

Implementation of Scrum Framework of Agile Methodology for an Online Project

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Abstract — Agile software development^[8] has several software development methodologies which are based on iterative development. It provides a disciplined project management process and a leadership strategy which encourages teamwork, self-organization for providing high quality software and aligns the business approach between customer and company goals. Scrum is an iterative^[2] and incremental Agile software development framework. It is used to manage software projects^[12] and product or application development. It provides flexible strategy in which a development team works to achieve a common objective. It enables self organizing teams by encouraging team members^[2] and supports for verbal communication among all team members and disciplines in the project. It maximizes the team's ability^[9] to deliver quickly and respond to address unpredicted challenges. Scrum framework has roles, ceremonies and artifacts. Most software is working online for centralized access using the Internet. Most companies use web applications to communicate with its customers. Customers are registered and authorized from the company and can search for the information by using online web applications. The online projects are mostly uses n-tier architecture for its efficiency. I decided to implement the scrum framework in an online project and to address the work allotment and the issues raised in the self organizing team management who use Scrum framework. This paper will help us to understand the implementation of scrum framework of Agile methodology for the development of an online project for company in the following scenario and why use Scrum and When not to use Scrum. I have discussed the general view of Scrum and the implementation of Scrum for the Scenario below.

Keywords-- Agile Method, Agile Methodology, Implementation of Scrum, Scrum Framework, Scrum for Project.

I. SCENARIO

Global Tech L.L.C was an I.T. Solution Company. The company has many branches throughout the world. The transactions of all the branches are identified and communicated through the company web site.

The company managers, staff members, administrators and some users have access rights from this web site. This web site has the information of all their current clients and their handling projects. Some reports have published globally and some reports have to be taken by the specific manager or staff member of the company. This web site was more helpful for the company and for the customer. The website was maintained in a centralized server. Unfortunately, the server crashed in the last month and all the details of the website were deleted from the server. The general manager of the company decided to create a new website. He asked a project team from an IT department to build a new web site for the company. The web site must have a classic home page. It will include user management and various pages to be hyper linked such as mission, services, projects, clients and feedback...etc. The web site should be informative and organized by subjects, contain a navigation bar or similar, and consistent in formatting, layout, color, font, heading, writing style, etc. The manager called the team as "Scrum Team" and he asked them to follow scrum framework of Agile Methodology in their system development.

II. SCRUM TEAM

It is a development team that delivers potentially^[2] shippable increments of product at the end of each Sprint. This team may contain 3-9 individuals with cross-functional skills. The team member can do analysis, design, develop, test, communication and document.

The scrum team in the above scenario consists of 5 members. One of them is a product owner and the next one is a scrum master and the other people are team members. The following table shows the members of the scrum team.^[5]

Table 1

Product Owner	X
Scrum Master	Y
Team Members	A,B,C

Table 2

SL No.	Item description	(EST) hours	GROUP
1	Collecting Requirements for menu and home page and Master Page	24	ABC
2	Designing Style Sheet, Master Page and Home Page and write programs	24	ABC
3	Build and Test. Integrate web pages	24	ABC
4	Deliver Version1	24	ABC
5	Collecting requirements for all other pages and do changes in version1 if any	24	ABC
6	Designing, Programming all other pages and Integrating with the System	24	ABC
7	Deliver Version 2	24	ABC
8	Do changes requested by the customer and Deliver Version 3	24	ABC

The team members are doing analysis, design, implementation, testing and delivery.

Scrum Team: Product Owner

The Product Owner represents the stakeholders of the project and represents the requirements of the customer to the team. He plays an important role^[13] between the team and the business. He prioritizes the requirements of the customer into the product backlog. The customer can write the user stories. The scrum team must have one Product Owner. He is managing the Product Backlog^[1] and delivers the value of team work to the manager. He ensures that the team notices the product backlog and understands the requirement's priority. The product owner plans for product backlog in Sprint Planning Meeting and expects feedback from the team in the Sprint Review Meeting.

In the above table, X is a product owner responsible to create a new web site. He will create the following product backlog for the web site development after discussing with customer, manager, team members and scrum master.

Product Backlog for the Global Tech Website

It is a list of functions in a short description. And product owner is responsible to prepare the following product backlog for scrum team. The product backlog contains 9 sprints to complete the web site.

Scrum Team: Scrum Master

There is one scrum master for a scrum team who is responsible for ensuring^[3] to see the Scrum Team following the Scrum practices, values and rules. The role of Scrum Master is to guide the Scrum Team and the members must understand Scrum. The Scrum Master helps the Scrum Team to realize and use self-management to work dynamically.

For the above specified scenario, Y is a Scrum Master of the Scrum Team.^[11] He is responsible for creating the Sprint Backlog which specifies more details of tasks in each Sprint from the Product Backlog. The Sprint Backlog represents who will do which task in the Sprint on which day. One day working time is maximum 8 hours.

Sprint Backlog for Sprint #1

Table 3

Who	Task Description	12/11/2013	13/11/2013	14/11/2013
A	Collecting Requirements for Menu	4 Hrs		
B	Collecting Requirements for Menu	4 Hrs		
C	Collecting Requirements for Home Page		4 Hrs	
A	Collecting Requirements for Home Page		4 Hrs	
B	Collecting Requirements for Master Page			4 Hrs
C	Collecting Requirements for Master Page			4 Hrs

In the above table, Team Members A, B, C are working only 4 hours on each day. Some team member can take off from the work. So Team Members can share the work in them and feel free to work to be completed. They just report the dynamic schedule to scrum master in daily scrum meeting. The Scrum Master creates Sprint Backlog for all other Sprints. It is very important to avoid holidays in the Sprint Backlog. If there are any changes, it will be happened dynamically during the daily scrum meeting.

Sprint Backlog for Sprint #2

Table 4

Who	Task Description	17/11/2013	18/11/2013	19/11/2013
A	Creating Style Sheets	4 Hrs		
B	Creating Master Page	4 Hrs		
C	Creating Home Page		4 Hrs	
A	Testing Style Sheet and Home Page		4 Hrs	
B	Coding			4 Hrs
C	Coding			4 Hrs

Sprint Backlog for Sprint #3

Table 5

Who	Task Description	20/11/2013	21/11/2013	24/11/2013
A	Build the web site	4 Hrs		
B	Build the web site	4 Hrs		
C	Test the web site		4 Hrs	
A	Test the web site		4 Hrs	
B	Organize and Integrate the files			4 Hrs
C	Creating version			4 Hrs

Sprint Backlog for Sprint #4

Table 6

Who	Task Description	25/11/2013	26/11/2013	27/11/2013
A	Creating Set Up file	4 Hrs		
B	Creating Set Up file	4 Hrs		
C	Do settings in the Server		4 Hrs	
A	Do settings in the Server		4 Hrs	
B	Deploying in the Web Server			4 Hrs
C	Testing from the Client Browser			4 Hrs

Sprint Backlog for Sprint #5

Table 7

Who	Task Description	28/11/2013	01/12/2013	2/12/2013
A	Notice the changes requested by the customer	4 Hrs		
B	Do changes in version1	4 Hrs		
C	Build and Test after changes		4 Hrs	
A	Collecting Requirements for all other pages		4 Hrs	
B	Collecting Requirements for all other pages			4 Hrs
C	Collecting Requirements for all other pages			4 Hrs

Sprint Backlog for Sprint #6

Table 8

Who	Task Description	03/12/2013	04/12/2013	05/12/2013
A	Designing Screens and writing programs for all other pages	4 Hrs		
B	Designing Screens and writing programs for all other pages	4 Hrs		
C	Designing Screens and writing programs for user management		4 Hrs	
A	Build and Integrate with master page		4 Hrs	
B	Test all the pages			4 Hrs
C	Fix the issues			4 Hrs

Sprint Backlog for Sprint #7

Table 9

Who	Task Description	08/12/2013	09/12/2013	10/12/2013
A	Creating Set Up file	4 Hrs		
B	Creating Set Up file	4 Hrs		
C	Do settings in the Server		4 Hrs	
A	Do settings in the Server		4 Hrs	
B	Deploying Version 2 in the Web Server			4 Hrs
C	Testing from the Client Browser			4 Hrs

Sprint Backlog for Sprint #8

Table 10

Who	Task Description	11/12/2013	12/12/2013	15/12/2013
A	Notice the changes requested by the customer	4 Hrs		
B	Do changes in version2	4 Hrs		
C	Test Version3		4 Hrs	
A	Do settings in the Server		4 Hrs	
B	Deploying Version 3 in the Web Server			4 Hrs
C	Testing from the Client Browser			4 Hrs

Scrum Team: Team Members (A, B, C)

The team members are responsible for doing analysis, design, coding, testing and also in delivery. The team can work as a cross-functional team. If there are any dynamic changes, they have to inform this to scrum master in daily scrum meeting.

Sprint

It is a basic unit of development in Scrum. Each sprint has a specific duration. The duration is normally between one week and one month. No outside^[4] influence can interfere with the Scrum team during the Sprint. Each Sprint begins with the Daily Scrum Meeting. In the above Sprint Backlog, each Sprint takes 3 days to be completed.

Issues in the Team Management

In the scrum team, the Scrum Master^[10] reports to the product owner and the product owner reports to the management and the team members report to Scrum master. The members A, B, C can dynamically change their schedule with the permission of Scrum Master in their daily activities. They have to inform this to the Scrum Master. If they cannot able to finish the work in schedule, they can rearrange the sprints in the sprint backlog by discussing with the Scrum Master. If the team members have any queries, it will be solved by the Product Owner with the help of Scrum Master.

Scrum Ceremonies: Sprint Planning Meeting

The Sprint Planning Meeting^[7] has two parts. In the first part, Product Owner, Scrum Master, Scrum Team is the participants and the product owner determines the Sprint Goal and he creates the Product Backlog. In the 2nd part, Scrum Master and Scrum Team^[5] are the participants and the Sprint Backlog is created by the Scrum Master.

X is a Product Owner and Y is a Scrum Master and A, B, C are team members to the system development of the above scenario. X creates the Product Backlog in 1st part of the meeting and Y creates the Sprint Backlog in the 2nd part of the meeting. A, B, C are team members involved in this meeting.

Scrum Ceremonies: Daily Scrum Meeting

This meeting is for 15 minutes daily and it is to perform everyday at usually the same time and it is not for problem solving and this meeting is very important to update the status to team members and to the Scrum Master. The Scrum master asks the following three questions the team members in this meeting.

What did you do yesterday? ^[4]

What will you do today?

What obstacles are in your way?

The role of the Scrum Master is ^[3] to ensure that the Team meets as per the meeting schedule. ^[6] The Scrum Team is accountable for conducting and managing the Daily Scrum. The Scrum Master guides and explains the Team Members to ensure that the daily scrum is quick and effective by implementing the policies and rules ensuring that the members discuss about their work in short. The role of the Scrum Master is also to enforce the policy that only the people related to the activities discuss and not others. The daily scrum is a kind of assessment of what progress has been made towards the particular Sprint Goal. The intent is to optimize and ensure the probability that the team will meet its goal.

In the scenario above, The Scrum team members and the Scrum Master involve in the daily scrum meeting. The meeting is for 15 minutes and the Scrum Master ensures the activities of the day and the dynamic changes which are to be occurred during the day. If the team members need any clarifications, the Scrum Master informs these to the Product Owner.

Sprint Review Meeting

The Sprint Review meeting ^[1] is held at the end of each Sprint. The duration is for four hours for the sprints which completed in a month. It will not consume more than 5% of the total sprints. The Scrum Team members and Stake holders discuss about their work just completed. They will do changes to the Product Backlog for the next things which could be done.

In this meeting, the Product Owner is responsible to identify what has been done and what has not been done. They discuss about the problems involved during the Sprints. According to this, the Product Owner will do changes in the Product Backlog. This meeting gives valuable input to the next Sprint Planning meeting.

Spring Burn down Chart

It is a graphical representation of the status of each Sprint. It is created at the end of each Sprint and is used in the meeting for the discussion about the particular Sprint. It compares the time and the number of days of each Sprint. In the above scenario, the following Sprint Burn down Chart specifies the completion of work in the specified three days or not.

Sprint Burn down Chart for Sprint #8

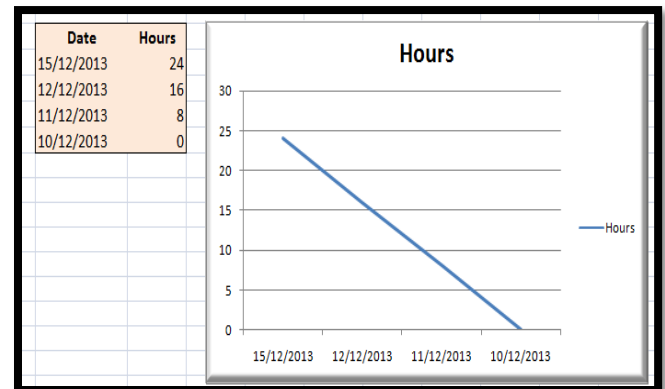


Figure [I]

Why choose Scrum for Software Projects

Scrum Projects assume that responsiveness to customer requests leads success and delivers high-priority requirements quickly and adjusts the schedule for Scope. It supports changes from month to month according to its requirements in priority. The project estimates are not reliable. It overlaps the works of the current Sprint with next Sprint. It uses all the resources and no need of lots of specialized resources. It gives results incrementally.

When not to use Scrum

- If any of the team members do not like Scrum.
- If the size of the big project is reduced into small.
- If the team is not stable and there is no coherence in the team.
- If each team member is not providing work dedication at least 50%.
- If the team is not a cross functional team.

Issues occurred in Implementation of Scrum

If any new requirements has found during the sprint, the number of sprints will be increased. It increases the work pressure of the developers which returns errors in coding. If there are more scrum teams, it leads to many communication problems due to the lack of rules for multiple teams in the scrum framework. If the customer is not available for an important discussion which leads to delay to complete the sprint. If all the team members have enough experience in programming, it does not affect the project objective. The in-experienced members must communicate with experienced members in the allotted schedule which affects the project outputs.

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All the developers must aware of the scrum tools. The human resource department must take care of the training for the in-experience developers. The preparation of document for a new requirement is also another problem for the developers. The team members have the laziness to update the burn down chart.

III. CONCLUSION

The scrum offers high degree of flexibility for the project success. The communication is more important in the team members for the web site development. The team builds the project many times to integrate the tasks of the sprints. The scrum promotes the sharing of tasks and increases the communication among team members towards a common objective. It provides good quality in the project. It is applicable in rapidly changing requirements and supports to complete the project in schedule and adapts changes easily. There are more benefits to customer and project manager. It freezes the schedule if any one of the project member has problem in the project team and adjusts the scope according to the project release. It manages the time effectively with team members and the customer. It is easy for the scrum master to estimate the work of the project team and to compare with the allotted schedule. It provides a high probability of success. This paper insists the co-ordination between team members must be effective and the human resource department must provide enough training for the developers to reduce the issues occurred in the team management.

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