Analysis on the Scale Agile Framework Approach

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ABSTRACT

Agile is one of the most used Software Development Methodologies used in the Software Industry currently. Agile manifesto promotes mainly the Iterative Development Team Collaboration and Change recognition. Short Iterations are used that are required for efficient Product Delivery. Traditional Methodologies does not support rapid changes in the development process. Despite the advantages of Agile, criticism on agile methodology states that it fails to pay attention to architectural and design issues. Here in the paper we will investigate one of the agile frameworks which helps us to overcome these issues which is known as SAF

*Keywords-* Agile, Agile Manifesto, Framework, Teams, Principles, Product Owner ,Scrum

**I. INTRODUCTION**

Agile Methodologies are basically iterative and incremental development approach. The four major characteristics of agile methodologies are: adaptive planning, iterative & evolutionary development, rapid and flexible response to change and promote communication [1, 2].The main principles of Agile methodologies are Welcome Changes, Deliver Frequently and Organized Teams. As it is also called as lightweight process, it will be more suitable for the development of small projects.Agile software development takes the view that teams should start with simple and predictable estimate to the final requirement and then continue to increment the detail of these requirements throughout the development Life Cycle. The main deliverables of the Agile Project are Product Vision Statement, Product RoadMap, Product Backlog, Product Release plan, Sprint Backlog, Increment. These incremental requirements refinement changes the scope of the design, coding and testing at all stages of production activity. In this way, the requirements work product is as accurate and useful as the final software itself [4].

The principle of agile software development proposes [5]

that “at regular intervals, the team reflects on how to become

more effective, then tunes and adjusts its behavior

accordingly”. In other terms it may be said that agile

methodology addresses exactly the challenges of an

unpredictable, disordered business and technology

environment [7]. Agile methodologies are used to achieve

higher quality software in a shorter period of time, self

organizing teams, customer collaboration, less documentation

and reduced time to market [8, 9]. Agile methodology

includes a family of lightweight methods that include Scrum,

Crystal Clear, Extreme Programming (XP), Adaptive

Software Development (ASD), Feature Driven Development

(FDD), and Dynamic Systems Development Method

(DSDM) Crystal, Lean Software Development etc. [10].

Agile methods break tasks into small increments with minimal

planning called Iterations. Iterations are short time frames that

runs from one to four weeks. Each iteration involves a team

working through a full software development cycle, including

planning, requirements analysis, design, coding, unit testing,

and acceptance testing. This minimizes overall risk and

allows the project to adapt to changes quickly. Most of the

agile implementations use a formal daily face-to-face

communication among team members. In this brief

communication, team members report to each other what they

did the previous day, what they intend to do today, and what

are the hurdles they faced When customer or domain expert

works directly with the development team everyone learns

something new about the problem [15, 16,17].

Agile methodology addresses exactly the challenges of an unpredictable, disordered business and technology environment [5]. Agile methodologies are used to achieve higher quality software in a shorter period of time, self-organizing teams, customer collaboration, less documentation and reduced time to market [6,7]. Agile methodology includes a family of lightweight methods that include Scrum, Crystal Clear, Extreme Programming (XP), Adaptive Software Development (ASD), Feature Driven Development (FDD), and Dynamic Systems Development Method (DSDM) Crystal, Lean Software Development etc. [8]. Agile methods break tasks into small increments with minimal planning called Sprints. Sprints are short time frames that runs from one to four weeks. Each sprint involves a team working through a full software development cycle, including planning, requirements analysis, design, coding, unit testing, and acceptance testing. This minimizes overall risk and allows the project to adapt to changes quickly. Most of the agile implementations use a formal daily face-to-face meeting among team members. In this brief meeting, team members report to each other what they did the previous day, what they intend to do today, and what are the hurdles they faced [13, 14,15].

As per Bustamante and Sawhney (2011), the best Agile project team is little in terms people in the group, communicate face to face daily through standup call which has a team size of people not greater than 9. Beside this, agile ways like scrum master optimum team size of seven plus or minus two. But some business specialists claim that Agile may be a one size fits all methodology which it may be scaled up to a hundred- and fifty-person team. Normally Agile Management is long-faced with one key challenge: What should the optimal team size be for which Agile is to be applied for the team to be effective? Since Agile is individual focused, we ought to perceive how team size affects individual behavior and productivity at intervals in agile team and this rises to a different challenge. What people factors should be considered when managing an agile team to make it effective?[9,10]

**II.SCALE AGILE FRAMEWORK**

Scale Agile Framework contains teams of 5-9 Individuals who define, build , test and deliver an increment of value in a short time box. The main reason behind having two small teams rather that having one large team is the communication between the team diminishes if the team size increases more than required.[19]

These teams contain two main roles namely the Product Owner and the Scrum Master. Working with multiple teams over in agile method is known as Agile Release Train. These are responsible for delivering large solution values. The teams that are in this train collaborate with each other contribute towards the project vision. They are also responsible for the Continuous Delivery Pipeline.[19]

Agile teams are the build blocks for creating and delivering value. Without the results will not be as expected. These teams should be self-organizing and self-managing teams that must be accountable to deliver the results that meets the expectations of customers and the stakeholders. They should also be accountable to one and another for deliver the product on time.[19]

Teams in the Scale Agile framework have the following responsibilities to be taken care by them.[19]

1. Collaborate with the Product Owner to create and refine user stories and acceptance criteria

2. Participate in PI Planning and create Iteration plans and Team PI Objectives

3. Develop and commit to Team PI Objectives and iteration goals

4. Estimate the size and complexity of their work

5. Use pairing and other practices for frequent review

6. Determine the technical design in their area of concern, within the architectural guidelines

7. Conduct research, design, prototype, and other exploration activities

8. Implement and integrate changes in small batches

9. Create and test the work products defined by their features

10. Test the work products defined by their features

11. Deploy the work products to staging and production

12. Support operational business solutions

13. Support and/or create the automation necessary to build the continuous delivery pipeline

14. Continuously improve the team’s process

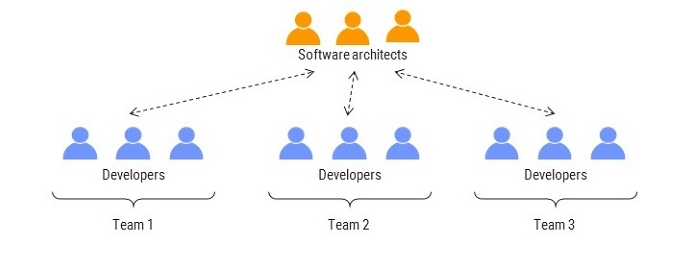
**III. DESIGN AND ARCHITECTURE**

Architecture is an important aspect of agile software development method, just like in normal models like Waterfall Model, and is a critical part of scaling agile approaches to meet the real-world needs of modern organizations. Architecture which is well designed helps the customer to understand the product in the better way. Changes can be implemented in case if customer feels that he may have missed something during the sprint cycle. Agile architecture must strike the balance between the team, software and environment.[17]

In large Agile Teams, Geographically Distributed Teams there will be Architecture Owner Team or Enterprise Architecture team that will take care of these activities’ Geographically Distributed teams architecture owner in each sub team will be in architecture team which helps a chance to increase the chance that each sub team understands and follow the architecture as well as increases the chance that the overall architecture strategy will address the full needs of the overall solution. One Chief Architecture owner will be there in the architecture team and it will be shifting from one person to another person within the team.[16]

There are two ways where we can implement agile software development where we have multiple teams collabrating with each other.Lets see the advantages and disadvatages for both of them and how these influence Design and architecture of the system.[18]

First approach is to have a few teams of developers and a separate team of software architects workly closely with one another.

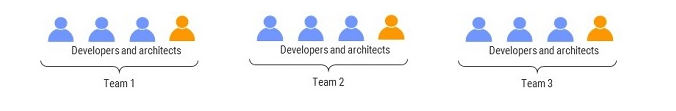


**Figure1:** **Separate Team of Architects Works with Multiple Development Teams.[20]**

We may face few problems while following the approach. The drawbacks to this approach are

1.In the above scenario the software architects will become the demanders who define the vision whereas developers are left to implement it. In case of noninvolvement of the developers in few of activities may cause a gap between them which may reflect on the final product[18]

2.Second approach would be placing a software architect in the same team as that of developers which helps in the proper communication between the software architect and developer of same team as well as software architect between different teams.[18]

Figure2 : Each Development Team has One Software Architect[20]

This approach has advantages and responsibilities changes for the software architect. This approach helps us in making quick informed decisions by making the prototype of the system whether the functionality can be implemented or not. This approach focuses on the Sustainability where the architecture will support the project for a long term. In this approach the software architect is part of development team. He can give first hand decisions about the software developed by the development team.[18]

ACKNOWLEDGMENTS

I would like to thank my professor Michael Findler for encouraging us to do research on agile team working with multiple agile teams

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Conference Short Name:WOODSTOCK’18

Conference Location:El Paso, Texas USA

ISBN:978-1-4503-0000-0/18/06

Year:2018

Date:June

Copyright Year:2018

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DOI:10.1145/1234567890

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Price:$15.00