

Enabling Agile Through Teamwork

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Abstract

For more than a decade, the Agile development process has seeped into the lives of software developers and customers, changing the way projects are planned, how teammembers and teams interact, and how customers receive their product. Agile is a teamwork heavy process, demanding superb communication and technical skills to develop projects where requirements can change the flow of the project between sprints. Similarly, Agile teams must work together on larger scale projects to ensure project success. [Summary about importance attributes of agile teamwork here.] Furthermore, [summary about importance of design/architecture here].

Keywords agile, teamwork, design, architecture, software development process

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1 Introduction

Agile development considers an element crucial to all software processes in a uniquely different manner: customers as team members. The basis of all software development is planning out a project from start to end, but requirements are prone to change when considering the fluctuating world

of technology. Agile handles change by valuing the people involved, customers and developers [5]. By interfacing with customers frequently, and considering their changing requests as the project progresses, change is a byproduct. However, the success of Agile is reliant on what Cockburn and Highsmith call "responsive people and organizations" as well as "[focusing] on the talents and skills of individuals" [4]. As a result, teamwork and communication become unavoidably ensconsed in the agile process. In this work, we first introduce a quick overview of Agile, delve into teamwork in agile, and then widen our scope to teamwork between teams in agile. Second, we discuss the importance of design and architecture within teams, where we highlight the ways they affect teamwork both positively and negatively.

2 Teams in Agile

A single team in agile consists of the product owner, the scrum master, and the developers. In order for their team to be successful, they must "have a common focus, mutual trust, and respect," be "collaborative, but speedy [in their] decision-making process" and be adept at handling ambiguity [4]. The Agile Manifesto reinforces these attributes by valuing customer collaboration and responding to change over contracts and plans [7]. Daily stand-ups incite communication, updating each other on task statuses, and conveying problems if they exist. Depending on the needs that follow the stand-up, the team will respond accordingly. e.g. team members may pair up to get a difficult or time sensitive task done.

2.1 Scaling Up Teams in Agile

As projects scale up, so does the number of teams. When considering this in an agile workspace, there is more work that must go into ensuring that teams themselves can collaborate effectively. If teams are in the same location, then promoting a collaborative environment is key. However, teams across more than one location must account for different cultures and providing as much possibility for communication as possible [6]. Distance increases the potential for misunderstandings. Other recommendations include having a single product backlog [11], cross-team daily stand-ups (and other

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cross-team activities) [10], and having communities of practice [1]. Each of these suggestions tackles a unique but very real and potential problem that occurs in large scale agile practices. Having a single product backlog allows all teams to see the whole picture, and see where work is needed. Cross-team activities allows for a deeper understanding of the project and each team's accomplishments and troubles. Finally, communities of practices creates a valuable way to share information about relevant topics from other perspectives.

3 Design and Architecture in Agile

3.1 Architecture

Organizations tend to fail if their agile process is not bounded by a fail-safe plan.

Constraints such as financial, regulatory, technical or customer driven becomes a fundamental reason for the very existence of this issue. There is a new emerging trend, which explores the possibility of using Agile practices in order to manage traditional business functions. [9]

Having a clear definition if the role of Architecture in Agile is very hard. When using SAgFe (Scaled Agile Framework), it provides us a best chance to find the usage of Architecture in an Agile environment. There are two distinct elements of Architecture in SAgFe, they are:

- Emergent Design
- Intentional Architecture

Technical basis for development and the incremental implementation of initiatives are provided by *Emergent Design*. In order to ensure the initiative continually delivers value, Emergent Design helps the Designers and Architects to be highly responsive to ever-changing customers/ stakeholders. At this juncture, Architecture in SAgFe can be seen as a collaborative and interactive exercise through which the design element can emerge.

Intentional Architecture is more of a traditional Architecture where the performance and usability of the initiative is supported and enhanced by a set of well-defined and planned Architectural initiatives. The severity and importance of the constraints such as choice of technology platform, financial budget, etc is clearly visualized using this Intentional Architecture. The probability of the initiative being successful and delivering value is increased if these constraints can be identified and incorporated into the initiative.

The key to the success of this approach is the level of abstraction at which the balance of Emergent Design and Intentional Architecture occur. The fundamental behavior that will determine this is collaboration.

Agile requires Architecture that supports the way the Agile Practices deliver of outcomes (value). The type of Architecture that will do this will be a combination of a nimble reactive style of Architecture supported by a more traditional

structured approach to Architecture. The challenge as with many things is to get the mix right! [3]

3.2 Design

Given the fact that design is an important part of a software project, yet the development team usually struggle for coming up with a right design. This happens due to many reasons such as, focusing on high-fidelity design, which in-turn forces the project to adapt waterfall approach, etc.,

As discussed in previous the section, Agile can be implemented in design process as well. This is an innovative way to increase effectiveness and overall efficiency of the development team. As agile is primarily focused on implement changes over the course of development, it is highly necessary to implement these changes to the project's design as well. It is a fundamental requirement that design has to change time-to-time in order to implement these changes in the final product.[8]

There are various ways in implementing agile process for design. They are:[2]

- Iteration modelling- Light weight modeling at the beginning of the sprint, to facilitate the team to have a better vision in forming a strategy.
- Model Storming- Just-in-time basis of modelling to think through a solution.
- Test-first Design- Writing a single before writing a production code to fulfill that test.

4 Conclusion

In this paper, we spoke about agile teams and steps taken while scaling up an agile team under different sections. Later, we took a detailed look in importance of implementing agile in various phases of a software development life-cycle, other than coding phase. After stressing out this importance, we briefly visited the ways/strategies to implement agile processes in Software Architecture and Software Design. In future, quantitative metrics can be computed from these approaches and can be compared to overall increase in efficiency of the entire software project.

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