Does The Scrum Methodology Always Work?

Eðvald Möller
The School of Business
University of Iceland

Abstract

In a traditional project management methodology, the whole process of project is organised from the beginning to the end. Goal, scope, cost and time schedules, risk and project closure are usually defined, as an example. When working on a project for software companies, part of the work is creative and the scope of the project and its closure are not, therefore, always predictable at the beginning of the project. The goal can be clear at the beginning but, as the project progresses, the process may change with regard to the customer 'swishes. Therefore, a traditional project management methodology may not always be suitable. The 'Scrum' methodology is based upon the agile ideology and is popular in projects that focus on software development because it acknowledges the importance of the human factor and that the skill of those involved in the project is crucial to the project's success. The Scrum methodology needs the cooperation of those involved in the project. The main objective of this article is to introduce the conclusion of a study conducted in 2014, to examine if the Scrum methodology could make it easier for Icelandic companies to have better control over projects.

Keywords: Scrum, Agile, traditional project management, processes, sprint, Scrum master, Scrum team

Research methodology

Many projects are set up where the final product or service is not defined at the beginning but progresses over time. This happens in an environment where fast changes can happen in a project and the direction of the project might change rapidly while working on it. In this kind of environment, there is much need of flexibility and a quick response. More often than not, in software and product development, the final product is not always known, therefore the more traditional project management methods are not always the most suitable. A large part of the data and references were retrieved from a qualitative study conducted with selected individuals and organisations. Qualitative research is a method that provides descriptive data in the participants' own words and behaviours (Bogdan and Taylor, 1998).In his book, *Interviews,* Steinar Kvale (1996) describes the purpose of qualitative research interviews is to collect information and obtain description of the participant´s world view. He states that an interview is a conversation between two people and their common interest. He considers it a special form of human interaction, in which knowledge evolves and moves between the participants in the conversation. The selection of participants was in accordance with their interest in, and involvement with, the Scrum methodology. Our long interviews were conducted with seven participants within six companies' which have a thorough knowledge of Scrum, either as professionals or users within the companies that had applied the methodology. The author believed this method was the best way to reach those who had the most knowledge of, and interest in, the subject.

What is Scrum?

Introduction

Scrum was developed in 1986 by Hirotaka Takeuchi and Nonaka Ikujiro, as they wanted to find a new way of increasing speed and flexibility in the production process of a new product. They compared this new method to a rugby game, in which the team tries to reach the end of the pitch by passing the ball between them so that the whole team moves steadily up the pitch, working together for the desired goal. Members of the team are responsible for their own work but there is a strong emphasis on team commitment rather than on the results of one player (Larson and Gray, 2014). The Scrum methodology is now based on another methodology, called Agile. In February 2001, 17 people met in the Wasatch Mountains in Utah. They all worked as software developers and were all pioneers in their field.

Their common goal was to develop a new methodology to manage projects that required flexibility. The group reached an agreement on a new strategy, called Agile. The group agreed on the following guidelines:

"We seek better ways to develop software by constantly improving it and helping others uses the method. With this work we have come to appreciate:

Individuals and interactions over processes and tools **working software** over comprehensive documentation **Customer collaboration** over contract negotiation **responding to change** over following a plan. That is, while there is value in the items on the right, we value the items on the left more".

In addition, therewere 12 principleslistedfor softwaredevelopment (Beck et al., 2001).

The Method/Methodology

The methodology has evolved greatly and enjoyed great popularity within high-tech and software development projects because it is easy to learn and understand. However, when new innovations are introduced, such as this methodology, it may take some time to learn them and implement them into the culture of the company. In addition, the methodology is still young and does not have a strong theoretical foundation; the majority of its development has taken place inside companies not in the academic environment. The methodology is therefore not thoroughly defined and has thus taken on various forms but this does not change the fact that it is very popular (Conboy, 2009). Group that operates according to the Scrum methodology will base its work on short sprints, where the aim is to deliver a usable product or service, or finish a certain part of a project with each sprint. At the end of the sprint, the product is reviewed in terms of its capabilities and then new goals are made for the next sprint, until the project is completed and the product is delivered to the customer (Rising and Janoff, 2000). It is said that predictability is the main difference between traditional project management and Scrum. Traditional project management is predictable and organised from the beginning until expected adjustments are needed in the project. Scrum, on the other hand, is unconventional project management, where unpredictable events are expected in the work process. At the beginning of the project, a task list or wish list is made and then certain product backlog items are selected that are important to develop from the start. Scrum-controlled projects are then continuously reviewed and improved during the work process (James, 2014; Larson and Gray, 2014).

Process and Roles

Scrum methodology is based on three key roles or characters: Project Owner or Project Manager, Scrum Master and group members, i.e., participants with other expertise that are involved in the project. The owner of the project is called the Product Manager. The role of the owner is to communicate the customer´s requirements to the Scrum team, and they need to carry out a robust analysis of the customer´s needs so the results will be in accordance with their wishes. The owner of the project makes a list and logs everything that needs to be done, sometimes called user stories. That list describes exactly what will be done and why. The owner presents the project to the project team and helps to make a plan for each sprint; this is an important part of the process and each sprint can last from one to four weeks (Figure1).
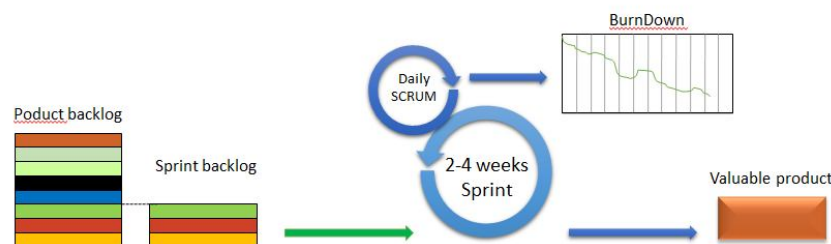

Figure1. Scrum sprints

At the beginning of each sprint, the owner and the team go over the products that need to be delivered at the end of each sprint and, when all participants have agreed upon the product list, it cannot be edited. When the sprint has started, the owner of the project cannot change their mind, they cannot change when the process has started in each sprint. At the end of each sprint, a meeting takes place where the team presents the product to the owner and other appropriate individuals.

The owner agrees whether the task has been satisfactorily completed or not and meeting is then held regarding possible improvements to the product and possible changes by the owner (James, 2014). The role of the Scrum Master is comparable to a project manager. They are not the manager of the team; rather they help the team to control itself. The Scrum Master is typically part of the team, works in the team and is responsible for ensuring that the team follows the Scrum methodology. They are the main contact person for the owner of the project and assist the team to create a work schedule, organise daily meetings and plan each sprint. One of their roles is to take care of the team, make sure communications flow, and see that everyone works well together, knows their part in the project, shows responsibility, and has a clear vision of the project.

The Scrum Master has to resolve disputes that may arise without warning and hold daily Scrum meetings. The meetings usually start at the beginning of the day, short and coordinated, lasting about 15 minutes, and held in a circle in front of the project board. The team goes through a list of questions and each member of the team is asked to answer the following questions:

- What have you done since the last Scrum meeting?
- What will you do after this meeting until our next meeting?
- Have any problems arisen that are delaying your part in the project?

The Scrum Master can therefore pay attention to the progress of the project but the aim of the meeting is to enable all the team members in the project to respond to any obstacles (Beck et al., 2001). The Scrum methodology uses a project white board to plan each sprint so it is possible to have an overview of the sprint in question, in a simple and convenient way. The team can see how each work phase is progressing in each sprint in the project. The project white board is usually divided into three columns: work to do, work in progress and work completed. Work phases (user stories) are written on Post-it notes with the name of the team member who is working on it. In this way, team members obtain a good overview of how the work phase is progressing within sprints and gain satisfaction when assignments move between columns (Ionel, 2009). The requirements may change if appropriate, and stakeholders are asked to give their opinions on the project. Afterwards a meeting is scheduled where possible improvements to or changes in the product are discussed and changes in the needs of the owners.

The meeting is primarily an opportunity to review and assess whether the project meets the requirements of the customer and assess whether the demands and parts of the project are re-evaluated. Before each new sprint starts, a meeting is held to review lessons learned from the last sprint, what went well and what could have been done better. Each team member outlines those activities they think is crucial for the next sprint or project. If a change is decided upon, then they are brought up in the next sprint meeting for process and implementation. In each project, there is a record of the product and the sprints; the owner keeps the records of the product and the development team keeps the records of the sprints (Rising and Janoff, 2000; Cervone, 2011; Larson and Gray, 2014). The progress of the sprint or the project is, more often than not, shown by a graph that illustrates show much work is complete and how much work is left to do (Figure 2). In this way, the Scrum Master can estimate the completion date by examining the performance of the team and making it possible for all the members to see their performance and success. The graph informs the team whether it is on schedule or not (Schwaber, 2004).
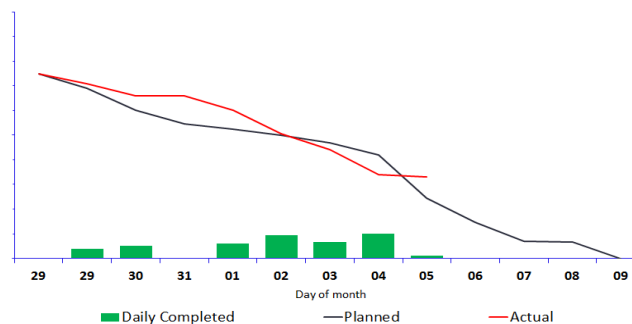

Figure2: Burndown chart

The Customer

At the beginning of the project, the customer decides upon the requirements and defines what the final product should be.

The project is carried outto meet these requirements and, as a result, it is important that communications with the customer between sprints are effective,to make the right decisions in the project's processes. If changes are necessary for the customer, the product owner has the option to change features and prioritiesat the end of each sprint, if desired.The methodology forbids communications taking place by email and insists that meetings with the customer are formal, documented and filed. As a result, meetings with stakeholders are coordinated in a way that explains anomalies (if they exist) and theprogress made since the last sprint. Only in this waywill the product improve, when all participants that have an interest in the product strive to achieve a common goal and benefit from its success. It can be concluded thata customer's involvement with the owner and theteam is the main prerequisite for a successful project, where the customer describes in detail what they have in mind and what they want to achieve; in other words, customer input shapes priority-setting activities. Items that are important to the customer have the highest priority(Rising and Janoff, 2000; Cervone, 2011).

Goal Setting

The main difference between goal setting with Scrum and with a traditional project management method is that, with Scrum, everyone in the project is well-informed about the project's objectives and each sprint makes this crucial (Nicholls et al., 2015). It is important to obtain exact details about what the customer wants to achieve with the project and it does not matter if traditional project management method is used or not (Möller, 2014). Usually, it is the project manager who has complete overview of the project's objectives and passes tasks to others to develop at the beginning of the project. However, the Scrum methodology is not considered as following a traditional goal-setting process but is based on the actual progress of the sprints. Consequently, the aim of the project is continually evolving. When every sprint finishes the process is evaluated and next steps are planned (Wang, 2013).

Planning

The team works toward a plan, in cooperation with the owner of the project. The Scrum methodology estimates the cost and time schedule between sprints and these schedules change as the project progresses. Later in the project, and when certain stages have been reached in the development of the product, the requirements of the project may change and this can directly impact the schedule. The techniques that are used for planning are based first and foremost on the knowledge and the experience of the working team, and on meetings where elements of the project are discussed, and cost and time schedules are made for each work phase. This in the spirit of a traditional work schedule and a main project plan should be in place before the project starts. The work regarding the project plan starts with the owner of the project describing the work phases for the team and the team will then create the project plan. Each work phase is then discussed in groups and questions are answered if necessary.

When the group has reached a shared vision, the work of the project plan starts and each and every member of the team estimates from their perspective how long and how complicated each phase will be. Each member will then write down their estimates but does not show it to the other team members. When everyone has written down their estimation the notes are all viewed together and, if there is a difference of opinion, each estimate is examined in more detail. If team members greatly disagree, they are asked to explain in more detail why they estimated the work phase in particular way. When a conclusion has been reached the team members review the work phase again and discuss it until they have reached a consensus. It is believed that this method increases the likelihood that all team members have the same view of the project, are aware of the scope and cost, and aim for a common goal(Heikkilä et al., 2015; Rising and Janoff, 2000). It is said that one of the biggest advantages of this method is that there is no need to make plans for the whole project in detail or even know all the phases of the project at the start. It has been suggested that this methodology is actually closer to reality than traditional project management planning and estimations (Nicholls et al., 2015). So far, the emphasis for Scrum has been on software projects.

In these projects, the aim may change quickly and requirements need to be reviewed regularly during the work phase, primarily because there is tremendously rapid development taking place in the software market. The biggest difference between Scrum and traditional project management is that, with Scrum, the project is composed of many small phases, each worked on for a short time, which makes it easier for the continual review of the project. Each phase has to be completed before taking on the next unit; as a result it is possible to make the necessary changes in a timely manner instead of using traditional project management where each phase is worked simultaneously and changes are difficult to make since the work has already begun (Cervone, 2011).

Findings and discussion

The main objective of this article is to present the results of a study carried out to examine whether the Scrum methodology could help Icelandic companies gain a better control of projects. Judging by the answers from the participants, they all agree that this methodology is here to stay. The method works well as an 'in house' tool, the method is used within and between departments in a company where cost requirement is not the prime issue. When discussing this with representatives of service and software companies, they all agreed that this method was the best way to connect with their customers. A software house was very satisfied with the use of the methodology in the partnership with their customer. Customers got the solution they wanted; however, some of them said that the solutions they received were good but considerably more expensive than they had anticipated at the start.

After the project had started, there was no point of return, the cost increased and it would have been too expensive to cancel the project. Those who used the Scrum methodology agreed that they would never build their own house with a contractor who used Scrumfor project planning because it would be too expensive and the additional cost for small modifications would rocket. Participants believe that Scrum is an ideal method for projects which can be solved with a team of four to 10. The method has become very popular in the software sector and it has come to light that it fosters innovation and allows project to be developed during the process. Most agreed that it could be difficult to follow the time and cost schedules that are set up in the beginning, since they can change in the process of the project and between sprints, but the methodology is said to give the best product to the customer, even a product that they perhaps did not even think they wanted or needed. The question is whether the cost of development and the final product will always be in accordance with expectations in all situations. The answer is no, but the participants commented that the customer is satisfied. The Scrum methodology owes its success also to the customers who participate in the production process, which ensures that the product meets their demands and needs. However, it is clear that the customer must be willing to pay for the product. When participants were asked about the cost exceeding the budget they did not want to mention any figures except when it came to projects within their own companies.

Projects which were prepared using the Scrum methodology were often 20% to 60% over budget and products were often more expensive. Several participants said that the only way to reduce uncertainty was to use traditional project management with the planning of the project, setting up time and cost schedules and milestones where the sprints would occur. In this way, they had considerably more success since they and the customer would be more aware of the time and cost. As one participant noted, 'there are no blank cheques'. The success of the Scrum methodology is mainly due to the customer being involved in the process from the beginning to end, which ensures that the product or service provided meets the needs and requirements of the customer. It is therefore necessary that each project is well organised, efficient and effective in utilising the available resources in each case as much as possible. The participants agreed that customers could be more active in the process from the beginning and would have a full understanding of what the final product should be, which is what the Scrum methodology requires(Cervone, 2011). It was stated by participants that they did not give themselves enough time to analyse the scope of the project in the beginning but that it evolved with time.

When discussing the problems with the Scrum methodology they stated that the level of uncertainty was high and it was difficult to establish accurate time and cost schedules. Nevertheless, they agreed that the methodology had many benefits since the speed of projects was often highland increased flexibility was needed between sprints. It was stated that the sprints increased transparency in the project and improved the potential of seeing the delays ahead and responding in advance, accordingly. The participants indicated that the sprints could easily go off course if there was a lack of discipline and consistency but, with the right training, the only way to build up consistency within the company is with the support of the management. The author believes that this methodology is suitable for entire projects within companies, such as sales and marketing, change management and lean management. This list, however, could go on and on, assuming that all stakeholders can meet regularly and use the Scrum methodology. With regards to meetings, constant reviews of the project and improvements; it is possible to say that the methodology is appropriate for all kinds of projects, except for simple, short-term projects. The author suggests that Icelandic companies look into this methodology so it may become a part of their culture.

References

Bogdan, R. C. and Taylor, S. J. (1998). *Introduction to qualitative research methods: A guidebook and resource* (3rd edn). New York: John Wiley & Sons.

Beck, K.., Beedle, M., Bennekum, A.V., Cockburn, A., Cunningham, W., and Fowler (2001). *Manifesto for Agile software development*. http://agilemanifesto.org/

Cervone, H. F. (2011). Understanding Agile project management methods using Scrum. *OCLC Systems & Services, 27*(1), 18–22.

Conboy, K. (2009). Agility from first principles: Reconstructing the concept of agility in information systems development. *Information Systems Research*, *20*(3), 329–354.

Heikkilä, V.T., Paasivaara, M., Rautiainen, K., Lassenius, C., Toivola, T., and Järvinen, J. (2015).Operational release planning in large-scale Scrum with multiple stakeholders - A longitudinal case study at F-Secure Corporation. *Inf. Softw. Technol. 57*, 116.

Ionel, N. (2009). Agile software development methodologies: An overview of the current state of research. *Annals of Faculty of Economics, 4*(1), 381.

James, M. (2014).*Scrum reference card.* http://scrumreferencecard.com/scrum-reference-card/

Kvale, S. (1996).*Inter Views: An introduction to qualitative research interviewing*. Thousand Oaks, CA: Sage.

Larson, E. W. and Gray, C. F. (2014).*Project management.* New York, NY: McGraw-Hill.

Möller,E. (2014). *Verkefnastjórnunogverkfærið MS Project*. Garðabær: DHB.

Nicholls, G.M., Lewis, N.A., and Eschenbach, T. (2015).Determining when simplified agile project management is right for small teams.*Eng. Manag. J.27*, 3–10.

Rising, L. and Janoff, N.S. (2000).The Scrum software development process for small teams. *IEEE Softw. 17,* 26–32.

Schwaber, K. (2004). *Agile project management with Scrum*. Redmond: Microsoft Press.

Wang, G. (2013, 16 September). *Manage objectives, actions, and uncertainty in Scrum.* http://www.scrumalliance.org/community/articles/2013/september/manage-(objectives-actions-and-uncertainty)-in-scr