

# To Monitor and Improve Project Development of Final Year Students using Scrum Model

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*Abstract: In today's challenging world of computer science, technology updations are frequent, because of which it becomes difficult for the students and the faculty related with computer science courses to keep pace with the updations. Similarly time management is also an issue that may affect effective teaching. For most of the degree courses in computer science students have to submit projects. There is a time constraint for project completion as the project is to be submitted within a semester i.e. almost three months. This research paper describes an attempt to integrate agile method and implement scrum model in computer science courses to help students complete the project on time. Scrum model focuses on self-organizing teams that will provide platform to the students to practice project organization. In this paper we have discussed a report for implementing scrum model to monitor project progress of final year students. The basic objective of the paper is to reduce incomplete Project submission at the end of the degree course and also the practical implementation of the scrum model helps the students to correlate subject knowledge.*

**Keywords:** Agile, Scrum, Sprint, Artifact, Builds

## I. INTRODUCTION

Quality in education is the basic objective of higher education as higher education emphasizes on specialization in various subjects. It is important that the students should be trained in the practical implementation of the subjects offered. In almost all the computer science courses the students have to submit major project in the last semester and minor projects in previous years. The project that the students implement in the last semester is also helpful for their placement hence it is important Project. Scrum Model in Agile technique provides a platform for Quick and practical technique for project development and also provides techniques that will help in continuous monitoring of Project. In this paper we have made an attempt to improve evaluation and monitoring of Projects of final year students by applying scrum model. This technique will also help teachers to bridge the gap between teachers and industry; thus making teaching more effective and Qualitative.

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## II. WHAT IS AGILE METHODOLOGY?

Agile is a development methodology based on iterative technique. Agile breaks the product into smaller builds. In this methodology, development and testing activities are concurrent, unlike other software development methodologies. It also encourages teamwork and face-to-face communication. Business, stakeholders, and developers and clients must work together to develop a product.

## III. WHAT IS SCRUM?

In Scrum model of Agile development the project work is not categorized rather it is believed that the team as a whole better knows how to solve the problem (i.e. Project development). Hence when scrum model is used there is no overall team leader. Scrum model relies on Self-organizing and cross functional teams.

Scrum is one of the implementations of agile methodology. In which **incremental builds** are delivered to the customer in every two to three weeks' time.

Scrum teams are supported by two major roles. The first is a Scrum Master, who can be thought of as a guide for the team.

## IV. SCRUM ARTIFACT

The primary artifact in Scrum development is, of course, the product itself; which is to be delivered at the end of the final sprint.

The second artifact is the product backlog. Product backlog defines a set of functionalities that have not been added into the project. The product owner enlists the features that are not added and also prioritizes these features so that the team could work on the important features first. Along with the list of prioritized functional and non functional features estimated time for the completion of these tasks is given.

The most efficient way to prioritize product backlog is to relate the functional aspects of the project with user stories.

## V. SPRINT

In Scrum project management during the project development team members create sprint backlog which is a to-do list for a particular sprint that should be completed by the team members. The team needs to perform the task in order to deliver the functionality in committed time.

Sprint burn down chart and release burn down chart are the additional features of Scrum methodology. Burn down charts help to keep the project on track as it is an effective



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tool to determine if the project is on schedule.

## VI. ROLES ASSIGNED IN SCRUM PROJECT MANAGEMENT

**Scrum Master:** Scrum master helps the team members to deliver the best performance with efficiency. Role of Scrum master differs from traditional Project manager in a way that Scrum master does not provide any resource or task allocation. The main objective of Scrum master is to prevent the team from external distractions and allow them to focus on the Project.

**Product Owner:** The product owner helps the team to visualize the product and is responsible for enlisting and prioritizing the product backlog.

**Scrum Team:** Scrum team is the third and final role in Scrum project management. In Scrum Project management the team members work irrespective to the job titles. Scrum Methodology states that each team member can participate in project development in whichever way possible in order to complete the work of each Sprint. Thus individual team members work beyond their preferred disciplines.

## VII. PROPOSED METHODOLOGY

In this method we have described how Scrum model was implemented during Project development and completion of final year students of computer Science. In this course students learn different programming languages like Java, PHP, Dot net. The students are supposed to implement these languages in practical and projects. The projects are to be completed in groups but most of the projects remain incomplete due to basic errors and improper project management as the timely rectification of errors is not possible. The main reason behind this cause is that there is gap between the theoretical knowledge acquired by students and its practical implementation. Another concern is the students are in the learning phase so understanding the theoretical aspect of a programming subject and immediately implementing it in project requires self-organization techniques which student generally lack. Students study Agile methodologies, operating system , DBMS ,SPM in the core academics but they are not able to find and apply relevance between knowledge acquired in different subjects. To overcome this problem implementation of scrum model was introduced for better project management.

### A. Scrum Roles

There are four major roles in the method the product owner i.e. Teacher /Guide allocated to each Project group, Scrum master/Group leader who is a student among the project team and has functional efficiency and skills with respect to the project topic. Each team member or student play the role of scrum master in rotation. Lastly the student also plays the role of team members.

In the method four projects were monitored using scrum model. Each project group consists of four team members .Amongst the four team members the student having better technical knowledge is made the group leader who is also responsible for sprint burndown chart. The group leader is suppose to enlist the to –do list for the specific sprint. The

group leader should represent the team in the retrospective meeting and should report the progress of the sprint to the scrum master.

### B. Scrum Event

Sprint is a fixed time cycle in which each of the task like module development, UML design, input/output screen design. Sprints are iterative. In Sprint planning meeting what and how part of the task are decided. Retrospective meeting focuses on the betterment of the upcoming Sprints. At the end of the sprints, students' give presentations to their respective scrum master according to the presentation schedule. The scrum master/teacher evaluates the progress of the project at the end of every sprint and also evaluates final presentation of the whole integrated project at the end of the semester.

### C. Sprint based Course Schedule:

Sprint No.	Task
1	Topic Selection, Synopsis submission, Hardware and software requirement and scope of the project
2	Working on ERD
3	UML designs
4	Rectification and Finalizing ERD, UML
5	Input and output design
6	Finalizing input and output designs.
7	Discussion on user interface standards.
8	Evaluation of front end design and functionality
9	Database connectivity
10	Final presentation of complete project.
11	evaluation of shortcomings in complete project
12	Documentation.

### D. Result Analysis

In this report teacher is playing the role of product owner. The project team has to report at the end of each sprint and also has to present the final project report to the product owner/teacher. It is the responsibility of product owner to enlist the product backlog.

## VIII. CONCLUSION

The basic objective of this research was to test if it is possible to implement scrum model as a teaching methodology in monitoring final year projects. A report was conducted at Dr. D. Y. Patil ACS college, Pune, where teachers used Scrum as a teaching methodology for monitoring project progress. It was a great practical experience for students as we have to implement their project work in sprints. The student had to make technical updates as and when suggested by product owner. Students were groomed in presentation skills. Implementation of this case helped to improve the logical technique of students in project development. Scrum model

technique helps to minimize the practical difficulties faced by the students while developing the project. Scrum model is an Iterative and Incremental technique that help to control risk factor in the project. Thus predictability, risk identification and mitigation was easier to track in the project.

Requirements were specified at the beginning of the project hence the outcome of the project was visible to the team members as well as product owner. Thus transparency factor of scrum model is reflected in report. Inspection is another factor that scrum theory provides. It was achieved in the report as the project progress was continuously monitored by the scrum master and product owner according to the schedule provided in the table above. Continuous monitoring helped to adjust the project and kept the project on track. Thus prevented the project from deviations which reflects the adaptation feature of scrum theory.

- Minimization of errors was also achieved due to scrum model implementation.
- It will help to bridge the gap between industry and academics.
- The objective of in time submission of project was achieved as almost all the project groups were able to submit project on time.
- So we can conclude that scrum model implementation in academics and especially in monitoring project progress definitely will bring change in quality of education imparted by the teachers.

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