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| Central Connecticut State University |
| Process Description |
| SCRUM – Applying the Framework |
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Paper # 2

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## Introduction

### Technical definition

Within the scope of Project Management of software products Scrum is an iterative and empirical “framework within which people can address complex adaptive problems, while productively and creatively delivering products of the highest possible value” (Schwaber & Sutherland)[4]. This framework sets forth a set of roles for the people involved in a software development project, a series of events that occur during the process and the artifacts that flow through those events to produce a potentially deliverable portion of the overall project. It uses many concepts borrowed from “Lean Manufacturing Principles”. The official "Scrum Guide" is available at <http://www.scrumguides.org/scrum-guide.html> (Schwaber & Sutherland). This Paper is an attempt to summarize the Scrum Process Framework presented in the official "Scrum Guide"[4] into a more ordered process explained in lay terms.

### Purpose and Function

The purpose of Scrum is to provide a project management process that can handle incomplete and or rapidly changing customer requirements. Scrum is one of several project management systems geared toward software and systems development that arose (Beck & others, 2001)[1] due to backlash against the traditional “Water Fall” method. The "Water Fall" method placed heavy emphasis on knowing all customer requirements before starting a project and delivering a product to a fixed contract. See figure 1. In contrast Scrum's emphasis is on maintaining close communication with the customer to handle changing requirements.

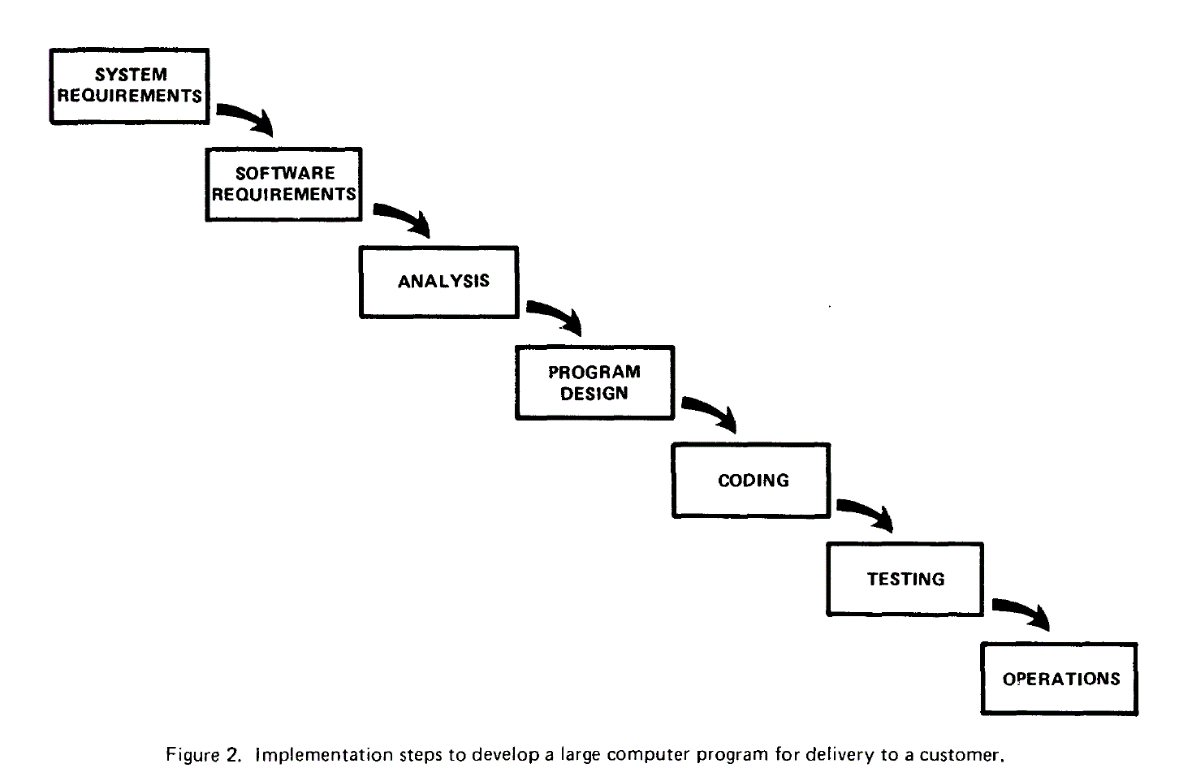


Figure 1 | Traditional Waterfall Method (Royce)[2]

### Process Overview

At the start of a new Scrum project the Scrum team gathers initial customer requirements and Creates a Product Backlog. Within a Scrum team there are three roles, the Product Owner, the Scrum Manger and the Developers (the people performing the actual work). The Product Owner’s main task is to act as the interface between the customer and developers. The Scrum Master’s Job is to ensure that the team is following the Scrum Process, to guard the team from outside distractions (like company executive progress inquiries) and educate the rest of the business on the Scrum process. Finally, the Developers are the people doing the actual product development work.

With the initial team and product backlog in place a continuous series of work cycles take place called Sprints. This overall cycle of Sprints end only after the product is deemed done. Within each sprint a series of smaller events take place starting with the Sprint Planning Meeting, then the daily Scrum meeting to track progress through the Sprint period. At the end of the Sprint a Sprint Review meeting is held with both Scrum team and customers present. Finally, a Sprint Retrospective meeting is held for the team to evaluate its execution of the Sprint.

  
Figure 2 | The Scrum Process [5]

### Gather Requirements

The Product Owner is the sole point of contact of the Scrum team with the customer. Thus, the Product Owner takes responsibility for gathering product requirements from the customer for a requested product. The Product Owner works with the team to analyze the requirements and create a product Backlog which is a collection of features of the overall product to be worked on.

### Sprint

The Sprint is the “Container for all the other events” (Schwaber & Sutherland)[4] in the process. Its Purpose is to keep each iteration of the project small and measurable which protects against the scope of the project creeping out of control. The Sprint should be a two week to a month-long time-boxed event. Each Sprint's Goal is to deliver a working subset of the final product to the customer. Sprints continue in this iterative fashion until the team has reduced the Product Backlog items to zero and has reached its definition of done.

### Sprint Planning Meeting

The Sprint Planning Meeting is where the team decides which Product Backlog Items (PBI) to work on and how to turn them into finished features. The meeting is time-boxed to a maximum of 3 hours in length. During this meeting, there are two main questions to be answered, "What can be done this Sprint?" and "How will the chosen work get done?” (Schwaber & Sutherland)[4] The first question is where the team decides which PBI's to include in the sprint. Question two drives the team to split each PBI into smaller actionable steps that will bring the PBI to completion. These smaller steps generated by the team and the PBI's they belong too are called the Sprint Backlog. Producing the Sprint Backlog is the deliverable goal or artifact of this meeting.

### Daily Scrum

The Daily Scrum is a 15-minute meeting that happens at an agreed upon time every day. Its purpose is for the team to review their progress and raise any issues getting in their way. In the meeting, everyone physically stands which is meant to encourage everyone to keep their contributions short & direct. Each person on the team should answer three questions; "What did you do the day before?", "What are you working on today?" and "Are you having any issues?"(Schwaber & Sutherland) [4].

### Sprint Review

The Sprint Review is a meeting that occurs at the end of the Sprint where the Scrum team reviews its progress with the customers and or stakeholders. The purpose of the meeting is to give the customer a chance to provide feedback to the Scrum team to refine or add new requirements to the project. The Sprint review can be up to three hours long however the time-frame should scale with the length of the Sprint. Only PBI's that the Scrum team considers complete and deliverable should be reviewed. The Scrum team should then demonstrate the completed areas of the project. During these demonstrations the Product Owner captures customer feedback for the Scum team to review at the next Sprint Planning Meeting.

### Sprint Retrospective

The Sprint Retrospective is a meeting for the Scrum team to inspect its successes and challenges during the last Sprint. The purpose is to allow a safe and open venue for the team to make improvements in how it operates. It is the Scrum Master's Job to ensure this meeting happens and that the atmosphere of the meeting is cooperative and collaborative. Again, the meeting should be three hours or less depending on length of the Sprint. The team should review its successes first and record what worked well. Then the team should look at the challenges they encountered and develop ways to Improve those areas and create a plan to implement them.

### Conclusion

In Conclusion Scrum is a Product Development Process that assumes a large degree of risk due variability in a product’s requirements and that what is unknown about how to complete a product can outweigh what is known. Scrum handles these risks by continuously inspecting the artifacts of the Scrum process (Product Backlog, Sprint Backlog & Increments) during the Scrum Events and adapting as necessary.

In my personal experience, the Scrum process is a rather extreme departure from typical hardware engineering processes. Most typical hardware Engineering processes are more similar to the traditional “waterfall method”. With my involvement in a Scrum team, the Scrum process has indeed improved the speed and focus of my work. Also working in a Scrum team has been a highly collaborative and enlightening experience. The biggest challenge to following the process has come from other parts of the business that do not follow Scrum.

## Citations

* [1] Beck, Kent, and Others. "Manifesto for Agile Software Development." Manifesto for Agile Software Development. N.p., 2001. Web. 04 Mar. 2017.
* [2] Winston Royce, “Managing the Development of Large Software Systems”, Proceedings of IEEE WESCON 26 (August): 1–9,1970. <http://www.cs.umd.edu/class/spring2003/cmsc838p/Process/waterfall.pdf> printed from Proceedings, IEEE WESCON, August 1970, pages 1-9. Copyright © 1970 by The Institute of Electrical and Electronics Engineers, .328 Inc. Originally published by TRW.
* [3] "Learn About Scrum." What is Scrum? An Agile Framework for Completing Complex Projects - Scrum Alliance. The SCRUM Alliance, n.d. Web. 22 Feb. 2017.  
  \*Why Is It Called Scrum? When Jeff Sutherland created the scrum process in 1993, he borrowed the term "scrum" from an analogy put forth in a 1986 study by Takeuchi and Nonaka, published in the Harvard Business Review. See more at: <https://www.scrumalliance.org/why-scrum#sthash.GGacCoIa.dpuf>
* [4] Schwaber, Ken, and Jeff Sutherland. "The Scrum Guide™." Scrum Guide | Scrum Guides. Scrumguides.org, n.d. Web. 27 Feb. 2017. <http://www.scrumguides.org/scrum-guide.html>

[5] The Scrum Framework. Digital image. Scrum.org. N.p., n.d. Web. 22 Feb. 2017.<https://s3.amazonaws.com/scrumorg-website-prod/drupal/inline-images/ScrumFramework_2000x1000.png>. <>.