

# A Scrum tool for improving Project Management

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## Abstract

Scrum is a new approach to project management. Instead of having a lengthy plan-driven project you work in small 15-30 day iterations with daily stand-up Scrum meetings where you use some simple visual tools to create a team feeling of progress. We have developed a specially designed Scrum tool. In this paper we show that this tool improves the way an architectural firm, Arkitema, uses Scrum.

First we observed Scrum in daily practice and interviewed the users at Arkitema and later on in other companies as well. As a result we identified a need for a better tool to visualise the different user stories, with high accessibility and where project history and overview are the main elements. To address that need we undertook an iterative and participatory design process including a number of usability tests.

Our conclusion from the tests is that Arkitema's use of Scrum improved with the help of the Scrum tool that we designed. In this paper we present our development process and describe the design of our tool. Finally, we discuss whether the Scrum tool we developed will be useful outside the context of Arkitema and reach the conclusion that the tool can be used for other companies as well

## Introduction

Two main positions exist in project management: Classic plan-driven management and more contemporary agile project management [1]. One of the most well known methods in plan-driven project management is the waterfall model, where each phase of the project is planned in advance and there are clearly delineated interfaces between phases often called "gates". Recently project management methods have gone through a development resulting in alternative methods: The agile project management methods, to which Scrum belongs. As the word "agile" indicates, this method is able to respond to frequent and unforeseen changes in the project.

Scrum is an iterative design method. The word Scrum originates from rugby, and refers to the situation where the team is gathered to plan the following part of the game[9]. This also describes the essence of Scrum where the team gathers each day and informs the others of their current work situation (the daily Scrum). This meeting should last no more than 15 minutes and be conducted with all team members standing up.

Scrum runs in short sprints varying from two to four weeks. Before each sprint, a sprint-planning meeting is conducted, where the work for the upcoming sprint is determined and con-

verted into user stories. After each sprint all product related work should be in a state ready for release. This distinguishes Scrum from plan-driven project management, in that you get visible and tangible results that the customer can relate to[8].

Besides the Scrum team there are two important roles: Scrum Master and Product Owner. The Scrum Master facilitates the project and works to protect the team from external interruptions. He or she also runs the daily Scrum meeting. The Product Owner represents the customer's needs and commands and is also the person who writes and prioritises the user stories. Finally you have the team, which is the working force responsible for the delivery of the product under the facilitation of the Scrum Master.

## Delimitation

The main purpose of the project was to design a tool to visualize and assist project management with Scrum. In this study we have focused on the interest of the Scrum team as a group and on the individual's interests, and not on the interests of the organisation, whose interests are not necessarily equivalent to the interests of the team. We do however believe that the main interest of the organisation should in most cases be the same as that of the team.

This study has been conducted based on the acknowledgement that Scrum, for most users, is a theoretical underlying base from where their own processes are devised [4]. Also we support a constructivist paradigm, not believing in eternal requirements and theories outside a current time and space [1]. In light of this, we have overall chosen an inductive method rejecting the design goal of developing a universal tool for all Scrum managed projects.

## Gathering of empirical data

Following a literature study of the 'theoretical' usage of Scrum, the design phase was based on two qualitative interviews with two Scrum masters: Joos Jerne and Morten Stahlsmidt both from the company Arkitema, not working on the same project. Subsequently an observation of a daily Scrum meeting at Arkitema was conducted. We experienced a problematic usage of Scrum, one of the main deviations being a lack of efficiency, which resulted in the Scrum meeting lasting 32 minutes instead of the 15 minutes that Scrum prescribes. This was mainly due to the 11 team members not following the Scrum guidelines, as they went into discussions about details. We then decided to undertake an extra interview and observation with another project leader Karin Hansen and her Scrum team at the company Danske Spil. This was mainly done to create a better understanding

of how Scrum is used in different companies.

With the knowledge that Scrum is rarely being utilised as the theory prescribes, we chose to uncover the “real” users of Scrum. We further participated in a one day conference for organisations and companies, where they shared their experiences using the agile methods. We found that many companies’ usage of Scrum was working far better than that of Arkitema, this knowledge was highly applicable for optimising Arkitema’s Scrum usage. It was also our experience that Arkitema was not the only company lacking rigor in their usage of Scrum, which was confirmed by adviser Kristian Haugård from goAgile who works with helping organisations to use Scrum better.

## Specification requirement

The design focused on assisting the daily Scrum meeting. Based on the gathered data mentioned above we constructed a list of design requirement based on the needs described by the future users and experiences gathered from further Scrum users and experts. Four overall requirements were established:

1. **Intuitive user interface:** The major strength of Arkitema’s current solution is its simplicity and intuitive nature. No major introduction to the system was needed. This requirement seemed particularly important in an agile perspective with a goal of “Individuals and interactions over processes and tools” [10].
2. **High accessibility:** In the often very busy days, the company did not possess time for technical breakdowns or long boot times. At the same time the result of such problems would be a change of focus from the meeting to the tools, conflicting with the agile idea.
3. **Commitment to Scrum:** Poor physical surroundings, lack of Scrum literacy and less interest in the overall common project goals all resulted in a lack of commitment to the Scrum process and Scrum meetings.
4. **Project history:** The current tools used at Arkitema lack the possibility of looking further back into history than the current week. This resulted in time wasted on discussing previously performed (or not performed) tasks.

## Design description

The result of this study is the application that we have called Scrummer. Based on the idea of a normal bulletin board, Scrummer allows the user to move ‘post it’ notes freely within the interface[6]. Each ‘post it’ represents a user story, making it possible to switch a user story’s status, and change the person accountable. When double “clicking” a ‘post it’, a pop up window comes up with information about the user story, which can be modified. To create a new user story, the user simply drags their finger downwards.

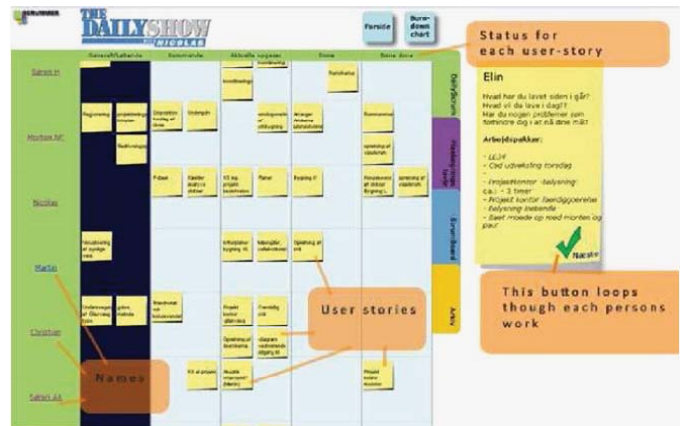


Figure 1. Screen dump of Scrummer during a test

When the daily Scrum is held, Scrummer runs a ‘wizard’ here-by guiding and supporting the process .

## Design methods

The final design was reached through three iterations: The mental design iteration establishing the concept and overall design, the physical implementation iteration where ideas were turned into code, and the adaptation iteration where the design was modified according to user needs. The three iterations were then each separated into a design phase, a test phase and an evaluation phase. The type, goal and time for the tests were specified by normatively using the Pries-Heje et al. strategic framework [7]. All design phases made use of several different methods and combinations of these. At the mental design iteration De Bonos ‘Six Thinking Hats’ [2] were combined with a brainstorm method inspired by the American company IDEO [3]. Also a preliminary analysis of technical possibilities and problems were conducted to help in determining the further approach. The ideas produced using these methods were afterwards communicated and tested by use of paper prototypes and storyboards.

The physical implementation made use of a lot of open source code found of the Internet. The adaptation of this code did consume some time but the overall time saved using pre existing code was still significant. The design was in the end reviewed through a think-aloud technique assisted by a project leader from Arkitema. At the adaptation stage two major naturalistic tests were conducted during two daily Scrum meetings at Arkitema. The fact that we had two naturalistic tests gave us the opportunity to solve some of the problems found at the first test, so the application worked even better in the second test.

## Flirting with the future

Scrummer is our response to what the future might bring within the field of project management. The final product is a direct result of the requirements found through our research, described earlier in this paper. To meet these requirements, the solution has been to take on the technology of tangible interaction effected by use of a smart board as the main user interface. The smart board gives the user the ability to interact with a large scale board, similar to a traditional bulletin board, by use of their fingers.

Making the application tangible brings a new dimension to the design, making it possible to break down the barriers between the computer interface and real life. In our context this is done by working the metaphor [5]. An example could be the use of the 'post it' note as a metaphor throughout the design hereby increasing the accessibility of the design and enhancing the general interaction. In this way Scrummer stays highly accessible by using the metaphors of the old and low tech project management tool used by Arkitema and yet brings a new dimension, such as history, commitment et cetera, by making it tangible.

## Conclusion

We have designed an application that is compatible with and supports Scrum as a project management method. Instead of making a very advanced and highly complicated design, we have focused on developing an intuitive user interface and an application that is easy to handle.

Furthermore we have with our application seen how Scrummer can help Arkitema to be more true to the Scrum theory and thus optimise their usage of Scrum. Our ex post tests show that the Scrum team at Arkitema was more active and committed and they showed a greater respect for the Scrum master, the Scrum board and hereby also the Scrum rules. With Scrummer we also added a (to Arkitema) completely new function: The ability to see earlier user stories and thereby add history to their project. This function now saves unnecessary discussion since they just have to check the archive.

The future for this application seems bright. In only three weeks Scrummer was designed and the application did contribute to a better Scrum process at Arkitema's. The tangible interface has helped the application to obtain both intuition and high accessibility. The archive function adds the history to the project without having to do a time consuming documentation of each user story, and thereby still respect the agile manifest which states: "working software over comprehensive documentation" [10].

We believe that this application, in spite of its simplicity, or maybe because of it, can be very useful for many organisations like Arkitema, who seek a tool that provides the necessary options and yet retains the intuitive user interface and high accessibility. Based on the enthusiasm of the team, we also conclude that using Scrummer in similar organisations could be an exciting alternative to more simplistic traditional tools.

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*This paper is the design argument of a submission to the SIDeR '09 Conference. The full submission, including an elaborate explanation can be found on [www.sider09.com](http://www.sider09.com)*