

SOCIAL AND COMMUNICATION CHALLENGES FOR AGILE SOFTWARE TEAMS

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Abstract

Agile methods are being widely used in industry and government projects as a way of delivering IT software projects. We report results from a survey about agile team work and a follow-up interview study. Themes emerging from the interviews were team tension, method adaptation and cultural change. We discuss the implications of practitioners' experiences and views, and highlight some of the social and ethical challenges for IT developers working in organisations that adopt agile methods. We take as the focus of our work, a view that cultural shifts are essential to agile working, and that these require an intensive commitment from individuals, teams and organisations.

Keywords

Agile Methods; Social and Ethical challenges; Team working.

1. Introduction

Evidence suggests that agile methods are being widely adopted and used in industry and government projects (West and Grant 2010). In the UK the most popular agile methods in use are Scrum, XP and DSDM. The underlying principles of agile development are expressed in the agile manifesto, and are briefly summarised in the following statement:

“We are uncovering better ways of developing software by doing it and helping others do it. Through this work we have come to value:

- Individuals and interactions over processes and tools;
- Working software over comprehensive documentation;
- Customer collaboration over contract negotiation;
- Responding to change over following a plan.¹”

These principles form the basis for all agile methods, expressing a focus on people-centred, pragmatic, collaborative and flexible software development. The agile approach is characterised by incremental and iterative development of software with frequent delivery of finished products that provide business value. Underlying this approach are core practices, such as working in co-located, self-organising teams, having small regular meetings, working flexibly to accommodate change, actively involving customers in the development process, and using retrospectives and feedback to improve practice.

As a result of the growth in uptake of agile methods, we are interested in understanding how they are practiced by teams of developers on the ground. One of the criticisms levelled at the agile community has been that its claims for success are largely unsubstantiated (Dyba and Dingsoyr 2008). Despite this, in the UK, agile project management is becoming very popular

¹ <http://agilemanifesto.org/>

and in March 2011 the Institute for Government made recommendations for improving government IT by adopting agile approaches, and is tracking progress on the changes set out in the Government ICT strategy². As one of the key components in the agile approach is team work and frequent interpersonal communication (Sharp and Robinson 2010), we have focussed our research on investigating agile teams. We are particularly interested in team communication (Markham 2009), and how the use of agile techniques impacts on the working experiences of software developers and other professionals who work in agile teams (Whitworth and Biddle 2007). We discuss results from two exploratory empirical studies with the aim of teasing out some of the social and ethical issues that arise.

We undertook a survey during summer 2012 to explore team structures and communication approaches used by agile teams. This was followed by two semi-structured interviews, the aim of which was to gain a more detailed understanding of how individuals experienced team work and which aspects they found most challenging.

2. Agile Team Work Survey

The questionnaire consisted of ten questions asking which agile method teams used; typical team size; team member location; how the team communicated; meeting frequency; meeting attendance; meeting type; meeting recording; experience with agile, and finally an assessment of how agile the team were. The aim of the survey was to assess what variety there was in the way that agile teams were constructed.

The questionnaire was targeted specifically at practitioners who were already working in an agile team. It was distributed to agile practitioners in the UK both in paper and online formats. The paper copy was distributed at two conferences in which a majority of the attendees were agile practitioners. Additionally, it was distributed electronically to agile business groups using distribution lists and LinkedIn groups such as BCS Agile Methods, AgileNorth, Agile DSDM, Agile Yorkshire and Agile Scotland.

Thirty-seven completed questionnaires were received. The most commonly used agile method was Scrum (38%), followed by mixed methods (for example 'a hybrid of XP and Kanban', 30%), Kanban (16%) and DSDM (11%). Team sizes varied between 4 and 30, with a mean size was 6. However, 70% of respondents stated their teams consisted of between 4 and 8 members. Most respondents reported that they were co-located in a dedicated work area (73%), with only 11% reporting that they worked in globally distributed teams. 81% said they regularly had face-to-face meetings and 19% used electronic communication. Also most respondents (78%) reported that they had daily team meetings, with 13.5% have weekly or bi-weekly meetings and 8% meeting less frequently. When asked to describe how decisions were recorded, electronic shared documents were the most frequently used tool (65%) followed by wall charts (46%), other means (19%), paper-based documents (8%) and unshared electronic documents (2%). In terms of meeting attendance 49% stated that all team members attended meetings, and 46% said most team members attended meetings and 2% said that meeting attendance was poor. 18 respondents answered questions about how long the team had used agile methods and how agile their team was (as these were added later to the online survey). Of the respondents who answered this question the range of experience with agile methods was 1 to 10 years, with a mean of 3.2 years. This group of respondents also answered a question about how agile they thought their team was on a scale of 1 to 5,

² <http://www.instituteforgovernment.org.uk/our-work/more-effective-whitehall/fixing-flaws-government-it>

where 1 is hardly agile at all, and 5 is totally agile. Of these 2.7% rated their team as 2, 15.2% as 3, 21.6% as 4 and 8.1% as 5; the mode was 4.

These survey results indicate that our survey respondents use a variety of agile methods, including mixed methods. The relatively high number of respondents using mixed methods indicates that some teams find they need to adapt agile methods to make them workable within their organisation. Scrum was the most popular single method used, and was also frequently mentioned as a hybrid method. This is unsurprising as Scrum is a framework approach for software development teams and it is structured by a small number of simple team practices such as the sprint planning meeting, the daily scrum, the sprint review and the sprint retrospective (Schwaber 2004). It does not contain as many software development-specific practices as XP and hence is a more generically usable method.

Our results suggest that many of our respondents have been successful in implementing the core agile team-management techniques of working in small co-located teams, meeting daily and managing shared documentation in the workplace. The fact that most respondents stated they worked in co-located teams was particularly interesting as this can be a difficult requirement to fulfil. However, despite this, less than half of respondents said their teams had full team attendance at meetings. Quite a few teams used paper-based documents such as wall-charts, as well as electronic documents. In general there was a surprising homogeneity amongst responses, and many appeared to be achieving core agile team work practices. However, some comments that respondents added to the bottom of their questionnaires indicated that there are other issues to be teased out about agile team work. One respondent commented that:

“cultural differences need to be taken into account as we work with a diverse group of people, this means that whilst some will communicate problems or issues freely other may not.”

Another view was:

“I work with many teams, a couple really ‘get’ agile, but most are ‘cargo cult’; doing the practices but not understanding how to get the benefits from them”.

These responses suggest that there are different ways of being ‘agile’ and that there are issues of cultural change that teams need to get to grips with when they adopt agile methods.

3. Interview Study

Following the survey, two follow-up interviews were conducted in which interviewees were asked to elaborate on their experiences of working within an agile team. Themes that emerged from these interviews were about team tensions and dealing with disagreements; team roles and adapting methods; and team culture. These suggest that much of the focus for both success and failure within agile teams comes from the intense communication practices that are a vital part of this way of working.

3.1 Team tension

Team tension and disagreements between team members were mentioned by both interviewees. The first interviewee was quite knowledgeable about agile methods, but was working in a team that had a history of problems with Scrum, and they were still experimenting with finding a way to make the method work for them. They were also working in a distributed team so three team members were based outside the UK, in Europe, the Middle East and the US and they had to use Skype for their team meetings. The first interviewee discusses team disagreements:

“Researcher: Did you have any disagreements between members of the team, and how did you resolve them?”

Interviewee 1: Yes, there was lots of disagreement. I guess my knowledge of agile was emotional ... it was hard to get that emotion across, it was difficult. And also, just some of the practical things, like having a discussion or an argument, it was quite difficult at the time.

Researcher: Do you think it might have been useful to have some sort of argument and resolved it?

Interviewee 1: You know, just being there. You’re talking to somebody, and they’re thinking...you know, all their facial expressions you know.. and you just can’t get that across [on Skype].”

The second interviewee also talked about his experience of working in an agile team where there was a lot of unresolved tension and stress.

“The last place I was at, the biggest thing that I noticed was there was an undercurrent of tension and stress ...um ... that as an organisation they weren’t fostering the practices you know like ... Forming, Storming, Norming and Performing ... they weren’t going through those, they were still stuck in Forming. And the slightest bit of tension in order to kind of solve problems was quelled, so they never got past that stage.”

3.2 Team roles and adapting methods

Both interviewees mentioned that their teams adapted methods, and that there were problems resulting from missing team roles especially with getting sufficient input from business customers. Both interviewees worked in Scrum teams, in which the customer role is represented by the ‘product owner’. Interviewee 1 talked about the problem of not having a proper ‘product owner’:

“Researcher: What about users or customers? Were there any users or customers in the team?”

Interviewee 1: No, no direct involvement. So the face of the customers would have been more the marketing arm... they bring back feedback from the customers and feed that back into the system

Researcher: Did someone act as the Product Owner in your team?

Interviewee 1: Yes. That role moved from person to person – this also caused issues. There were 3 different people who managed that role in my time at the company. The first person left the company, and then it rolled back to the head of the company, and then it was too much work for him to take on so he tried to distribute it back to somebody else. And the way they managed that were very different, and their visions for the product and their techniques were very different and that caused a lot of issues.”

Interviewee 2 also talked about method adaptation, and the problems with not having a product owner who was fully integrated into the team:

“Researcher: Were there any Scrum techniques that you decided not to use?”

Interviewee 2: No, they used most of Scrum. Where they had problems is tracking the monitoring the work. So Scrum basically has 3 statuses: not done, in progress and done, and this wasn’t suitable for them because they had 6 different environments and the work would

get pulled through, not only by them but also by other projects, so they had to track it through the 6 environments as well so I think they ended up with about 20 different categories.

Researcher: In terms of roles, did they use all the roles in the Scrum team?

Interviewee 2: They used all the roles, although from experience both the last [job] that I had and the previous two, the Product Owner role was very much an executive role, so they provided a strategic view and the business analyst provided the actual product owner role themselves so they wrote the stories rather than the product owner."

3.1 Cultural change

The importance of cultural change was highlighted in both interviews. Interviewee 1 talked about his recent experience as a new-comer in an agile team that had been together for a while. He discussed the problems of isolation in a distributed team, and the way that the team culture created uncertainty:

"a lot of the work was lone soldier – if that makes sense – so instead of working together with different people, you went off and did your own thing.... some of it was cultural as well – taking that on board and sort of dismissing some of the techniques and things like that. So they had tried some of the techniques before I started with them, they tried Scrum by the book but it didn't work for them so they went off and just sort of rolled back to what they were used to."

In contrast, Interviewee 2 gave an example of successful agile teamwork in a newly formed agile team:

"We had this whole interesting experience of having to build this practice, and overcome all the previous culture in the organisation also looking at developers that don't want to do agile, product owners that were new to it and didn't understand how to write stories but knew the benefits and wanted to make that successful, traditional project managers which were moving from command and control to servant-leadership, so there were huge changes around everything and in a matter of I would say, 4 sprints, that's 12 working weeks, we managed to turn about 90-95% of the people towards agile, changing the style from command and control to servant-leadership we got all the ceremonies working well and the retrospectives, the daily stand-ups, sprint planning sessions, all the reporting set up and done, which we did from scratch all the burn-downs, the product backlogs."

4. Discussion

We take as the focus of our work a view that the cultural shifts that are essential to agile working require an intensive commitment from individuals involved in the team, but these shifts have repercussions beyond individuals and teams, into the organisation. This leads us to question how practitioners experience agile working, the extent to which they view it as a positive improvement, and whether there are any ethical questions we need to ask about the acceptability of this way of working.

One of the main consequences of working in an agile way is the increased amount of face-to-face working that teams engage in. The rationale for getting teams to co-locate is to help them to spot and solve problems more quickly as they can talk with colleagues sitting in the same room rather than only discovering problems during formal reviews. However, this way

of working can be quite intense. Both interviewees in our study gave examples of experiencing unresolved inter-personal tension in agile teams. Obviously tensions can occur in any working environments but as agile teams experience a more intense form of working relationship, these tensions are harder to avoid. There are potential problems with asking IT developers to work in high-intensity teams, as many are introverted and are more comfortable working on their own (Capretz 2003). Another activity characteristic of agile work is the commitment to delivering outputs in short time-boxes, which can also put a lot of pressure on staff. These can be seen as a form of micro-management through which staff are tracked and controlled. The use of wall charts and kanban boards to promote a visual workplace, also explicitly exposes the work patterns of individual staff to public scrutiny. We question whether, in the wrong hands, some of these practices can be used to coerce and control staff.

Working collaboratively with customers is the third principle in the agile manifesto, and is a core practice embedded into agile methods. Interesting parallels can be drawn between this and the tradition of participatory design (Iversen, Halskov et al. 2010). Agile techniques, such as the use of facilitated workshops in DSDM, are designed to provide ways of ensuring that stakeholders can have meaningful input throughout the development cycle. However, both our interviewees talked about problems with getting customers into the team, and anecdotally we have heard other agile practitioners discuss this problem. This is often explained as a practical problem of not having easy access to someone with the right business or user knowledge because they are too busy, located elsewhere, or hard to identify. But there are other aspects to this problem. Customer collaboration is costly as customer representatives need to work regularly with the development team because of the iterative nature of agile projects. Some customers struggle to see the benefits of collaborative working, so they don't buy-in to it. Also, we have seen cases where managers act as proxy for 'customers' as a way of maintaining control over projects, so while they devolve control of low level tasks to the agile team, they retain overall strategic control (Thompson and McHugh 2009).

We have found that cultural issues are important in agile development, at different levels, organisationally, within the agile team and individually. Both interviewees mentioned the importance of having the right culture within the team. The second interviewee was a Scrum Master and therefore was able to influence and develop the culture within his team. However, the first interviewee was a programmer whose suggestions were not listened to by the team, and he felt the team wasn't working very well because they had not developed a good agile 'culture'. Agile teams can have problems because they feel like they are working against the culture of the organisation, and this can leave them struggling to achieve their aims. In contrast, there can also be a sense of positive energy in agile teams, as ownership of working processes can be empowering and creative. There are a number of very enthusiastic advocates of agile development. It may be that software developers associate more strongly with their professional identity than their organisational identity. This is perhaps why there are many agile evangelists in the software engineering profession, and many examples of organisations in which agile approaches are being adopted from the bottom up (Marks and Scholarios 2007).

5. Conclusions

Our study found that the agile teams surveyed were largely successful in implementing the core agile team-management techniques of working in small co-located teams, meeting daily, and using shared visual documentation. A variety of agile methods are being used including mixed and adapted methods. Themes emerging from the interviews were team tension,

method adaptation and cultural change. When we explored these in more depth we found they contained some interesting contrasts around control and organisation. We believe these are worthy of further scrutiny.

6. References

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