

# Software Development Using Agile Methodology Using Scrum Framework

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**Abstract-** Agile methodologies are enhancement in SDLC with the aim to provide more efficient software on time. In this, where the universally accepted AGILE Methodology called SCRUM came into existence, almost the 65% of the industry moved to SCRUM model, from the existing regular Software Life Cycle Model. SCRUM assumes that the systems development process is an unpredictable, complicated process that can only be roughly described as an overall progression. SCRUM defines the systems development process as a loose set of activities that combines known, workable tools and techniques with the best that a development team can devise to build systems. Since these activities are loose, controls to manage the process and inherent risk are used. SCRUM is an enhancement of the commonly used iterative/incremental object-oriented development cycle.

**Index Terms-** AGILE Methodologies, Product Backlog, SCRUM, SCRUM Framework, SPRINT.

## I. INTRODUCTION

The SCRUM based software development life cycle is the latest trend in the industry where there will be no hierarchy for the process and the development will be done iteratively by interacting with the people and the concept of conventional life cycle process is not followed. Majorly SCRUM deals with individual interaction the process and tools which we use for a normal life cycle process, customer collaboration, responding to the changes immediately..

## SCRUM INTRODUCTION

Software Development Life Cycle Processes can be achieved by different process models and methodologies which are existing in the market. The main aim of these AGILE Methodologies is to reduce risk by breaking projects into small, time-limited modules or time boxes ("iterations") with each iteration being approached like a small, self-contained mini-project, each lasting only a few weeks. The major difference which we can make between the traditional SDLC and the AGILE methodology is customer collaboration, immediate response to the change. We have different types of methodologies and Frameworks in AGILE like Dynamic systems development method (DSDM), Rapid Application Development (RAD) & SCRUM. Where SCRUM is a process that allows us to focus on delivering the highest business value in shortest time in this process the development team works as a unit to reach a common goal as opposed to a "traditional, sequential approach". There are 3 core roles in SCRUM like "Product owner" "Development Team" & "scrum

master". The ancillary role in the SCRUM team is taken care of by stakeholders and the managers. The SCRUM process is like first the PLAN is estimated and the product is INSPECTED after the completion of the Inspection the product is materialized and the SPRINT is adapted. The SPRINT is a piece of work which is executed in a given particular time (like 2 - week 3 week) the features which are to be implemented in the given application are divided into a number of tasks and each task is categorized into SPRINTS in turn these sprints are developed into a project according to the needs of the customer.

## II. SPRINT

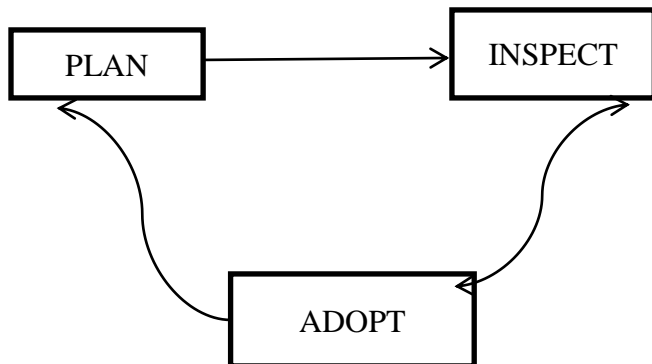
Sprint is a piece of work done within a stipulated time like Two – Four weeks. Each sprint is preceded by a planning meeting, where the tasks for the sprint are identified and an estimated commitment for the sprint goal is made, and followed by a review or retrospective where the progress is reviewed and lessons for the next sprint are identified. Sprint is done with the help of product backlog where we find all the requirements for the execution of SPRINT. Product owner informs the team member the items to be identified and developed accordingly he also gives the priority to the list of items to be developed. This sprint backlog is the property of the development team where no one can come and edit the backlog only the sprint team/development team can do the changes and these changes are to be done in a fixed time or in a time box. Once if the development is done the team demonstrates or trains the end user how to work on the product.

The best process SCRUM does is if self-organizes the teams by encouraging verbal communication between all the team members and good discipline in the project. KEY principle of the SCRUM is if any customer changes his mind during the development process and asks for any changes they are ready for accepting it but in conventional or traditional manner it is not acceptable. For this SCRUM adopts an empirical approach by responding & delivering to the product backlogs quickly

## III. SCRUM PROCESS

The SCRUM approach assumes that the analysis, design, and Development processes in the Sprint phase are unpredictable. A control mechanism is used to manage the unpredictability and control the risk. Flexibility, responsiveness, and reliability are the results. Sprints are categorized like SPRINT-1 SPRINT -2 AND SPRINT-3 ..... ETC

SPRINT-1: Potentially Shippable: FEATURE A  
SPRINT 2: FEATURE A + FEATURE B  
SPRINT 3: FEATURE A + FEATURE B + FEATURE C.



SCRUM TEAMS are cross functional where these mainly deals with product backlogs by regularly checking the updates and building up the product .SCRUM MASTER plays important role with 3-P's

1. Process owner
2. Problem solver
3. Protector

But Scrum Master is not considered as Project Manager but he acts as barrier between the team and product owner. Scrum Master's role is to protect the Development Team and keep it focused on the work done by the development team..

#### IV. SCRUM VALUES

The Five Scrum Values:

1. Focus – “Concentrate all your thoughts upon the work at hand. The sun’s rays do not burn until brought to a focus.” – Alexander Graham Bell

Team focus is the domain of the Scrum Master. The SM removes work impediments to the Team, shields them from external influence and is responsible for making the Team fully functional and effective. The nature of Scrum means that the PO aids the focus of the Team by making sure that all work is prioritized in a backlog. Finally the Team must be focused on finishing the sprint User Stories while adhering to the Definition of Done.

2. Courage – “Fortes fortunaadiuvat – fortune favours the brave” – Latin proverb

The SM needs the courage to protect and guide the Team. Standing up to the PO and Stakeholders at the right time, really takes guts. The PO must have the courage to entrust the Sprint Backlog to the Team, a giant leap of faith as it is the PO who answers to the Stakeholders at the end of the sprint. Finally the Team must have the courage to aggressively commit to as much work as they think they can do each sprint.

3. Openness – “It is impossible for a man to learn what he thinks he already knows.” – Epictetus

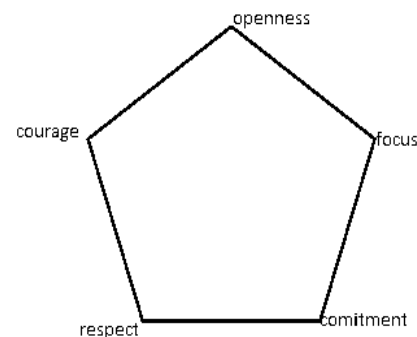
The PO must be open to accepting change, alternatives and new ideas, both from the Team and Stakeholders. By providing a qualified backlog with priorities and value, the PO is transparent about what is coming up next and the Team knows what to expect. The Team needs to be open to find the best solution to any problems from within. Scrum also pushes openness with the Retrospective Meeting, where any problems are pushed to light and dealt with in an open environment.

4. Commitment – “Do, or do not. There is no try.” – Master Yoda

The whole scrum process is a commitment to a new way of working, to be more adaptable. The Team commits to what they will do each sprint by choosing the Sprint Backlog and they also commit to how the work will be ‘done’ in the Definition of Done. This means the Team commits to doing whatever is necessary in order to meet their goals. The SM commits to actively guiding the Team and takes a weight of responsibility in making the Team adhere to the Scrum process. The PO commits to having a certain fraction of his Product Backlog ready for the Stakeholders every sprint, and also commits on the priorities of what the Team will do in each sprint.

5. Respect – “I speak to everyone in the same way, whether he is the garbage man or the president of the university.” – Albert Einstein

In Scrum, the limits and boundaries of the Scrum roles really need to be transparent, and respected. Everyone on a scrum project needs to be aware that the PO is in charge of what the Team works on, but not how they do their work, and that the Team is responsible for getting the work done, but not questioning what work gets done. The SM also needs to be aware that though he has more responsibility than a Team member, he is an equal member of the Team, and not a leader. In the ideal case, the SM is a gentle shepherd, or quiet guide to the Team.



#### V. TESTING

Testing itself has more important and immediate role in Scrum based Software development process? Testing isn't just providing results. Testing is important part of the Software

development process. In this it will provide feedback to the development, testing challenges supports and finally verifies developers work.

DoD (Definition of Done): The feature is done when code is ready, testing is done, no regression exists, and feature is ready to be released

Popular Testing methods in SCRUM Framework are

1. Regression testing
2. Exploratory testing
3. Automated testing
4. Integration testing
5. NFT (non-functional testing)

## VI. CONCLUSION

The Scrum Framework offers a high degree of flexibility promises a high probability of success. The major benefits are an anticipating culture increases, the sense of urgency promotes the sharing of knowledge encourages dense communications facilitates honesty among developers.

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