Scrum

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Scrum

Developing projects that will produce outstanding results, require the use of proper tools and techniques to be successful. Nearly all developers know how difficult it can be to create a new product and understanding the proper usage of the scrum methodology can help simplify what might otherwise be a complicated task. In this paper, our group, “The Front Row,” will be discussing the topic of Scrum methodology. We will start by providing a baseline definition of the methodology followed by its history and contemporary uses. Finally, we will wrap up with the results of two different interviews with professionals who share distinctive viewpoints regarding the Scrum methodology.

# Scrum Definition

Scrum methodology can be defined as a method structure that can help to conduct the progress of a project. The construction starts by allowing members to illustrate what they know, which helps to recall the ideas of each member individually. In a scrum process, team members have a set goal on how to approach a problem by evaluating the functionality of the solution, investigating to see if it works and continue to examine suitable modifications (**1**). Scrum does not stand for anything; it is a term taken from the article "The New New Product Development Game," which was written by professors Hirotaka Takeuchi and Ikujiro Nonaka. The idea was taken from the rugby game, which consists of giving each player change to touch while reaching the same goal.

There are many different approaches to implementing the Scrum framework, and the approach that we will be covering in this section is the 3-5-3 approach. 3-5-3 provides the basic structure of Scrum and “Without the 3-5-3 you are not doing Scrum.” **(2)**. The Scrum framework is divided into three rules, the rules are as follows: 3 Roles, 5 Events, and at least 3 Artifacts **(2)**. The three Roles are the **Product Owner**, **Scrum Master**, and **Development Team,** otherwise known as a Scrum Team.

## Scrum Team

A close up of a logo

Description automatically generated Two adjectives characterize the Scrum team. First, Scrum Teams are self-reliant who are capable of fulfilling the work without the need for outside supervision. The teams are qualified to choose the most suitable methods to reach their Sprint Goals. Second, the Scrum Teams are cross-functional by having the necessary skills and the capability to finish the full product. The number of people within Scrum Teams varies between 5 to 9 individuals who are committed to the scrum process **(15)**.

The Product Owner is the person in charge of the overall product and is in charge of maximizing R.O.I. (return on investment). The Product Owner’s responsibilities include, but are not limited to, ownership of the Product Backlog, management and prioritization of items within the Product Backlog, coordination with the Scrum Master, and maintaining the overall vision of the product **(3)**.

The Scrum Master, on the other hand assists and educates the Product Owner, Development Team, as well as the rest of the organization on the proper use of Scrum **(3)**. They serve as a link between the two and help support the overall organization by removing impediments, providing coaching, and Scrum Masters protect teams from either external or internal distractions. The Scrum Master is also a servant leader who is there to help the Development Team meet their goal. They also serve as a facilitator and they ensure that everyone follows the Scrum practices **(3)**.

The Development Team is in charge of actually building the product that the Product Owner indicates. The team is comprised of cross-functional members that can meet the desired outcomes of a Sprint and should have all the necessary skills to meet every goal of that Sprint, from the beginning of the development cycle to the end **(3)**. There is no team leader in the Development Team, as teams decide everything as a group. Also, Development teams choose what items to build within a Sprint and decide together on the best way to complete that Sprint **(3)**.

## Events & Ceremonies

Within the 3-5-3 structure, the “5” represents the Events or “Ceremonies”. The five Events within the 3-5-3 structure of Scrum are as follows: **Sprint Planning**, **Sprint**, **Sprint Review**, **Daily Scrum**, and **Retrospective (2)**. Another meeting/ceremony that should be noted is the Sprint Refinement. Usually occurring once per Sprint and lasting a couple hours, the Refinement meeting is held to keep the Product Backlog up to date **(16)**. On the other hand, Sprint Planning is the Event where the actual planning for the upcoming Sprints takes place, in order to determine the goals of the Sprint and to determine or agree on what is considered “Done” **(4)**. Also, this is where items from the Product Backlog are moved into the Sprint Backlog for the Sprint. The duration of the Sprint Planning meeting is directly tied to how long it will take to complete a Sprint. A Sprint Planning meeting should be about two hours per week of each sprint.  For example, a one-week Sprint, the Sprint Planning meeting will be 2 hours. For a two-week Sprint, the meeting will be 4 hours, and so on **(5)**.

## Sprints & Daily Standups

A group of people in a room

Description automatically generatedAll of the work for a Scrum project is broken down into smaller projects with increments of time associated with the smaller portions of work referred to as Sprints. The time it takes to complete a Sprint varies, and it can be from a few days to a few weeks. Sprint timeframes usually don’t go over one month of time **(5)**. Each day of the Sprint is where another event takes place, the Daily Scrum. The Daily Scrum is a short meeting that usually doesn’t last more than 15 minutes, and each member of the team is asked three questions. The questions are as follows: “What did I do yesterday to help achieve the sprint goal?”, “What will I do today to achieve the sprint goal?”, and “What, if anything is impeding or blocking progress toward the sprint goal?” **(5)**.

The last two Events that we will cover are the Sprint Review and Retrospective. The Sprint Review is a review that takes place at the end of each Sprint. The purpose of the Sprint Review is to demo the working product with everyone involved in the Scrum Project and to get feedback from the Product Owner **(6)**. This is where, based on the feedback, the Product Owner can add additional items to the Product Backlog to be used in a future Sprint if necessary. The Retrospective is where the Development Team meets to reflect on the Sprint, as in, what was done well and what could be improved on **(6)**. It is more of an internal discussion between Development Team members.

## Artifacts

The last “3” in the 3-5-3 structure of Scrum, represents the Artifacts. Now, there are many different artifacts that companies can use or implement, but we will only be going over three Artifacts that are commonly used within the 3-5-3 structure of Scrum. These three Artifacts are the **Product Backlog**, **Sprint Backlog**, and **Product Increment**. The Product Backlog is owned by the Product Owner and is a dynamic list that contains all of the “features, functions, requirements, enhancements, andfixes” for the product. Otherwise known as User Stories, Epics or Themes, and the backlog can be updated to add new product requirements **(7)**. This is also where items are given a priority and estimated timeframe.

The Sprint Backlog is owned by the Development Team. It is a list of items that the Development Team selects from the Product Backlog and includes the overall plan on how to complete the Sprint. The backlog is a visible list that shows all the items that need to be worked on, items that are having trouble or are “blocked”, and also items that are complete and meet the Development Team’s definition of “Done”. The Sprint Backlog is also controlled by and can only be updated or modified by the Development Team **(4)**.

The final artifact that we will be going over is the Product Increment. The Product Increment is the sum of all the items from the Product Backlog that were completed within the Sprint, and the Sprint must meet the Development Team’s definition of “Done” in order to start a new Increment **(4)**. All the items within that Sprint must be in a complete working state by this stage.

# History of Scrum

The article “The New New Product Development Game" was written by Hirotaka Takeuchi and Ikujiro Nonaka and published in the January 1986 edition of the Harvard Business. The article was based on a survey performed by analyzing how successful companies such as Honda, Fuji Xerox, and Canon were developing high-quality products within a specific time. These companies have been utilizing similar patterns to provide new quality merchandise. Hirotaka Takeuchi and Ikujiro Nonaka defined a flexible product development method where the development teams worked as a unit to reach a common goal **(8).** They developed a new way of creating new products that they called holistic or "rugby" approach, which consisted of passing the ball back and forth to each member of the team. The holistic approach was based on manufacturing case studies from different industries. According to the article "The New New Product Development Game," using the new approach helped to increase the productivity of the company. For instance, products less than five years old account for 25% of sales, companies indicated that the rugby approach would account for one-third of all profits **(8)**.

  After publishing the article" The New New Product Development Game" by professors Hirotaka Takeuchi and Ikujiro Nonaka, Ken Schwaber and Jeff Sutherland were inspired by their analysis, and they decided to apply it to their domain, which was software development. Ken Schwaber and Jeff Sutherland elaborated on the Scrum concept and its applicability to Software Development in 1995 in Austin, Texas, during a presentation of the Object-Oriented Programming Systems, Languages, and Applications (OOPSLA) conference. Following the conference, several Scrum practitioners, experts, and authors have adopted and improved the Scrum conceptualization and methodology **(9)**.

# Modern use of Scrum

Within the world of software development today, Scrum is widely popular. In a recent study provided by SlashData, a study of just under 12,000 participants, Scrum was the number one framework used within the field of software development **(10)**. Companies like Intel, Adobe, and Amazon have all used Scrum in the past, and still today continues to use Scrum to tackle projects where this particular framework shines. Throughout this section, we will take a look at the implementation of Scrum within Intel, Adobe, and take a look at the state of scrum over the last few years.

## Denube Technologies, Inc.

A case study provided by Denube Technologies, Inc. on the Intel Corporation, shows the use of the Scrum framework for product development. Intel implemented Scrum “by the book” at first, and then tailored it to fit their specific project needs. Intel showed, that by implementing the Scrum framework and modifying it to fit their needs, they had made large improvements in four major areas of development. The four areas that improved were Cycle Time, Performance to Schedule, Moral, and Transparency. Cycle Time is the total time it takes for a unit of work to move from the very beginning of a process to the end of that process **(11)**. Intel’s Cycle Time reduced by around 66 percent after introducing the Scrum framework. Along with Cycle Time, Performance to schedule metrics also made vast improvements as they “virtually eliminated schedule slips and missed commitments” **(12)**.

## Adobe

Adobe implemented Scrum for their Adobe Premiere Pro team. Adobe Premiere Pro is a video editing software focused around editing video, film, and corporate videography **(13)**. A study by Peter Green, a certified Scrum Trainer for Adobe Systems, details the Scrum adoption process and the results of that adoption for the Adobe Premiere Pro team. The study began by displaying how Adobe software teams would spend too much time on certain aspects of the development process, showing a need for change. This resulted in Adobe eventually starting the Scrum adoption process for their Adobe Premiere Pro team. This change was greatly beneficial for Adobe.

When comparing the development cycle of two versions of Adobe Premiere Pro version CS4 and version CS5, the number of defects that were found in CS5, the version for which Scrum was implemented, was only 43 percent to the number of defects found in the CS4 version for which Scrum was not used **(13)**. This was a drastic change from the previous version, in which teams spent a majority of the development cycle just fixing those defects. Other Adobe teams saw the success of the Adobe Premiere Pro team and eventually adopted Scrum as their framework as well **(13)**.

## Scrum Alliance

 In a survey called “State of Scrum 2017-2018”, completed by the Scrum Alliance, shows the state of Scrum over the last few years. This survey had over 2000 respondents, 27 different industries which represented 91 countries from around the world. The Scrum Alliance is the largest nonprofit association in the Agile community, with over 500,000 certified practitioners worldwide **(14)**. The survey shows that Scrum is widely used around the world and this data set shows the spread of Scrum Masters around the world as follows: the U.S. with 48%, India at 7%, Germany 6%, UK 5%, and both Canada and Australia tying at 4% in the fifth spot **(14)**. The survey also showed that IT and Software Development are the two most common fields that have implemented Scrum, with IT at 39% and Software Development at 27% of the reported Scrum users. The non-IT departments that use Scrum the most are Operations or Production at 42%, followed by Research and Development at 31%, and Sales and Marketing at 25% **(14)**. Overall, this survey displayed the wide use of Scrum around the world and how Scrum is currently being utilized in multiple fields and departments within companies.

# Conclusion

The Scrum methodology allows for a line of normalized communication between customers looking for solutions and development teams that can help create them. It also employs tools that make it easier to organize and prioritize tasks generated from customer needs. This is made possible by a set of assigned roles with specific tasks to maintain the practices.

Much like anything else, Scrum is not perfect. To maintain the positive aspects of the methodology, the practices require a level of diligent adherence that could be difficult to keep up with. Specifically with communication between team members. And on the flip side, Scrum become very meeting heavy. It may become difficult to keep meeting as concise as they need to be to keep everyone happy.

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# Interview One

This in-person interview was conducted on 11/12/19. The interviewee is a project manager for an internal software development team comprised of permanent and contract employees. He has held the position for the past two years.

**1.** What role do you usually take (Product Owner, Scrum Master, Team Member)?

**A:** Generally, Scrum Master but sometimes fill in as the Product Owner.

**2.** What is the connection between Scrum and Agile?

**A:** Agile is a philosophy where as Scrum is a methodology. With Agile, small, self-managed teams are formed with a defined amount of work. The work itself is broken down into smaller pieces or stories which the team pick and choose what they want to work on.

Scrum is how the work is done. Using the methodology, teams organize and prioritize the stories to help the members decide what to work on.

**3.** Why people tend to put Agile and Scrum in the same sentence?

**A:** Sometimes it tends to be a mistake or misnomer that some from ignorance. The words Agile and Scrum will be used interchangeably even though they are not the same thing.

**4.** What do your Scrum meeting schedule look like?

**A:** Two-week sprints

**Daily Standups**. These are quick meetings, usually held at the start of the day for all the team members to touch base. Each member says what they worked on the previous day and what they plan on doing today. The member then finishes by saying if they can proceed with their work, “blocked” or “not blocked”. These meetings are meant to be quick check ins and should be less than 15 minutes.

**Sprint Review**. Demo working code. At the end of sprint, a team member demonstrates a draft of a finished product. This is the time that the finished product matches what the product owner wants, and the quality of the work is peer reviewed.

**Sprint Planning**. Usually 1 hour per week and comes after the review. After seeing what has been completed, stories are reevaluated to determine the priority list needs to be rebalanced. At this point, the team can get a better idea of how long tasks take and use that to help pick new ones for the next sprint. This also helps determine how time-consuming stories are and if they should be broken down into smaller tasks.

**Sprint Retrospective**. This is a team only meeting that should exclude the stakeholders and product owners. Ideally this is held concurrently with the Sprint Planning or Sprint Review. The retrospective is a meeting to reflect on the work that was done in the previous sprint. This acts as a progress report for the team members. The idea brought forth in this meeting should be in the vein of constructive criticism.

**5.** How has scrum helped with solving problems and if so, how?

**A:** Scrum has helped with problem identification and prioritization. It did so by bringing in the concept of Minimum Viable Product or MVP. When a Product Owner describes a large project that they would like MVP helps drill down to the most important features needed. This helps narrow the focus and deliver a working product faster, even if it doesn’t necessarily come with all the extra features on initial release.

It also helps with timelines and communication with external groups. Including Production Owners in the meetings allows for some transparency between the team and its customers. The Product Owner can see in the meetings what the timelines look like and gain a deeper understanding of how long tasks will take.

**6.** Has scrum hurt in any way and if so, how?

**A:** Scrum hurts when the team is siloed. The Scrum team should have members from all groups the project is associated with. If the team is siloed or its external members do not take an active role, communication suffers and could result in a bad product.

Another challenge if team members do not understand the methodology. As it is an abstract concept, it can be difficult to know why you’re doing something or the benefits that come from following the Scrum rules. A common example is the Daily Standups taking too long which can lead to resentment.

**7.** Can Scrum be applied to all types of projects? Why?

**A:** No. If a project is too small and/or does not have more than one or two people working on it. The ceremonies of Scrum become unnecessary. Teams that are too large are also a bad fit for Scrum as the ceremonies, especially the Daily Standup would become too onerous.

**8.** If you could add something to make Scrum more effective what would it be?

**A:** To make Scrum more effective all participants should have a good understanding of how Scrum works and a strong grasp of the terminology. For example, a Product Owner should know what a User Story is.

Also, the administration behind the ceremonies is very important. Getting sloppy on record keeping like user stories and acceptance criteria can lead to delayed and bad products.

**9.** For people with not enough knowledge of Scrum, what advice can you give them?

**A:** Start with an understanding of what Agile is. Scrum is just ceremonies. Understanding Agile will provide a better understanding of why you are following those ceremonies.

**10.** Would you recommend scrum? For what type of problems?

**A:** Yes. Any kind of software development. Especially in projects that you don’t know all the steps in advance or all the solutions are not already known.

# Interview Two

This interview was conducted on 11/11/2019 with a Senior Program Manager for a consulting firm which develops various software applications based on client requirements. In addition, he has helped external companies onboard scrum into their project timelines.

**1.** What role do you usually take (Product Owner, Scrum Master, Team Member)?

**A:** TPM (Technical Program Manager) / Analyst / Scrum Master for story creation, managing

priority of tasks and project schedule.

**2.** What is the connection between Scrum and Agile?

**A:** Agile is a set of values and principles while scrum is a methodology framework to help with

the planning and delivery of products. Scrum when done correctly allows / helps the Business

and the Development Teams to prioritize work and iterate several times within a specified time

interval, generally two weeks.

**3.** Why people tend to put Agile and Scrum in the same sentence?

**A:** People use them interchangeably. Scrum allows for teams to be agile.

**4.** What do your Scrum meeting schedule look like?

**A:** We generally organize work into 2-week sprint intervals. We have scheduled 30-minute daily standups. Generally the first 15 minutes is to allow all team members a chance to give status

composed of what he/she worked on yesterday, what he/she will work on today and any

blockers. Ideally the work should be tied to a user story in the sprint. Any remaining time plus 15 minutes, is for parking lot items. The parking lot is the time slotted to discuss blockers, reasons someone is working on a story that should not be, asking time from team members to discuss requirements, etc. Our team is not doing pure scrum. If we were, we would be having formal/official scrum type of meetings referred to as ceremonies like sprint planning, demoing work and retrospectives. We do these things but we don’t have a formal process at this time for various reasons.

**5.** How has scrum helped with solving problems and if so, how?

**A:** It has enabled ability to break down and managing the work into smaller chunks. It has

allowed us to deliver features to clients sooner and gather feedback in an iterative manner.

Over time we tend to be able to communicate what work will be completed within a time interval. Though there are times which the scope of work is more complex than anticipated or

something else taking priority and pushing it out.

**6.** Has scrum hurt in any way and if so, how?

**A:** Scrum is no perfect system. As with all processes there are positives and negatives. A few negatives that come to mind is that that team members don’t have the proper training to start. Feature requirements are broken into smaller pieces that the big picture isn’t always clear to all team members. It requires more communication between the business and development teams. The tools available to help manage scope and requirements are not the best. Tools on the market are specialized in managing the deployment of code, test cases and product requirements but not necessarily all parts. Upper management and business teams have this belief that because stories are broken into smaller components, that anyone on the team can pick up but just because something is smaller doesn’t mean anyone can do the work. It would require a higher performing team of multiple skills and experience levels to figure things out.

**7.** Can Scrum be applied to all types of projects? Why?

**A:** No. Non-operational or operational support type of tasks or anything that is a set of

repetitive tasks. For example: The process to change how a team would change tires on a car

would be project that scrum could be applied to. Scrum would not be good to manage the

constant changing of tires for each vehicle.

**8.** If you could add something to make Scrum more effective what would it be?

**A:** Providing guidelines to team members and business owners around what scrum doesn’t do

well. People tend to grasp to certain terminology without understanding both good and bad use

cases.

**9.** For people with not enough knowledge of Scrum, what advice can you give them?

**A:** Learn about agile and scrum. There are several free online guide/sources available, there are pocket books that provide basic understanding, and get on a team. When on the team listen and reflect on what is working is well and good go better. It is important to understand the scrum principles and reasons why/when to apply them. Applying them just because is not helpful.

**10.** Would you recommend scrum? For what type of problems?

**A:** Yes. Any non-operational / repetitive task type of problem.