Virtual Reality Meets Scrum
How a Senior Team Moved from Management to Leadership

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Abstract

The role of managers in a Scrum organization is a topic of high interest with almost no research. Changes in management roles and behaviors were evaluated in a rapidly growing, social entertainment and gaming company in Finland. Sulake introduced Scrum in 2006 and within 6 months institutionalized Scrum across the organization. The company was surveyed in 2009 and responses from 19 managers and 36 non-managers were carefully studied.

The biggest challenges of Scrum for managers were keeping up with the team and learning *to "let go" and stop micro-managing the teams. Managers report Scrum increases productivity (73%), increases quality (58%), and makes it easier to change direction (84%). The role of the manager changes from telling people what to do into communicating goals and visions (a key insight of Takeuchi and Nonaka [1]). Increased responsibility of the team affects hiring practices of managers in a Scrum company*.

1. Introduction

A manager's responsibility is to run a profitable business. Part of his job is to decrease risk and uncertainty when developing software. To achieve this s/he makes plans based on the estimates made by the developers. The waterfall model is based on the idea that it is a very complex process to build software and adding or changing requirements late in process is very expensive. Therefore we need to do upfront analysis which describes everything in detail. According to this line of thinking a failed project means that you did not do enough analysis. However as software development is a complex process, emergent requirements will pop up. Planning can never predict all that needs to be done. To handle a complex process a leader needs to listen to the experts, in this case software developers. S/he needs to be ready to change direction whenever the unknowns become visible [2]

Software development has been done for decades now and we still see many projects that deliver late and over the budget. Therefore the IT industry has been looking for alternative ways of building software and an increasing number of companies are using Agile practices popularized by the Agile Manifesto [3].

There are a range of agile processes, such as XP, Scrum, Crystal and Xbreed. Over the years Scrum has emerged as the dominant agile process [4], and it is currently dramatically changing the way we build software. However many companies fail to implement Scrum despite the fact that the framework of Scrum is fairly simple. The reasons why implementations fail are many. Understanding the rules in Scrum is rarely one of them. The main reasons are the lack of success in changing a dysfunctional organization.

In Scrum work is divided into iterations of four weeks or less. The team commits to do a certain amount of work for each iteration. The team has full authority to decide how to reach their goal and they are not to be disturbed during iteration. Scrum will reveal if it is unclear what the team should be working on. It will also become clear who/what disturbs the team during the iterations. Most Scrum implementations begin in the IT department and then spread in the organization. As Scrum spreads, dysfunctions in an organization become more and more visible. Successful implementation of Scrum demands that the organization inspect and adapt to solve dysfunctions that surface. Scrum does not solve organizational problems, but it reveals them. Solving them demands hard work and open minds.

Scrum not only reveals problems, it also demands changes in the organization. Responsibility is moved from managers to developers and new needs for management arise which affect roles. Project managers and other people in an organization can no longer ask the IT people to do something for them ad-hoc. Scrum demands that the team is allowed to focus. The managers need to go through the Product Owner and often wait for at least one iteration. The things that make the teams go slower will be revealed and must be dealt with by management when problems cannot be resolved at the team level. There is no room for

command and control structure. This puts stress on the organization and managers have to learn how to behave differently in a Scrum environment. In that context managers have to learn and think like leaders and make sure they act as, and are seen as, leaders.

Two major problems of implementing Scrum come from the fact that Scrum changes the role of managers from managing to leading and the fact that implemented correctly, Scrum will make dysfunctions in an organization visible and thereby force organizational change. This is not always comfortable for everyone. One of the problems is that managers have to understand the difference of managing people, as opposed to leading people. In Scrum the manager needs to listen to the team and help them remove impediments. He needs to be ready to move in the same speed as the team or faster to be in the lead.

2. Background

To learn more about managers' role in Scrum we need to study managers in organizations that have succeeded in implementing Scrum like the Finnish company Sulake. The company was founded in 2000 as a start up company delivering entertainment software to mobile phones. It has then gradually developed its products and is now a major player in delivering global online entertainment. Their primary product is a virtual world called Habbo which targets young people all over the planet.

Sulake is headquartered in Helsinki, Finland and supported by 12 other offices around the world. In early 2009 there were more than 300 employees, and among these 80 people worked directly with Scrum teams. The company started out using an anarchistic software development process. As the company grew they could not continue in this way and changed to waterfall. This jeopardized deployment cycles and the organizational survival. In 2006 they decided to switch the company to Scrum, team by team. Within six months they institutionalized Scrum across the organization. Bottlenecks in the company now became other departments, such as marketing, finance, etc. This meant that they had to change their processes to monthly sprints like the software development teams. Most of the organization participates in the monthly sprint presentation. In 2009 they had 7 Scrum teams, 7 Scrum Masters and 10 Product Owners. There were about nine persons in each team and15 managers in the IT department.

3. Method

This study is based on questionnaires. We choose to make a questionnaire containing many open questions as little is actually known about this area. We supplemented with multiple choices about background and the areas where we felt that we had enough knowledge to make categories. It was possible to skip answering a question.

The study is based on two questionnaires, one for managers, and one for non-managers. The questionnaire for the non-managers documents the team's experience with management related to the Scrum process. The questionnaire for the managers documents how the managers manage related to the Scrum process and how they have experienced the implementation of Scrum seen from a manager's perspective. Most results in this case study are drawn from the questionnaire for managers. The survey was carried out in January 2009.

The respondents where chosen by Sulake. The questionnaire was made in Google Docs. The respondents received a link to the relevant questionnaire from Sulake. It was not registered who answered the questionnaire and Sulake has had no access to the replies.

4. Results

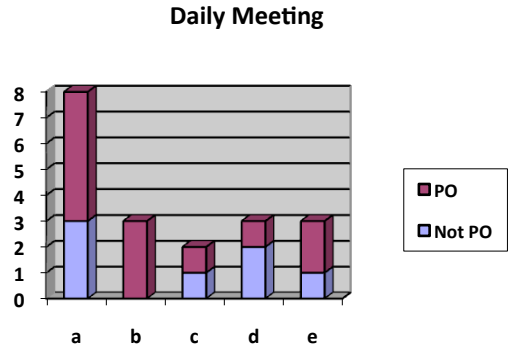
There were 19 managers and 36 non-managers who responded to this survey.

Managers' background: More than 80 percent of the managers are less than 40 years old. Half of them have worked 2-3 years in a Scrum environment. Half have worked in another type of agile environment and 80 percent have tried to work in traditional waterfall environment. 70 percent have tried to work without a defined process. 70 percent have an educational background from a technical science and 11 percent have a master's degree in business or the equivalent. 75 percent have worked with IT-development or maintenance before becoming a manager. There are 7 Scrum Masters, 7 Product Owners and 5 Team Members among the managers that responded. Some have more than one Role. Two managers have never had a role in Scrum and three do not have a role anymore.

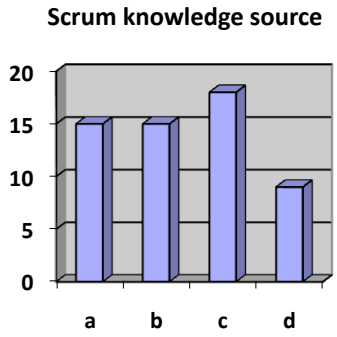
Non-managers' background: All non-managers are team members. All of them are between 25 and 44 years old and 58 percent have a technical education. More than half have worked 2-3 years in a Scrum environment. 69 percent have not tried to work in another agile environment. 27 percent have never tried to work in a traditional waterfall environment and 42 percent have more the 3 years of experience in this type of environment. 83 percent have tried to work in an environment with no process.

Daily meetings: 10 managers were either Team Member or Scrum Master in addition to their manager responsibilities. Therefore they attended daily meetings regularly. One manager never attended daily meetings and therefore the chart (see figure below) only shows the 8 remaining managers. 5 of these 8 managers are Product Owners (PO).

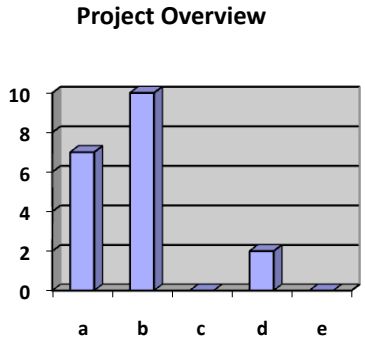
We asked the managers "*Why do you attend daily Scrum meetings?*" and gave a list of reasons: a) To get informed about status. b) To guide the team. c) To ask questions. d) To answer questions. e) To motivate the team. Product Owner (PO) responses were different than non-PO responses.



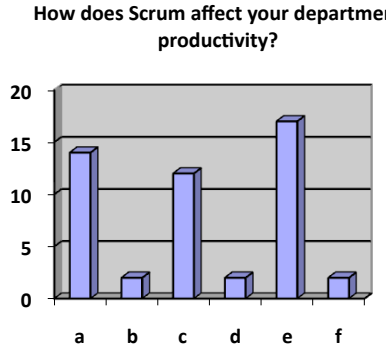
Scrum Knowledge: We asked the managers "*From where have you learned about Scrum?*" and gave a list of sources: a) Scrum certification. b) Books, blogs or internet. c) Working in a Scrum environment. d) Workshop



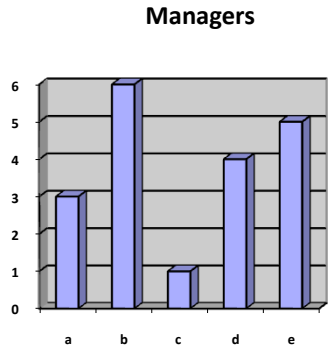
Project overview: We asked the managers "*How does Scrum affect your knowledge of the status of the project?*" and gave a list of options: a) Much better. b) Better. c) The same. d) Worse. e) Much worse.

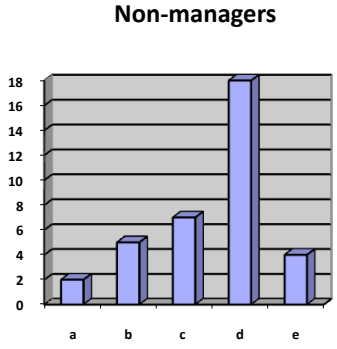


Productivity: We asked the managers "*How does Scrum affect your department productivity?"* and gave a list of options: a) We produce more. b) We produce less. c) The quality is better. d) The quality is worse. e) Changing direction is easier. f) Changing direction is harder.



From idea to implementation: Both managers and non-managers have been asked "*How does Scrum affect the time from ideas to implementations*?" We gave a list of options: a) Significantly increased. b) Increased. c) The same. d) Reduced. e) Significantly reduced. Differences between managers and non-managers appear to reflect point of view. Global product delivery accelerated but individual changes often had to wait for the start of a new sprint.





Cooperation between departments: We asked the managers **"***How does Scrum affect cooperation between departments?"* as an open question. 13

managers answered this question. One answered that it did not. The answers from the 12 others varied. Most managers reported a positive effect but there where some problems. On the positive side 4 managers reported that there where more transparency between departments. One of these reported that they had realized that some teams from different departments worked on the same goal. They then optimized team composition by reorganizing the teams.

Synchronization between departments was also reported as being affected by Scrum both in a positive and a negative way. Two managers reported that it was easier to synchronize between departments. But two reported that it could be a problem to agree on a prioritization of things affecting other projects.

Three reported on better communication between departments.

One manager did not feel that Scrum fitted his needs. He saw the Sprint as a delaying factor. When he had a problem it was usually one that could not wait one Sprint to be solved.

Hiring people: We asked *"Has using Scrum changed the skills you are looking for when hiring people? If Yes, please describe."* 12 managers answered this question. One of them never hires people. All managers that described skills they are looking for today, look for people that are flexible, with an open mind and good social skills. 9 managers report that the have changed required skills when hiring people. Two managers have not changed what skills they are looking for and they describe how their previous preferences match Scrum: "*Scrum, to me, is a pretty idealistic process in the sense that you need good, motivated people for it to work well. And those are the people I've been looking for in the past anyway.*" Three managers describe how it sometimes can be an advantage to hire inexperienced developers: "*The "easier" knowledge spreading in Scrum makes it even easier to hire a junior with great potential than a senior stuck in her ways".*

What Scrum changes: We had an open question - "*Please describe the 3 most significant differences between working as a manager in a Scrum environment and in a non-Scrum environment".* There was a lot of variation in the answers but it was possible to group some of them.

Four respondents felt that increase in productivity was one of the most significant changes in working in a Scrum environment. Furthermore two respondents reported how they saved time on documentation: "*Less time wasted documenting something no one will ever read".*

Five respondents report that one of the biggest changes is more transparency. They see more transparency in several areas from "*Everyone is much better organized and up-to-date*" to *"Development results are much easier to predict now."*

Change	number of respondents	Quote
More transparency	5	*"More transparency to what the team is doing, easier follow-up, easier planning"*
Increased productivity	4	*"More things get done faster"*
More responsibility to team	6	*"Team shares a lot of the responsibilities that used to fall to the hands of a project manager"*

Word of advice: We asked managers *"What advice would you give to other managers in organizations implementing Scrum?"*

14 managers answered this question. 8 managers advice was to give it time and start slowly. The advice spanned from concrete advice like *"Do not do too many items for a couple of first sprints"* and *"Do not try everything at once. "Prototype" with 1-n teams first"* to more general advice like *"Take your time, it takes time to get used to Scrum, it won't all change overnight".* Two managers advise others not to follow the rules strictly *"Prepare for constant learning and do not read the manuals like a bible".* This is quite opposite the advice from one other manager *"Give it time and don't try to create your own Scrum. The standard framework really works."*

Challenges: We asked "*What was the biggest challenge for you in implementing Scrum?"* 13 managers answered this question. The answers had great variation.

Two managers replied that the biggest challenge was to convince Scrum skeptics. Three reported that it was hard to keep the backlog up-to-date. One manager explained that this was because the team was moving so fast. Three felt that the new responsibilities that came with the definition of the roles in Scrum were a challenge *"To give space for the developers."*

5. Discussion

What Scrum changes: When asked to describe the three most significant changes when working in a Scrum environment, managers gave very different answers. This does not necessarily mean that the managers experience it differently. The reason could be that it simply differs what pops in to their head first. Our data give an indication of what is important and a further study is needed to reveal how to rank these changes and how the responsibilities and experience of the managers affect this. One significant result is that managers do experience several changes from working in a non-Scrum environment. No one reported that they

did not experience any changes (5 managers did not answer the question). The three most common replies were productivity increase, self organizing teams, and more transparency. This confirms the results reported by the founders of Scrum [5] and several others [6]. The self organizing teams can be a challenge to accept as a manager. Six managers describe this as one of the most significant changes working with Scrum. One manager described the effect as "*It's a bit scary and hard to let go of things and rely 100% on the team, but in the end it usually pays off*". The productivity increase is also one of the most common replies. This does not come as a surprise since productivity increase has been one of the dominant benefits reported by using Scrum [7]. Sulake had the advantage of being a relatively young company. They did not have a lot of rules they had to change when implementing Scrum. This could be one of the reasons why transparency is one of the most commonly reported changes. The structure they get from Scrum makes it easy to get an overview. The transparency is reported to be better in how the projects are managed, what the team is working on, and it is easier to predict results and thereby make a reliable release.

Word of advice: The advice from the majority of managers was to start slowly and be patient. This relates very well to the advice given by Scrum coaches today. They advise people to follow the rules and understand the benefits before trying to change them.

Daily meeting: The daily meeting is meant as a meeting for the team. Only the team members need to be present and only team members and Scrum Master are allowed to talk. Therefore it is wrong to attend the meeting to ask questions.

All managers except one (including the ones with roles in Scrum) attend daily meetings (some more often than others). They all did this to get informed about status. This shows a good usage of the fact that the daily meeting together with the Burn Down Chart gives an easy way too see exactly where the team is in the current Sprint and listen to what problems they might have.

One of the five Product Owners attends the daily meeting to answer questions. This shows good responsibility for the project. It does not mean that the others are not responsible. Their project might not need further specification in the Sprint or the team communicates with the Product Owner at other times. Two managers that do not have a role in Scrum attend the daily meeting to answer questions.

In some companies teams and managers exploit the fact, that the daily meeting is the time of day that the team is gathered. They use this to give or get information. This could also be the case with Sulake. We do not know the effect of this ad-on to the daily meeting and we do not know if it is used in this way in Sulake.

Project Overview: In this case study we see that 17 out of 19 managers believe that Scrum gives them a better knowledge of the status of the project. We do not know exactly how they achieve this but 18 of the 19 managers attend daily meetings regularly. The two managers that think that Scrums give them a worse overview are both less educated in Scrum than other managers. One of these only knows Scrum from the internet and has never had a role in Scrum and he never attends daily meetings. The other knows Scrum from a workshop and has previously had a role in Scrum. He attends 8 daily meetings on average a month. This indicates that education might help managers exploit the benefits of Scrum, but further research needs to be done. It is surprising that a manager can meet with the team twice a week on average and feel that he has a worse overview of the project than before using Scrum.

Productivity: 6 managers mentioned increased productivity as one of the most significant changes when doing Scrum. Directly asked, 14 managers think that productivity increases with Scrum. Two managers say that it decreases. These two are the same two that thinks that their overview of projects get worse with Scrum. But they are both among those that think that the quality is better. In total 11 think that quality gets better. One thinks that quality is worse. He is also characterized by being less educated in Scrum than the rest of the managers. His knowledge of Scrum comes from working in a Scrum environment.

16 think that it is easier to change direction. One thinks that changing direction is harder. He/she also marked it as being easier. This makes sense since you can change direction faster on a project level. But you will always have to wait a Sprint. This makes it slower on a day-to-day basis.

Cooperation between departments: The managers report the positive effects that are well known from Scrum like more transparency and communication, but this time on a department level. Two managers specify that one of the reasons for the increased transparency is that the demos at the Sprint Review give an easy way to follow the progress of other departments.

They also report positive and negative effects regarding synchronization. It is easier to synchronize once you have agreed on the prioritization, but this can be a problem between projects with different Product Owners. This could be solved by introducing a Chief Product Owner to handle disagreements on prioritization of items which affect other projects. One manager mentioned that it was a problem that he had to wait for the next Sprint to get work done. He felt that his problems normally could not wait. This indicates a

problem with communication. If his problem really could not wait the responsible department should make time for support during the Sprint. If it actually could wait they had to agree that this was the price to pay for letting the developers focus. One manager actually mentions this as a positive effect. He feels that being allowed to put things into a backlog and wait for the next Sprint to handle them makes cooperation between departments easier.

From idea to implementation: Managers are very split on the question of how Scrum affects the time from idea to implementation. Things happen in the world of virtual reality at a very fast pace. The management team says the market can change over night. When they walk into the office in the morning, everything may need to be changed. So the pace is faster at Sulake than at most companies.

9 managers think that Scrum increases time from idea to implementation. Another 9 managers thinks that it decreases. From a managers perspective the time can increase because he can no longer ask the teams to change direction immediately. But it decreases if some ideas before Scrum had to be approved by a comity or meant a lot of re-planning. The different opinions could be explained if some managers see the big picture and some focus on the daily details. Also management generally agrees that Scrum increases productivity. In the past, a new idea might have been implemented more quickly at the expense of destroying productivity of the team. Managers often do not have good data on team velocity and have not studied how it varies and what causes it to increase and decrease. Further studies are needed to understand these differences of opinion.

The non-managers have a majority that thinks that the time to implement a new idea has decreased. If the new idea relates to how things should be done the team can include the idea in the current Sprint. This is a major improvement compared to plan driven development. If the idea changes the product it needs to be accepted by the Product Owner. But a team member in Scrum can get new ideas into the backlog immediately. From a team members point of view this can be perceived as the idea gets acted on faster. It is built in to the Scrum process that the best ideas should be highest priority. This assures that new ideas will only change the plan if there are worth it and they will not interrupt the flow of the team.

The difference between the managers and non-managers perception of time from idea to implementation is not surprising. Before Scrum a manager could dictate an immediate change but he price would be a disturbance of the flow. Now the managers need to wait at least a Sprint. But a team member will experience that new ideas are acted on immediately.

Attitude: A manager's attitude to Scrum seems to be correlated with education. We do not know if the education can change the attitude. A manager that already has a positive attitude towards Scrum probably seeks education in Scrum more often than managers with a negative attitude. If the company focuses on educating managers in departments where the benefits of Scrum are most straightforward the well educated managers will be the ones that see the most positive effects of Scrum. The majority of managers report many benefits from Scrum but three managers seem more negative towards Scrum than the rest. They are characterized by less education in Scrum and two of them are not technical, and the last one does not describe his work areas.

Managers' role: We see a change in the responsibilities and the tools that the manager gets in a Scrum environment. Some of the new responsibilities can be challenging. In Scrum the team has to commit to an assignment. When they have committed the team is responsible to make a solution that fits the goal. To do this they need to accept the need for an assignment and understand the assignments goal. One manager describes how s/he can no longer use her/his position to give orders. S/he needs to argue if s/he wants the team to take on new assignments or do things differently. . Therefore a manager in Scrum needs to have good communication skills. This puts extra challenge on the manager's role.

Scrum changes what a manager needs to focus on. For example the team in Scrum takes much more responsibility. Therefore the manager does not have to spent time on details "*Less time on micro management because the team does it by themselves*". When a team has committed to some work items in the next sprint, things run pretty much by themselves. Some team members find the new responsibility natural and others need motivation from the manager. One manager describes this as one of the most significant changes with Scrum "*Pushing and motivating the team members to organize and take responsibility instead of organizing the team*".

The increased productivity and flexibility demands that the managers need to move faster on environmental issues if they want the full benefit of the flexibility. This also is an extra challenge for the manager "*You have to be able to rapidly understand new and sometimes complex challenges in order to find the right solutions*".

One manager describes how Scrum affects cooperation with other departments. Today she/he has more time to focus on the cooperation because the team does not need so much attention during the Sprint "*It leaves more time for it, because the team is in a self-guiding mode when sprinting*". The managers can also skip some reporting upwards. This can be a challenge for some managers to let go of. One manager describes this when asked "*what was the biggest challenge in implementing Scrum?*" s/he answered: "*Getting to understand that with Scrum some parties have to give*

up something e.g. management reporting (since it had no purpose anymore, demos have replaced those reports)".

Scrum gives the managers a number of new tools to lead by. Everybody is more up to date not only when it comes to their own projects. The demos gives helps managers to get informed about other projects. *This makes cooperation easier as "In general all units and personnel got more direct information about projects since teams have their demo session*". The cooperation also gets easier because of the Sprints "*Since things are done in Sprints of equal length it is easier to synchronize.*" This is also supported because deadlines become more reliable "*Co-operation is better because all teams can count on delivery dates and plan their own Sprints accordingly*". It also becomes easier to focus on current work. One manager describes how the product backlog helps "*Backlog helps on request from other departments (requests are moved to backlog and don't disturb current work).*"

Team's role: The role of the team also changes with Scrum. They need to take more responsibility. This is reflected in the skills managers in Scrum look for when they hire new people. The managers are looking for people that can take responsibility and initiative. They look for people that are open for discussions and who have an open mind. To the question about whether Scrum has changed the skills they look for one manager replied: "*Definitely. I appreciate new hires that have a truly open mind and don't take anything for granted.*" A goal in Scrum is to distribute skills. This is one of the new challenges for managers. One manager describes this: "*As a Scrum Master I feel the biggest challenge is to avoid the "person who knows best does the job" syndrome. In other words the challenge of getting (more) even distribution of skills within the team*".

6. Conclusions

We can confirm previous results [5] that Scrum has a positive effect on synchronization, communication and transparency. What is new is that we can report it on the department level. The Sprint review plays an important role in this result. The demo makes it easy for everybody to get informed about the status on other departments' projects.

The majority of managers report a positive effect on productivity, flexibility and quality when using Scrum.

The dominant reason to attend the daily meeting for managers in Sulake is to get informed about status. We see that the majority of managers in Sulake exploit this.

We see that managers in Scrum focus on hiring flexible people with good social skills. For some managers these skills have always been highly prioritized but the majority have changed their focus in some ways when working in a Scrum environment. Scrum also makes inexperienced developers more attractive.

We see that Scrum changes the role of managers. A manger in Scrum needs to communicate visions and goals instead of listing requirements. S/he needs to be able to motivate the team and stop focusing on details. S/he needs to be able to move fast when the environment changes.

One of the things that separates Sulake from many other companies are how well educated the managers are in Scrum. They are also special because they have adapted all of the company to follow the rhythm of Scrum. Results indicate that this could be one of the reasons they have succeeded in implementing Scrum.

7. References

[1] H. Takeuchi and I. Nonaka, "The New New Product Development Game," Harvard Business Review, 1986.

[2] D. J. Snowden and M. E. Boone, "Leader's Framework for Decision Making," Harvard Business Review, 1 Nov 2007.

[3] M. Fowler and J. Highsmith, "The Agile Manifesto," Dr. Dobbs, July 13 2001.

[4] VersionOne, "3rd Annual Survey: 2008 - The State of Agile Development," Version One2008.

[5] K. Schwaber and M. Beedle, Agile software development with scrum: Prentice Hall, 2002.

[6] G. Benefield, "Rolling Out Agile at a Large Enterprise," in HICSS'41, Hawaii International Conference on Software Systems, Big Island, Hawaii, 2008.

[7] C. Jakobsen and J. Sutherland, "Scrum and CMMI – Going from Good to Great: are you ready-ready to be done-done?," in Agile 2009, Chicago, 2009.