

# Grooming a New Team with Potential Roles using the Scrum Practices

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**Abstract--**The Scrum, an agile development process allows quickly production of working piece of product by undergoing the development into small release cycles and in improvement ways. There is a growing demand to expose students to such practices. In the same time, students also need to practice the possible roles that they will get when they join a real life project or an industry. Exercising the Scrum practices may help the students to learn and practice the possible roles to perform during a project. During a cycle, of scrum called 'sprint retrospective', the team dedicated time to reflect how they are doing and to find ways to improve. The scrum team will be constantly looking for improving opportunities either for the product builds or the practices they choose. In this paper, we discuss our experiences in practicing the Scrum practices in students' development of final year projects. This study may be useful for students in the final year.

**Index terms:** Scrum, training, roles, project team

## 1. INTRODUCTION

In this business world everyday a new team is formed. The team or organizational successes do not depend on individuals, but to the combined effort of the team. The accepted practices involved in Software Engineering are changing. The traditional software development practices will not always endow students with the understanding of the roles and responsibilities for their future workplace [1,2]. Many times the practices of doing the things are changing and looking for other better options. Proper utilization of the available knowledge and assigning proper responsibility is essential.

How do we get the best performance out of a team? How to learn and practice the possible varieties of roles in a real industry? What are different roles that one needs to learn before joining a project? These questions may be extremely interested to prospective employee, other name-the current students. Most of the recruiter also looks for the potential candidate who has some prior knowledge on roles and responsibilities. Such candidate will know their possible roles in a project. This will be a win-win situation for both the party, who is going to give training also for those who

are going to get job training.

Looking to the trends in changing industrial practices and switching of responsibilities we would recommend the students to familiarize with different roles and its supporting practices. The team must take responsibility for success of the project and motivation among the team. Scrum can be an alternative practice and more practical approach to teach the software engineers to take varieties of roles during a lifecycle of a single project. Many of the projects are failing due to human factor, not by technical factors. Learning the possible roles to perform in an industry during university days will be considerable value to an individual while joining the industry. Such roles can be practice during the final year project or on the job training.

The rest of this paper is organized as follows: in Section 2, we briefly introduce the main practices of Scrum process. In Section 3, we also outline the background of our study and define aspects of the study. In Section 4, we evaluate the practices of Scrum practices with regards to the previously defined study aspects. We conclude this paper in Section 5 with a summary of the main observations.

## 2. THE SCRUM

Scrum is one of most popular agile process used for software development [3,4]. It is a general-purpose project management framework that follows an empirical process. It does not specify software development activities in advance but focus on learning from experience. Knowledge is used for guidance going forward. It focuses on maximizing the business value, constant improvement and is a priority driven. This can be use for improving the current practice in a team also.

In Scrum, projects are developed via a series of iterations called sprints. Each sprint is typically 2-4 weeks long. A typical scrum team has five to nine people. The team does not include well-defined traditional software engineering roles such as programmer, designer, tester etc. In this practice, everyone in the team works together to complete set of work that collectively committed to completing within a sprint.

### 2.1 Broad roles in Scrum

#### 2.1.1 Product owner

In the normal Scrum, the product owner represents users, customers and others in the process. The product owner is

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usually someone from the department of product management or marketing that manages the vision. He decides the time to deliver the product into a production environment by considering the level of the risks as well as consequences of actions. He also develops and maintained the **product backlog**. Product backlog is prioritized list containing every desired feature to the product. Product backlog is own by the Product owner. In our study, product backlog is prepared by the team (the students) before the start of the project and verified from the project supervisor also accept by the team, unlike the normal scrum.

### 2.1.2 Scrum Master

Scrum master owns the process, motivates and coaches the team. Scrum master ensures that the team does not go off target. The Scrum master is responsible for making sure the team is as productive as possible. The Scrum master does this by helping the team to manage the Scrum process, by removing impediments to progress, by protecting the team from outside.

### 2.1.3 Scrum team member

Plan the tasks, manages their commitments and worked together as a team to achieve the defined vision. Members are responsible for delivery of functionality.

### 2.2 Sprint Planning

The following activities are undertaken in a sprint planning session

- Sprint planning meeting time/date set by Scrum master
- Product backlog is presented, with any information helpful to the team from the business by Product owner
- Select product backlog items for the sprint by the entire team
- Define the goal or vision for the sprint
- Construct sprint backlog by Scrum team and Scrum Master
- Presentation to stakeholders by the Scrum master [5,6]

### 2.3 Daily Scrum

It is a stand-up meeting. No detailed discussion in this forum but it aims to increase transparency without debates. It must be held at the 'same time, same location' every day. Some quick decisions may be taken, left to the discretion of the scrum master.

### 2.4 Sprint Session

At the start of each sprint, a sprint planning meeting is held during which the product owner presents the top items on the product backlog to the team. Product owner, Scrum master and team members meet to prioritize the functional requirements and organize the work. The team identifies the set of functionality that they can deliver. The choice is made by assessing business value of the functionality which is known as **sprint backlog**. That work is then moved from the product backlog to a sprint backlog which is the list of tasks needed to complete the product backlog items.

### 2.5 Sprint review meeting

After Sprint execution, the team holds a review meeting in the presence of the project supervisor. After the demonstration of the works, the supervisor takes its

judgment to declare which items consider as done. The supervisor also recorded the sprint number, the leading member name for that, other members, their role types and their performances during that sprint. In such way, the supervisor can provide feedback to the team[11]. The team identifies what they can learn from it. It is similar to iteration retrospective but includes a short presentation of the work done.

### 2.6 Benefits of Scrum

A transparent development process is achievable and the productivity increases. There is a continuous improvement. In no predictable software, development learning and guiding in the team is possible with a better team communication. During 'Sprint Retrospective phase', the team dedicated time to reflect how they are doing. And then they find ways for improvement.

## 3. TRAINING DESIGN

Scrum has been used to academic game development courses [7,8], other educations perspectives [9,10,12] and for large projects [5,6]. However, we are interested to provide a chance to all team members of a project to explore all possible roles using the Scrum practices. Do to so we propose a framework for this study.

### 3.1 Aspects of the study

We expect Scrum to have a positive impact on the following aspects. The project supervisor will record the student's performance based on these points.

**Teamwork:** It is necessary in any software development. We believe that source of the majority failures of the projects is due to human factor. Teamwork affects conflict management, communications, reliance, productivity etc.

**Proper communication:** Majority of the projects are executed by a team or group, not by a single person. Communication gap and misinterpretation is one source of team conflict. Each conflict will have an impact on any project.

**Dynamic roles:** The whole scrum member will be given a chance to learn the possible roles in a project. The roles of the member will be exchange among the team. For example for the Sprint 1, the member X wrote a program and member Y did testing for the program of member X. In Sprint 2, the role will be exchange between member X and member Y.

**Empowerment:** It may help individuals to feel more confident regarding their capabilities. Everyone's competences have an impact on decisions which results in higher motivation and commitment during a project and proceed to the next project.

**Productivity:** Projects need to be executed in a limited time. The scrum team will record their utilized time for each activity they performed. This will be then used to compare with the time taken by other team member on the same or similar activity.

### 3.2 Structure of the study

In this section, we propose a framework of our study. This covers the phases such as design, training, retrospective and its corresponding activities, deliverable or reports. The

primary goal of the study is to allow the student practices on possible roles they may experience when they join a real project. We are interested to practice the scrum practices. A proposed framework is given in table 1.

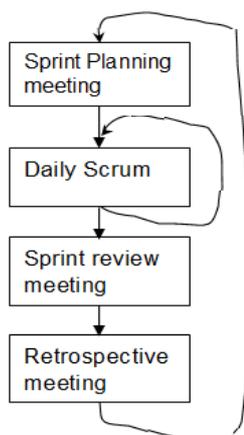


Figure 1. The Scrum team.

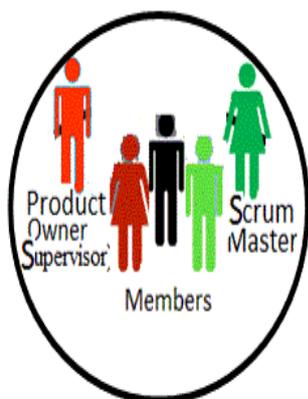


Figure 2. The Scrum flow

Table1. The study framework

Phase	Activity	Deliverable or outputs
Design	Team forming, Planning, Prioritization	project design document, product backlog, possible roles
Training Sprints	Assigning roles, Execution of Sprint, Swapping roles	recording time required for each activity, performance recoding
Retrospective	Postmortem of Performances, Discussions	final product, grades of students, performance reports, feedback, team performance report, project progress reports

### 3.3 Design Phase

The goal of the design phase is to group the students into Scrum teams to draft a project design document. A team comprises of four to five candidates. Before the first meeting, the students' backgrounds such as technical skills, requested roles etc are collected. These details are used to balance the teams [9]. In the first meetings, several iterations of brainstorm sessions are conducted to have a clear picture on current project and it is followed by group discussions. All members together finalized the project design document. The knowledge levels of participants are clearly identified. This help to identify one or more likely roles for each participant.

Before entering the first Sprint, the teams create a Product Backlog based on the project design. In consultation with the Product Owner (the supervisor), the team members define and prioritize the essential features.

### 3.4 Some changes to normal Scrum

As our study objective is to complete the final year project also to prepare the all the scrum members on the possible roles, we propose to change daily Scrum meetings with meeting at least twice a week. Normally the students have two lecture period (say 4hours) for the developing their final year project during a semester. The maximum duration for a final year project is a semester time (say 4 months).

We propose a student taking the role of the Scrum Master

despite being part of the Scrum Team. The project supervisor acts as a Product Owner, with one exception regarding the creation of the Product Backlogs, verifies the items (similar to marking of the project plan). Such the project requirements and the Product Backlog can only be planned by the Scrum Team member.

In addition to the Scrum meetings, all Scrum Masters meet with the supervisor twice a week. The problems, conflict or technical issues are discussed. During the each meeting, the Scrum Masters reports the progress of the project and performance of the team members to Product Owner (project supervisor). Table 2 is showing the summary of the proposed changes.

Table2. The changes to normal Scrum

Items	Normal Scrum	Training Scrum
Team size	5-7	3-4 (project team)
Sprint duration	30days	2 to 3 weeks
Weekly load	40hrs	6-8hrs (depends on unit enrol in a semester)
Create by	Product backlog	Product Owner
	Sprint backlog	Team
Scrum master	Scrum Master	By the team with support of Supervisor
Scrum	Daily	Team (no change) with support of Supervisor
		Also act as a team member
		Twice/thrice a week (depends on load)

### 3.5 Training Sprints phase

This is the main phase of our study. This includes the assigning of roles to team members, execution and swapping of the roles among the scrum team. The project supervisor will list down all the roles possible for the current project. While a member is acting for Scrum master for a sprint1, other member will observe how he assigned and coordinate with the product owner (supervisor). For the next sprint 2, next member will act as Scrum master. So on the whole all members will have a chance to act as a scrum master.

Next is the swapping of the project roles such as design, coding, testing. Such roles and responsibilities are also interchanged among the team. During the sprint review meeting, the project supervisor takes its judgment to declare which items are considered as done. The supervisor recorded the sprint number, the leader name and other members, their role types and their performances. A marking scheme will be used by the supervisor providing feedback. The unsatisfactory performances and related Sprint number will be recorded to discuss during a Retrospective Phase. Such a Sprint will be rerun again.

### 3.6 Retrospective Phase

The Sprint Retrospective is possibly the most valuable to share the lesson learned and to find for other improvement ways. This is accomplished in the retrospective by asking key questions about the practices that benefited the team or worked against it during the last Sprint. It also identifies new practices that should be started during the next Sprint. It is run by the Scrum Master and is time-boxed in real Scrum; we make some relaxation for our study. The amount of time spent in the meeting is determined by the team. The meeting is for the benefit of the team and anyone can attend. This is done by answering the following questions in the meeting.

### What worked well last Sprint?

The practices that worked well during the last Sprint should be identified and continued in the coming Sprint also share with other project team.

### What didn't work well last Sprint?

The team should identify practices that worked against the team during the last Sprint and looks for better alternatives.

### What should we start doing?

The team identifies practices that should be following for the coming Sprint that will help them work better together.

The Scrum Master will list all the answers given for each question. These are done after a lot of debate and discussion that occurs during the Retrospective. Following the Retrospective phase, the Scrum Master will conclude the answers given during the meeting and share within the team.

## 4. EXPERIENCE REPORTS

The projects of some final year students are executed using this new changes scrum practices. The project supervisor records the performance of the team each after a sprint in sprint review meeting. Some marks are allotted based on these performances. For some weak team members, suggestions are provided for improvement also appeal to rerun of some sprints till the performance comes out to a satisfactory level. The marks are used for showing their performance measure. After getting a satisfaction on the project progress and team performance, a final interview session will be conduct.

After the final presentation of all final year projects, interviews are taken for all the projects teams. Some team developed their projects using non scrum practices. Non scrum team' has restricted roles, where they have minimal opportunity to explore other roles. When there was concern about the familiarity and confidence of acting into different roles, the team who chooses scrum has more confidence on all our study aspects stated above. We are in interest of running such final year projects adapting scrum practices continuously in future semesters. Once students are recruited, Interview and data collection will be doing from such. We are sure there will be extremely positive feedback being the roles are practice before joining a real projects.

## 5. CONCLUSION

Scrum provides a structure and practices of roles, meeting, rule and deliverable to execute a project. Teams are responsible for creating and adapting their processes and practices within the framework. The roles will be changed for each of the sprint. In such way, the whole team was forced to practices all possible roles of a full life cycle of a project under the supervision of their own team members and the project supervisor. A experienced scrum master can help the item and other weak member can share information among themselves. This could help to practice and create a confident in accepting any role of a project. The members are committed clear, short term goals; learn to work in a team. They observe each other contribution and study for effective communication skills. Productivity and Transparency goes hand-in-hand with eliminating unnecessary work, showing steps, inputs, and outputs of the development process.

During the Retrospective phase, the team reflects on its own process. The supervisor observed the whole team on roles, progress and provide feedback. Some weak members were asking to rerun of the sprints with alternate improvement ways. As this performance carries some marks, the team took it seriously. This helps them to make the team to a full transparency in the project progress and roles. Our study aspects such as **Teamwork, Proper communication, Dynamic roles, Empowerment and Productivity** during a project are satisfied.

## REFERENCE

- [1] C. Coupal and K. Boechler. Introducing Agile into a Software Development Capstone Project. In Proceedings Agile 2005, Denver, Colorado, July 2005.
- [2] M. M. Muller and W. F. Tichy. Case study: Extreme programming in a university environment, In Proc ICSE 2001, Canada, May 2001.
- [3] A. Cockburn. Agile Software Development. Addison- Wesley, 2001.
- [4] R. C. Martin. Agile Software Development: Principles, Pattern & Practices. Prentice Hall, 2002
- [5] K. Schwaber and M. Beedle, Agile Software Development with SCRUM, Prentice Hall, 2001.
- [6] K. Schwaber, Agile Project Management with Scrum, Microsoft Press, 2004.
- [7] U. Wolz and S. M. Pulimood. An Integrated Approach to Project Management through Classic CS III and Video Game Development. In Proc. of the SIGCSE '07, pages 322{326. ACM Press, 2007.
- [8] J. Schild, R. Walter and M. Masuch, ABC-Sprints: Adapting Scrum to Academic Game Development Courses". Foundations of Digital Games 2010, ACM, 2010
- [9] D. F Rico and H.H Sayani, Use of Agile Methods in Software Engineering Education. In Proc. AGILE Conference, pp. 174-179, 2009 Agile Conference, 2009.
- [10] A. Gunasekaran, A. Agile manufacturing: a framework for research and development, International Journal of Production Economics, pp87-105, 1999
- [11] M. James, "Six Pages About Scrum," CollabNet, 2010.
- [12] D. Sanders. Using Scrum to Manage Student Projects. Journal of Computing Sciences in Colleges, 23:79, 2007.