and Technical Debt reduction is achieved by going required and necessary phases in sequential way which is very important factor in today's world of everything agile way which is increasing technical debt unknowingly which is aptly curtailed with novel fine blended model. Hence, the proposed fine blended hybrid model achieves all the factors, customer expectations, speed (time to market), optimal cost, robust system with less technical debt.

8. Conclusion

The paper recommends the hybrid delivery model with fine blend of Agile and Waterfall delivery models with an example of software engineering project implementation.

An agile delivery model limitations are where complex activities cannot be broken down into smaller iterations. The waterfall delivery model limitations are when requirements are not clear changes in all phases are required with more rework and can run only sequentially, and takes longer time to deliver the project.

The proposed novel model in the paper addresses the drawbacks of both the models and presents the fine blend based on the requirements and suitability with which the project is delivered in time with required quality. As per the proposed model in this paper, as demonstrated in the Gantt Chart, the Discovery section is completely sequential to address the complexity. The discovery activities as represented in Gantt Chart runs sequentially because those activities cannot be broken down into smaller iterations. Hence, the proposed model recommends discovery complex activities to run sequentially. In the proposed novel model, as per Gantt Chart, where BRD/FSD is completely about gathering the requirements, hence these activities run in parallel with the development activity in an iterative way to accommodate dynamic changes which address the limitations of the waterfall model.

The software project implementation in complete waterfall model takes longer duration and higher cost and time to market delivery is not possible. Reaching customer expectations, the at end of the delivery are also not guaranteed with probable deviations. This drawback addressed in proposed fine blended model where requirements gathering, development (along with system testing, load testing phases) go in parallel way and this iterative way guarantees the customer expectation with timely feedback form customer and speeds up the delivery compared to the delivery time of waterfall model with no deviation from customer expectations.

The software project implementation in complete agile model takes shorter duration and less cost and time to market delivery is quite possible. But certain complex tasks like discovery section cannot be broken down in to smaller pieces hence in the proposed blended model recommended discovery section in waterfall model to go in sequential way even though duration takes 3 days longer. Everything in agile introduces repetitive code, tech debt, reintroduction of bugs, and less robustness of the system. Hence, UAT to Dev complete cycle Dev-ST-QA-UAT in sequential way to deliver robust system with bug free and no repetitive code along with important factor of reducing Technical Debt.

As per proposed fine blended new hybrid model, the effort duration is less compared to waterfall model with customer expectation and speed, optimal cost is guaranteed, and effort duration is slightly high of agile model delivery but system robustness, no repetitive code and Technical Debt reduction is achieved by going required and necessary phases in sequential way which is very important factor in today's world of everything agile, which is increasing technical debt unintentionally and is rightly curtailed with novel fine blended model. Hence, the proposed fine blended hybrid model achieves all the required important factors including customer expectations, speed (time to market), optimal cost, robust system with less technical debt.

9. Conflicts of interest

The authors have no conflicts of interest to declare.

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