

“AGILE-SCRUM:HOW PRACTICED IN SOFTWARE PRODUCT INDUSTRY AND ITS CHALLENGES”

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Abstract—Today AGILE methodology has grown very speedily due to its simplicity and effective team management solutions. One of its methods called “Scrum” today is the most studied method due to its simplicity, uniqueness and the assumption that Scrum is able to improve the productivity in the team and can increase the productivity of Software Product Companies. In this paper we will see How Scrum is implemented and practiced in product based companies.

Keywords—Agile, Benefits of Scrum, Drawback of Scrum, Scrum, Scrum in Product Companies, Scrum in Software Product Process

I. INTRODUCTION

Increase in profit, effective team management, easy adoption of change, focus on business values etc. are very hot topics for today’s Software Product companies, to achieve these goals software product companies adopt various methods or methodologies in its process. Agile Software development methodology has grown very vast today due to its simplicity and effective team management solutions efficiently in every domain of industries, delivering the highest quality of products within the constraints of limited budget. For this reason, companies are adopting Agile methodologies in their environment. A survey was performed in the US and Europe and has shown that 14% of software companies are already using agile methods (like scrum), and 49% of the companies which know something about agile methods are interested in adopting them [1] Scrum is now a day is the most studied Agile method due to its novelty and the assumption that Scrum is able to improve the productivity in the team. It is a disciplined approach for software development with the goal of making the process more effective, efficient and predictable [5][6].

II. AGILE – IN BRIEF

17 software developers, In February 2001, met at the Snowbird resort in Utah, western US, to discuss

lightweight development models which can easily be adapted to frequent changes in software life cycle.

A. Key Concerns of AGILE:

- 1) Team members on individual level are committed to achieving their team goals in each and every Sprint.
- 2) Customer will be more satisfied to see Working software than just presenting slides or documents to clients in meetings
- 3) Because requirements may not be fully collected on the beginning of the software development cycle, so continuous customer or stakeholder involvement is very important for realistic software.
- 4) Agile methods are concentrated on frequent changes and continuous development of software product.

B. Twelve principles of AGILE Manifesto:

The Agile Manifesto is based on twelve principles: [2]

- 1) Early Customer satisfaction through delivery of working and error free software with short time span e.g. weeks (1-4)
- 2) Accept requirements changes at later stage of delivery also.
- 3) Working software is delivered repeatedly i.e. weeks rather than months.
- 4) Close cooperation between business people (e.g. Top Management) and team on daily basis till the end of product development.
- 5) Motivated individuals, Give them the environment and support they need, and trust them to get the job done.
- 6) Face-to-face conversation with each other is important.
- 7) Working software is the primary measure of progress.
- 8) Able to maintain a constant speed of software development and delivery.
- 9) Continue focus on technical excellence, design and latest technologies around.
- 10) Simplicity is very important

- 11) Self-organizing teams to improve architectures, requirements, designs and provide valuable ideas.
- 12) Short, Timely and Systematic team meeting.

The Agile Manifesto doesn't provide concrete steps that how it will be implemented. It depends on Organizations which usually seek more specific methods within the Agile movement. These includes Crystal Clear, Extreme Programming, Feature Driven Development, Dynamic Systems Development Method (DSDM), Scrum, and others. [8]

III. SCRUM – a method of AGILE

Scrum is an iterative, time-boxed, incremental project management method based on a simple “inspect and adapt” framework [9]

Jeff Sutherland and Ken Schwaber imagined the Scrum process in the early years of 90's. They organized Scrum in 1995 in order to present it at the Oopsla conference in Austin, Texas, United States and published the paper “SCRUM Software Development Process”.

Ken and Jeff innate the name ‘Scrum’ from the 1986 groundbreaking paper ‘The New New Product Development Game’ by Takeuchi and Nonaka, who were management thinkers. With the term ‘Scrum’ Nonaka and Takeuchi referred to the game of rugby to focus the importance of teams and some correlations between a team sport like rugby and being successful in the game of new product development.

As per Jeff Sutherland, Scrum is not a process or a technique for product development, but an iterative and incremental framework [7]

A. SCRUM – Roles

In Scrum (of Software Product Company) there are 3 roles i.e. “Product Owner”, “Scrum Master” and “Development team”

- 1) *Product Owner*: this term includes the Product Stakeholders like Client, Company owner, Product Managers, Business Analysts, purely depends on the structure of the organization. They prepare the road map of the products and divide the proposed product into micro units and specially BAs will prepare the user stories for small functionality and feasibility of user stories.
- 2) *Scrum Master*: Scrum Master is responsible for eliminating obstacles in the path of the ability of the team to deliver the product and deliverables, Scrum Master is not like Team leader or Product Manager, he is responsible that team should follow the SCRUM strictly in the team

- 3) *Development Team*: Development team is responsible to implement the desired goal/Stories, this term includes the Software developers and testers.

B. SCRUM – Terminologies used

In SCRUM there are various special words/terminologies used which are as under:

- 1) *Scrum Team*
It includes Product Owner, Scrum Master and Development Team
- 2) *Product Owner*
The persons/stakeholders which are responsible for maintaining the Product Backlog like Clients, Product Managers, Business Analysts, Company Owners.
- 3) *Scrum Master*
The person responsible for imposing of Scrum rules and regulations and makes sure that it is implementing correctly, efficiently and maximizing its benefits.
- 4) *Development Team*
A group of people consisting of Developers and Testers who are responsible for delivering increments of product at the end of every Sprint successfully.
- 5) *Sprint burn-down chart*
Daily progress for a Sprint up to the Sprint's period.
- 6) *Release burn-down chart*
Graphically shown the progress of completed items of Product Backlog.
- 7) *Product Backlog (PBL) list*
A selected list of high-level requirements which are to be implemented.
- 8) *Sprint Backlog (SBL) list*
A selected list of tasks to be completed in the timespan of the Sprint.
- 9) *Sprint*
A fixed time period (up to 1 - 4 weeks) in which development occurs on a set of items that the team has committed to.
- 10) *Spike*
A time boxed period used to research a concept or create a simple prototype. Spikes are often introduced before the delivery of large or complex Product Backlog Items in order to produce a proof of concept. The duration and objectives of a spike is agreed between Product Owner and Development Team before the start of development work.
- 11) *Tracer bullet*
A tracer bullet is current set of best practices followed previously that results in production quality code.
- 12) *Tasks*

Work items added to the Sprint Backlog during the Sprint, with an estimate of time in hours to complete

- 13) *Definition of done (DoD)*
Definition of Done is a simple list of activities (writing code, coding comments, unit testing, integration testing, release notes, design documents, etc.) that add verifiable/demonstrable value to the product[3]
- 14) *Velocity*
The total effort in hours and user story points of a team during a Sprint
- 15) *Impediments:*
Anything that stops a team member from performing the task.
- 16) *Sashimi*
Scrum uses the sashimi technique to require that every slice of functionality created by the developers be complete. All of the requirements gathering and analysis, design work, coding, testing, and documentation that constitute a complete product are required to be completed in every Sprint and demonstrated in the Sprint increment of functionality [4].
- 17) *Abnormal terminations*
The Product Owner can cancel a Sprint. He/they may do the same with inputs from the team, Scrum Master or management. If a Sprint is abnormally terminated, the next step is to conduct a new Sprint Planning, where the reason for the termination is reviewed.
- 18) *ScrumBut:*
ScrumBut / "Scrum but" is a term to describe the approach of a team who have alter the Scrum framework to their own needs in some way inconsistent to the principles of Scrum.

IV. PROCESS OF SCRUM IN SOFTWARE PRODUCT COMPANY

Blow process shows that How the SCRUM is implemented in the Software Product companies.

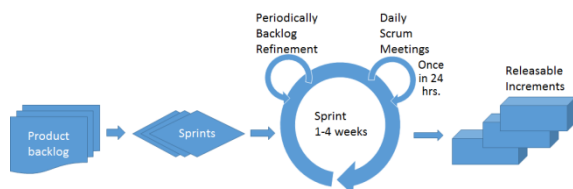


Fig. 1 AGILE Process

In SCRUM process, first we have the broader view of features which should be include in the product with a fixed timeframe. Company owner and/or Product Managers set the Roadmap of the product with study of the market trend.

Next we have Sprints: sprints are of period of 07-28 days, but depends on the company to company. This period includes the development activity and testing activity. If any task is incomplete in one sprint then it will go to the next Sprint, in some Companies we have 4 Quarters in the year and have 4-6Sprints in each Quarter. Before every Sprint starts there is a Kick off meetings in which BAs explores the user stories and its requirements and taken up and solve queries from team members.

In Each sprint we have Daily Standup Meetings, of half to one hours long, in which each member of Development team (i.e. Scrum master, Developers and Tester) participates and discuss the problem if they have any on the previous days or any suggestion by any team members.

In each sprint we have periodical (not fixed) meetings between Product owners and Scrum masters for the backlogs of the product related activities and assess that which tasks are achieved and which are not. If any task is not achieved, then they try to find out the reason of it. And do proper analysis and discuss that how it can be implement and in which time frame.

At the end of each sprint we have one incremental fully functional build. It depends on company that after how many Sprints it gives/releases the product to client/customers. Normally after each quarter i.e. 4-8 sprints company delivers the incremental build to its clients.

After end of some fixed period i.e. quarterly, all the team members have brain storming session in a meeting which is call "Retrospection meeting" in which they explore what went wrong and what went right for wrong happening they explore the root cause and find solution for it. And explore their strengths and weaknesses.

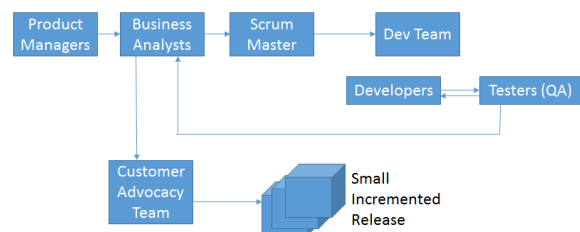


Fig. 2: Agile Practiced in Software Product Company

Company owners and/or Product Managers sets the Roadmap of product with study of the market trends. This team decides that which feature will be the part of the product and in what time frame.

This Roadmap goes to Business Analysts (BA) for further bifurcation of the requirements. BA bifurcate the big requirement into small chunks of requirements and prepares the User Stories. After prepare the user stories Product Managers reviews the User Stories and

if found any deficiency the same is corrected by BAs and added into Product Backlog store.

Now these stories goes to Scrum Master, who explore the stories on basis of technicality and feasibility and decide that how they can be implemented and decide the impediments. if any. He also decides the User Stories Points in meeting with team. These points are nothing but the numerical figures like 1,2,5, 10 etc. which shows the complexity of the story and in how many hours/days it would be completed.

After the analysis, these stories goes to respected team members for implementations. Developers develops and

Testers tests the requirements.

After testing, when tester/QA feels that this work is OK then this piece of work goes to BAs for final testing and if BA feels it is not upto the mark then s/he assigns it back to the Scrum master/ respected team member(s). If it is fine then after integration testing of increments it goes to CAT team i.e. Customer Advocacy Team or Client(s) (this is for example, the name of team depends on company to company). They finally inspect the requirement and say Yes or No to the build.

V.BENEFITS PROVIDED BY SCRUM

- A. Better Quality of the Software product.
- B. Highly Customer satisfaction with limited timeframe.
- C. We can have working software early. It would be benefits to the Market of software product.
- D. When software product is available early in themarket then the company can lead in the competition and the sale of the software product increased and ultimately company financial condition become better.
- E. Each team members have key role, so team moraleis high in SCRUM.
- F. Scrum teams collaborate with each other, take ownership of quality and project performance and they can produce great results.
- G. At the end of every sprint, product owner can compare the project's actual cost plus theopportunity cost of future projects against the value that the current project is returning
- H. Scrum teams have can control project performance easily and make corrections as needed
- I. Scrum helps alleviate the risk of absolute project Failure
- J. Due to short time of sprints and constant feedback, it becomes easier to cope with the

changes in requirements and technical changes.

VI.CHALLENGES OF SCRUM:

- A. If the team members are not dedicated or loyal then the project will never be complete.
- B. This practice needs experienced team members only.
- C. If thereis too strict control over the team members then itcan be extremely frustrating for them, leading todemoralization and the failure of the project.
- D. If any of the team members leaves the team during a development, it can have a huge inverse effect on the project development
- E. Daily meetings sometimes frustrates the team Members.
- F. Implementing the Scrum framework in large teams is challenging and sometime become headache.
- G. Leaving ratio is very high in some companies.

VII. HOW TO COME OVER FROM CHALLENGES

- A. Enroll only experienced team members.
- B. Enroll dedicated team members.
- C. There should not be extremely strict restrictions in the team.
- D. There should be time for relaxation from daily team meetings or be exempted when it is of no use.
- E. Team size should be limited to 8-10 persons.
- F. All the changes in standard Scrum practiced should be properly written and approved with cause, so that everyone knows that why there is a change.
- G. Leaving ration should be minimum.

VIII. CONCLUSIONS

We have seen in above study that How the SCRUM is practiced in Software Product Companies and what benefits are provided by adopting the SCRUM. We have also gone through various lacking of SCRUM method of AGILE methodology.

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