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Orla McHugh
National University of Ireland Galway

Kieran Conboy
National University of Ireland Galway

Michael Lang
National University of Ireland Galway

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Orla McHugh
Business Information Systems
J.E. Cairnes School of Business and
Economics
National University of Ireland Galway
orla.mchugh@nuigalway.ie

Kieran Conboy
Business Information Systems
J.E. Cairnes School of Business and
Economics
National University of Ireland Galway
kieran.conboy@nuigalway.ie

Michael Lang
Business Information Systems
J.E. Cairnes School of Business and Economics
National University of Ireland Galway
michael.lang@nuigalway.ie

ABSTRACT

This research is an exploratory study, which investigates how the use of three agile practices - the daily stand-up, iteration planning and iteration retrospective - may contribute to motivation or de-motivation in an agile team in two different European countries; namely Ireland and Sweden. Several studies recognize that motivation is an important issue in software development and have identified factors that motivate software developers. However, relatively little is known about motivation in an agile context or how agile practices may impact on team motivation. Seventeen individuals across two teams were interviewed. The results indicate that in both countries agile practices can contribute to team motivation and de-motivation. This study hopes to make an important contribution towards research efforts in the area of motivation and agile software development by identifying factors that can contribute to and inhibit motivation in agile software development teams.

Keywords

Agile methodology, agile team, motivation, daily stand-up, iteration retrospective, iteration planning

INTRODUCTION

Agile software development (ASD) refers to a group of agile methodologies, for example, eXtreme Programming (XP) and Scrum that focus on developing software in short time periods (iterations). These methodologies are often called "lightweight" methodologies as they differ in their approach to the traditional predictable plan-driven method of developing software (Boehm, 2002). They allow requirements to evolve and change during iterations, encourage close collaboration between agile teams and users, and have teams that are self-organizing and cross-functional (AgileAlliance, 2001). Each agile methodology details various practices that distinguish it from other agile methodologies where a practice can be described as a "common way of acting", which is accepted by a group of individuals as the "correct way to do things" (Hansson, Dittrich, Gustafsson and Zarnak, 2006). ASD teams can adopt the agile practices that suit their environment or that work well for them, bearing in mind that these practices may span several agile methodologies (Elssamadisy, 2007; Hansson et al., 2006). These agile practices may be technical (e.g. test driven development, continuous integration), relate to planning (e.g. iteration planning, daily stand-up), or could relate to the agile environment (e.g. co-located team, self-organizing team).

The principles underpinning ASD are detailed in the Agile Manifesto (AgileAlliance, 2001) and they place great emphasis on the agile team and the role of the individuals within the team. According to the Agile Alliance (2001) ASD teams should be self-organizing and self-managing, contain motivated individuals, be provided with the environment and support they need, and be trusted to get the job done (AgileAlliance, 2001). With ASD the team is provided with substantially more control than it would have had when using a plan-driven approach to software

development. This is a dramatic change for the project manager, who has traditionally been the primary controller (Nerur, Mahapatra and Mangalara, 2005). Project managers need to ensure their team members are sufficiently motivated to make the right decisions and complete tasks in a timely manner.

RESEARCH OBJECTIVE AND MOTIVATION

Research in the area of ASD has grown in recent years due to the increase in the number of software project teams that use an agile methodology (Abrahamsson, Conboy and Wang, 2009; Conboy, 2009; McEvoy and Butler, 2009). The focus of this study is to explore if and how agile practices may contribute to motivation or de-motivation in an agile team (see Figure 1). This research is conducted as part of a wider research project which is studying agile practices and their impact on ASD teams. Previous studies have highlighted the importance of employee motivation (Herzberg, 1968; Mayo, 1949), identified factors that motivate software development teams (Beecham, Baddo, Hall, Robinson and Sharp, 2008; Hall, Sharp, Beecham, Baddo and Robinson, 2008) and more recently a study has addressed motivation in agile teams (Whitworth and Biddle, 2007). However, little has been said about how agile practices impact on team motivation. There have also been recent calls for further research that is more practice-focused (Dybå and Dingsøyr, 2008) and to investigate how each distinct agile practice can help to optimize the performance of an ASD team (Maruping, Venkatesh and Agarwal, 2009). Consequently, three agile practices were selected for the purposes of this study – iteration planning, daily stand-up and iteration retrospective (see Table 1), on the basis that they are amongst the more commonly used agile practices by practitioners (VersionOne, 2009). They also complement each other with each of the practices related to the management and control of an agile project which requires the collective participation of all team members.

Agile Practice	Description
Iteration Planning	The iteration planning session is a meeting that takes place at the start of each iteration where the team collectively define and plan tasks that must be completed during the next iteration (Beck and Andres, 2005; Schwaber and Beedle, 2002)
Daily Stand-Up	The daily stand-up is a short daily status team meeting lasting a maximum of 10-15 minutes typically conducted at the same time each day. The meeting is conducted with team members standing up. During the meeting team members explain briefly what they accomplished since the previous meeting, what will be completed by the next meeting and indicate any impediments that may prevent them from completing their current tasks (Elssamadisy, 2008; Schwaber and Beedle, 2002).
Iteration Retrospective	An iteration retrospective is a meeting that is held at the end of each iteration where the project team reflects on what went well in the iteration, what did not, and what could be improved for future iterations (Elssamadisy, 2007; Schwaber and Beedle, 2002).

Table 1. Agile Practices Studied

The remainder of this paper is structured as follows. The next section provides an overview of the literature on teams, agile teams and team motivation and then introduces the research question. This is followed by details on the methodological approach for this study. Finally, the findings are presented and discussed with limitations for the research outlined.

BACKGROUND LITERATURE

Teams are groups of individuals that work together, are dependent upon one another and have one or more tasks to perform in order to accomplish various goals (Hackman, 1990; Mayer, Davis and Schoorman, 1995). They should comprise of individuals who are technically competent, are productive, and have good problem solving and interpersonal skills (Jurison, 1999). To perform well as a team all members must be committed to the team, have autonomy to make decisions; and have a supportive environment that provides the team with all the necessary resources and skills in order for them to conduct their work (Wageman, 1997; Wageman, Fisher and Hackman, 2009). Individuals must also feel that they have the support of other team members (Bishop, Scott and Burroughs, 2000) as the relationship between individuals within teams can impact on the dynamics of the team (Gruenfeld,

Mannix, Williams and Neale, 1996). For example, teams of individuals that are more familiar with each other may be more effective at sharing information and views than those who are not (Gruenfeld et al., 1996).

Agile Teams

Teams can be manager-led or self-governing and self-managing (Hackman, 1990). ASD teams are considered self-managing (Cockburn and Highsmith, 2001) as they have responsibility for managing their own work and behaviors but, others usually make decisions about goals, team structure, and organizational supports (Barker, 1993; Cohen, Chang and Ledford, 1997; Manz and Sims, 1987). These types of teams are empowered and have autonomy to make decisions about their tasks and the processes that they use, which are traditionally the responsibility of supervisors and managers (Alper, Tjosvold and Law, 1998; Cummings, 1978). However, the team must conform to any existing standards within the organization such as coding standards, hardware/software platforms etc. (Schwaber and Beedle, 2002). Yet, it cannot be assumed that by putting a group of individuals together in a team and calling them 'self-managing' means they are automatically agile (Moe, Dingsøyr and Dybå, 2010). While the optimal size of an agile team has been debated, ASD teams are typically small with no more than ten team members (Schwaber and Beedle, 2002). Team members have a range of skills, are cross-functional and have the ability to complete the required tasks (Elssamadisy, 2008, p128). To ensure an agile team produces quality work, an appropriate and supportive environment must be available to team members: - for example, ensuring availability of required tools, and open-office space to facilitate open communication. There is also a necessity for team members to be cooperative, collaborative, trusting, have good relationships with each other, and be able to make decisions quickly (Cockburn and Highsmith, 2001).

Agile Teams and Motivation

With the continuing pressure to deliver successful software projects and new ways of working, such as agile methodologies, it is important to effectively manage how software developers are motivated (Hall et al., 2008). Each individual team member should be motivated to use their abilities in the best interests of the team or organization (Walsh and Schneider, 2002). There are several prominent motivation theories including the work of Herzberg (1968), which help to explain the intrinsic and extrinsic factors that motivate software developers. Intrinsic motivators come from the work itself and relate to the personal goals and aspirations of the individual, whereas extrinsic motivators relate to the working environment and whether that working environment meets the needs of the individual (Asproni, 2004). Beecham et al. (2008) detail a comprehensive list of factors that motivate and de-motivate software developers (see Figure 1), which is used as the basis for the analysis of data from this study.
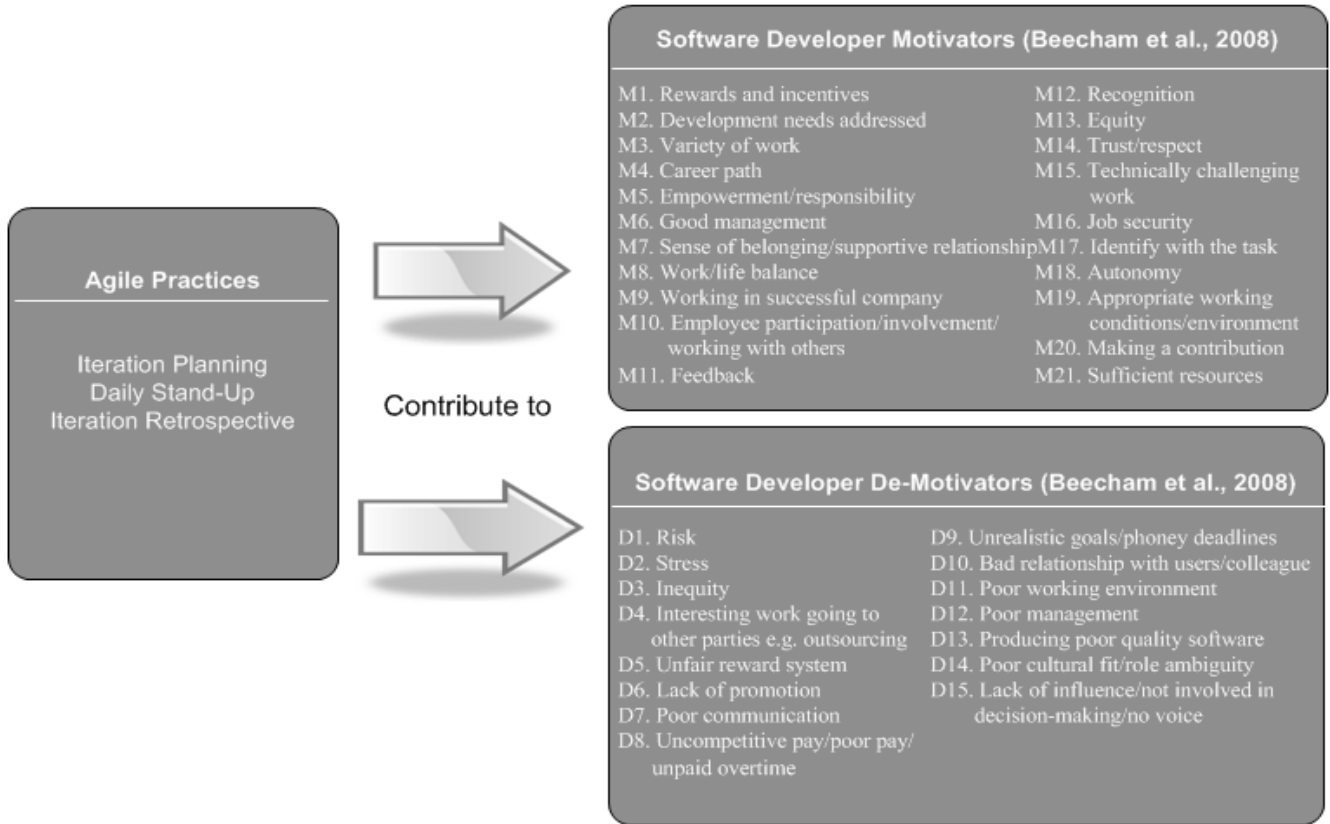
Figure 1. Research Model

Using an agile methodology can potentially increase the motivation of an agile team for a number of reasons. Agile projects are divided into short iterations where the goal can clearly be seen by all (Hansson et al., 2006). Agile teams are in theory given the autonomy to monitor and manage themselves and should be allowed to do so, with minimal interference from other personnel with higher authority as unnecessary interference can cause a lack of motivation and commitment if team members feel their decisions are being undermined (Hackman, 1990). Team members can motivate and influence each other's behavior through frequent meetings and communications (Das and Teng, 2001), for example, the daily stand-up. They can be motivated to develop their skills by learning from more experienced personnel and encouraging each other to take responsibility for specific areas of the software system (Hansson et al., 2006). These are just some examples of how an agile team may be motivated and it is possible that many different agile practices can contribute to a team's motivation. This leads us to the following research question which will focus on the three agile practices detailed in Table 1:

> *RQ. How do agile practices contribute to motivation or de-motivation in an agile software development team?*

RESEARCH METHODOLOGY

To answer this research question a qualitative approach was used as we wished to gain a deeper appreciation of the nuances of ASD teams in action within their natural organizational setting. The unit of analysis was the ASD team. As an ASD team is a cohesive atomic unit (for example, if the team succeeds or fails then it is a collective success or failure), we sought to understand the views of each individual team member on how agile practices may motivate or de-motivate the ASD team with the aim of obtaining a collective viewpoint of the team. Two exploratory case studies were conducted to identify differences and similarities across teams in two different cultural settings. Data was collected using semi-structured interviews.

Data Collection

The ASD teams were selected on the basis that they had implemented and were using an agile methodology and the three agile practices as detailed in Table 1 for a minimum of 6 months. While the cultural and industry setting differed there were similarities between the teams. Both teams were located in large multi-national organizations working on on-going long-term projects (>1year) for internal business units. The first team studied was in a financial services organization in Ireland. The team was working on the same project for two years at the time of the study. The development team was primarily based in Ireland with the Quality Assurance function based in India and a database specialist and customers based in the United States. The second team studied was a co-located team in ABB Substation automation products based in Sweden, a unit that develops and manufactures high voltage protection and control products for an internal customer. This team has worked together for many years on a variety of projects. Both teams studied were reasonably stable in terms of their membership, but they had changed intermittently.

Data collection took place over a six month period and consisted primarily of face-to-face semi-structured interviews with team members. An interview guide was developed from the literature on teams, agile methodologies, and motivation, which was used in each interview. Prompts were also documented in the interview guide, which were solely for the use of the interviewer. Sample open-ended questions and prompts from the interview protocol are detailed in the Appendix. Notes were taken during the interviews and follow-up questions or clarifying questions were asked where required. A total of 17 interviews were conducted across the two ASD teams. The interviews varied between 50 minutes and 75 minutes in length. Each interview was audio-recorded and later transcribed. The three agile practices studied were also observed in action over a limited period of time. These observations were documented as field notes. A list of interviewees and agile practices observed are shown in Table 2.

Case	Agile methodology implemented	Length of time since agile implementation	Number of interviews conducted	Average years experience in software development	Roles interviewed	Number of observations
IRE (Ireland)	Hybrid of XP[3] and Scrum[4]	2 years	8	11 years	Project Manager (1) Business Analyst (1) Developers (5) Technical Architect (1)	Iteration Planning (2) Daily Stand-up (2) Iteration Retrospective (2)
ABB (Sweden)	Scrum	9 months	9	14 years	Developers (7) Scrum Master (1) Product Owner(1)	Iteration Planning (1) Daily Stand-up (3)

Table 2. ASD Team Profiles

Data Analysis

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[3] XP is an agile software development methodology that delivers software in short development cycles with a focus on a number of values such as communication, teamwork, simplicity and feedback (Beck & Andres, 2005).

[4] Scrum is an agile software development methodology that manages and controls the process for developing software incrementally where the requirements and deliverables change regularly (Schwaber & Beedle, 2002).

All interview transcripts and field notes were imported into NVivo for analysis and were grouped by team. To address the research question the authors read through the transcripts and field notes several times. Segments of the transcripts, individual comments or observation notes relating to each of the team motivation or de-motivation factors (as detailed in Figure 1) were highlighted and coded. Beside each highlighted section the role of the individual and the agile practice referred to was noted. This helped to organize the data, identify patterns and themes across the three agile practices in relation to motivation and de-motivation and to validate the data from different individuals (Miles and Huberman, 1999). The findings for each interviewee were reviewed and validated by cross-checking the findings with each of the other interviewees and also cross-checked with the observation field notes.

FINDINGS

The two ASD teams studied were predominantly well-established, experienced, self-organizing teams with team members appearing to have a good work ethic and track record of delivering on what had been promised. Consistent with prior research individuals on both teams were personally motivated by factors such as interesting and challenging work, responsibility and the opportunity for growth and development as part of a defined career path. However, this study extends the literature in relation to software developer motivation by reporting how the use of agile practices can contribute to motivation (Table 3) or de- motivation (Table 4). The impact of the agile practices on each motivating and de-motivating factor as detailed in Figure 1 was examined. A number of the factors were clearly not impacted by the agile practices studied (e.g. rewards and incentives; development needs addressed, career path, lack of promotion, uncompetitive pay), or there was no evidence to support that they contributed to motivation or de-motivation of team members.

Contributors to Motivation

The findings did show that the agile practices contributed to motivation in a number of different ways, which are summarized in Table 3. Explanations of each of these factors are detailed in this section.

Variety of work

The iteration planning meeting provides a forum in which team members can easily and openly verbalize their preference to work on specific task(s) in order to improve their knowledge and skills in a certain area, which is motivating when, "*people want areas of work where they would learn the most… to acquire certain skills [Developer, IRE]*". It can also be used by the team to allocate difficult or complex tasks to particular individuals to motivate them to work on more difficult tasks. In ABB a difficult task is often purposely allocated by the team to a less experienced team member. However, an experienced team member is assigned to assist with the task, which utilizes the skills of the experienced developer while at the same time challenging the skills of the inexperienced team member.

Sense of belonging/supportive relationships

Both teams were in agreement that the agile practices had a positive effect on the team by motivating individual team members to participate more in the team and communicate regularly, which did not always occur prior to the use of the agile practices. The daily stand-up requires teams to communicate on a daily basis and to report verbally on progress made in the previous day. As a result, team members have become comfortable speaking openly in front of their peers and are motivated to share ideas and provide feedback. One of the more experienced developers on the Swedish team commented that this was "*a notable change in several people [Developer1, ABB]*" with several members of the Swedish team stated that they felt more like a team since the implementation of the agile practices as previously communication amongst the team may not have occurred for days. The Product Owner *[ABB]* also agreed by stating that "*all team members now feel involved*", which he believes has helped to improve team motivation. These changes are probably more noticeable in the Swedish team rather than the Irish team as the implementation of the agile methodology was quite recent and interviewees can recall how the team functioned previously.

Employee participation/involvement/working with others

In both organisations all three agile practices have motivated individuals to work very closely with one another as they are fully aware of the tasks other team members are working on, are involved in the planning for each iteration, provide feedback during the daily stand-up or in the iteration retrospective, report on progress or lack of progress and seek support if necessary. In both teams individuals actively seek help and advice as soon as it is required and will not necessarily wait for the next daily stand-up meeting to request help. The feeling from one developer in ABB is that "*if I have a problem the team will help to solve it*" and everybody is always willing to help.

Feedback

Both teams use the daily-standup as a means to highlight difficulties and provide feedback to each other on current tasks. This has become the norm and individuals are motivated to provide feedback as it is considered to be for the good of the team. The Swedish team regularly invite the customer to the iteration retrospectives for a demonstration and feedback of the software that is being delivered. During these demonstrations the customer can question the team. The Product Owner *[ABB]* believes that this is a huge motivator for the team to deliver on what was promised. This did not occur in the Irish team as the customer, while internal to the organization, was located in a different country. Both teams proactively use the iteration retrospectives to raise any issues or concerns. They welcome the opportunity to have a regular forum where these issues and concerns can be highlighted. They provide an opportunity for "*[issues] to be highlighted to your manager [Developer, IRE]*", which can be addressed earlier than they may have been previously. For the most part these concerns are listened to and are dealt with by the Scrum Master *[ABB]*, which the team find motivating. They see value in voicing their concerns because they know they will be addressed.

Recognition

Team members, including the Project Manager, or Scrum Master, have used the daily stand-up or the retrospective as a forum to informally praise each other for work completed although this is minimal in both teams. One developer did indicate his desire to sometimes "*want [praise and] recognition [IRE]*". In ABB the customer occasionally provides some positive comments during a demo of the software as part of the iteration retrospective, which is considered a form of praise or recognition "*if during the demo you get some positive comments that's a good grade [Developer ABB]*". While the teams appreciate any recognition this is not a highly motivating factor for either team.

Trust/respect

All three agile practices were identified as an important component of building trust in an agile team due to the increase in verbal communication. In particular, the stand-up is a daily touch-point for all team members, which requires team members (co-located and distributed) to meet and communicate with each other on a daily basis and "*keeps the lines of communication open [Developer, IRE]*". Speaking to each other on such a regular basis improves communication, helps individuals to better understand each other, become familiar with their personalities, traits and competencies and be more comfortable in their interactions with each other leading to increased levels of trust.

Identify with the task

Both teams feel collectively responsible to meet their goals and are motivated to help each other and work together to reach a solution when there is a problem. The iteration planning meetings motivate team members "*to set better targets [Developer3, IRE]* as team members set personal goals and make a commitment to deliver on those goals and "*no-one wants to be the person talking about what they didn't get done [Project Manager, IRE]*". It is not possible for a developer to cover up or to ignore a problem. For example, "*you can't just stand there [at a daily stand-up] and fabricate something [Developer, ABB]*; *as [we know] what everyone is up to [Developer, IRE]*". Both teams are actively involved in the planning/re-planning and allocation of workloads at the start of each iteration or during each iteration where tasks are clearly identified. In one team "*there is a common goal across the team to hit the deadlines [Developer, IRE]*" and the team is motivated to achieve that goal with "*people putting in the extra hours [Developer, IRE]*" if needed. As the development cycle is short i.e. two or three weeks both teams find it easier to clearly detail the tasks that must be completed within the required timeframe and it is motivating to "*start from a new page every two weeks where we have new goals set [Developer, ABB]*". In ABB the daily stand-up has "*helped them [the team] to set better and more accurate personal daily goals [Scrum Master, ABB]*", which is motivating for the team as they feel a sense of achievement when they meet their daily goals.

Visibility and transparency

Both teams were in agreement that the daily stand-ups in particular provide greater transparency on work completed or in progress, which is a strong self-motivator for all team members. The daily stand-up requires team members to update the team daily on progress made. As a result, the status of each task at a point in time is clearly visible to all team members. Individuals felt a certain level of accountability to the team as team members are aware of who is working on a particular task and can track progress that has been made on a daily basis. It becomes obvious very quickly to the team if progress is not made on a task and it is very easy for the team to identify problem areas, which can be addressed promptly. One developer felt that it was important on a personal level that "*you demonstrate that you are completing work on time as agreed [Developer, IRE]*". This feeling may be due to the environment in which this individual was working as the organization had recently been through a difficult restructuring, which had resulted in some job losses.

Motivators in Software Engineering	Iteration Planning	Daily Stand-Up	Iteration Retrospective
M3. Variety of work (e.g. making good use of skills, being stretched)	x		
M7. Sense of belonging/supportive relationships		x	
M10. Employee participation/involvement/working with others	x	x	x
M11. Feedback		x	x
M12. Recognition (for high quality, good job done based on objective criteria)		x	x
M14. Trust/respect	x	x	x
M17. Identify with the task (clear goals, personal interest, know purpose of task, how it fits in with the whole, job satisfaction, producing identifiable piece of quality work)	x	x	
NEW: Visibility and transparency on tasks		x	

Table 3. Impact of Agile Practices on Motivation

Contributors to De-Motivation

While there are many positive aspects of these agile practices some negative viewpoints in relation to motivation were identified by both teams. These mostly related to the daily stand-up even though the daily stand-up was considered a very positive aspect of an agile methodology. These are summarized in Table 4.

Stress

The agile practices require team members to report daily on their progress. This has had a negative impact on some team members who put pressure on themselves to deliver their allocated tasks within the timeframes agreed even though there may be circumstances outside of their control affecting their ability to deliver on a particular task. A number of individuals felt a certain amount of peer pressure at daily stand-ups and retrospectives "*to be seen to be making progress [Developer2, IRE]*" and to contribute to the conversation even though they may have nothing valuable to add. Although, several interviewees detailed that this peer pressure was self-imposed and was not a result of any direct pressure from their colleagues. Another team member indicated that it can be stressful "*to have to always deliver every day [Developer. ABB]*" with two team members indicating that they have to "*work overtime when the pressure is very intense [Developer, ABB]*" and there are tight deadlines.

Frequency of meetings

The three agile practices studied require agile teams to participate in a number of meetings on both a daily and weekly basis. The length of time for these meetings can vary from 10 minutes (daily stand-up) to 3 hours (iteration planning). These are viewed by some team members as de-motivating and disruptive to the day and reduce the amount of time available to work on the deliverables required for the next day causing some frustration. For

example, "*the more meetings you have, the more work you get and the less time you have to do it" [Developer, IRE]"*. This is particularly de-motivating when individuals "*feel under pressure [Developer2, IRE]*" to make progress, even though this is sometimes outside of their control, for example, waiting on a decision from the customer.

Use of the agile practices on a long-term project

Over time the impact of the agile practices may diminish on a long-term project e.g. > 2 years, particularly where the team composition is relatively stable throughout the project. The daily stand-up may become routine with less interaction amongst team members. This may be due to an increase in their level of experience and team members may feel that less feedback/participation is required. This is evident in the IRE team where daily stand-up meetings have been in use for over two years and the feeling from one developer, who was one of the first members of the team, is that "*some guys just aren't switched on as much… and that they are tired of going into this meeting every day [Developer1, IRE]*". The daily stand-up was called "*tedious or a bit of a chore [Developer3, IRE]*" and the value of the daily stand-up and the retrospective were questioned by a number of individuals with one team member feeling that sometimes they are "*saying the same thing as yesterday and you wonder if anyone notices [Developer3, IRE]*". While the daily stand-up was still considered important by this team it seems to have lost its momentum and become 'stale' and as a result could be detrimental to the motivation of the team. This may be due to the fact that the team is working on a long-term project and team members are meeting daily to discuss the same project. The composition of the team has changed intermittently since the inception of the project, but a number of experienced individuals have worked on the project since the outset. If these team members become de-motivated it may be difficult for newer team members to continue to be motivated by these practices.

Complex or fragmented tasks

A number of individuals detailed that it can be frustrating for individuals to be in a position where they have to report a lack of progress on a task in the daily stand-up or where there appears to be a lack of progress. For example, it can be difficult to capture some effort in a task such as "*trying to analyse a problem for one day… and there may be no [tangible] outcome [Developer, ABB]*". Complex and more long-term tasks were highlighted as a de-motivator by a number of developers in ABB. On their current project it is not uncommon to be allocated a complex task in the planning meeting that requires some research, which has proven very difficult to estimate and "*you really don't know how much time it will take you [Developer, ABB]*". It can result in the lack of completion of the tasks for the iteration and "*it's de-motivating [Developer, ABB]*" for the person responsible to report on this in the daily stand-up or in the iteration retrospective.

De- Motivators in Software Engineering	Iteration Planning	Daily Stand-Up	Iteration Retrospective
D2. Stress		x	x
NEW: Frequency of meetings	x	x	x
NEW: Use of the agile practices on a long-term project		x	
NEW: Complex and fragmented tasks	x	x	x

Table 4. Impact of Agile Practices on De-Motivation

DISCUSSION AND CONCLUSION

This research sought to understand how the use of agile practices contributes to team motivation or de-motivation. The results show that the iteration planning meeting, daily stand-up and iteration retrospective can both motivate and

de-motivate an ASD team. A number of new motivating and de-motivating factors were identified as a result of using these agile practices.

The use of the agile practices encouraged greater interaction, feedback, support and communication between both teams. While this was seen as a positive, team members were not necessarily comfortable with the increase in communication. Their tasks and progress made on tasks became visible to all other team members, which resulted in team members putting pressure on themselves to deliver on what was promised as they felt accountable to the team. This may be positive from a management perspective as tasks may be completed more quickly. Conversely, this may place team members under continuous undue pressure, resulting in de-motivation. Managers must ensure that team members are not experiencing unnecessary stress and must work with the team to make sure that tasks are allocated appropriately and that sufficient supports are in place if required.

The personalities of team members differed with some individuals tending to be more introverted than others. The agile practices have motivated individuals to freely voice their opinions and share information, which has resulted in the development of strong relationships among team members. Team members have become more familiar with each others abilities and competencies. They also feel more comfortable asking for help and they seek help as soon as they need it. This positive work practice has emerged as a result of the agile practices.

While the two teams studied were located in different countries their culture does not appear to visibly identify any differing motivational factors between the two teams. There were some differences between the two teams, but these related more to how the practice was implemented rather than a cultural difference. Prior research has determined that software developers and software development teams are considered a distinct group of individuals (Couger, 1988; Couger and Zawacki, 1980), which may imply that these findings relate to software developers and software development teams irrespective of their organizational setting or culture.

From a management perspective this study highlights to managers how these practices can also cause some frustration and apprehension amongst team members and it is important than managers are aware of these so that they can be avoided or addressed where possible. ASD teams must be clear on the goals and benefits of each agile practice and if they are causing difficulties amongst team members then team must take control, agree to review and change the way the practices are implemented. For example, if the daily standup is considered disruptive to the day then the team should collectively agree on a time that is most suitable for all parties that minimizes the impact on the team. Likewise, if a team feels that an agile practice is no longer productive then the team needs to work together to understand why that is happening and with a view to resolving and implementing a solution to address the problem, so that the agile practice can continue to be effective.

Limitations and Future Research

This research is limited by virtue of the fact that only two ASD teams were studied. The findings are therefore, only representative of these teams. A second limitation relates to the number of practices studied as this research only focused on three agile practices. A third limitation relates to the composition of the team. Even though an agile methodology has only been recently implemented in one team, both teams were well established and familiar with each other. The findings may be different with a new team that has no prior experience working with each other. Future research should examine these and other agile practices across a variety of teams and cultures to determine if there other impacts on team (de)motivation. Additional research should examine how these and other agile practices may further impact agile teams, the relationships of team members or affect project outcomes.

ACKNOWLEDGMENTS

APPENDIX

This appendix details an excerpt of the interview protocol.

Excerpt of the interview protocol

How long have you been part of this team?
How long has this project team been working together?
Has the team changed since the start of the project?

……..

Do you feel part of the team?
Why/why not?
How has the iteration planning helped you to feel part of the team?
How has the daily stand-up helped you to feel part of the team?
How has the iteration retrospective helped you to feel part of the team?

………
To what extent does the iteration planning motivate the project team?
[*Prompts: opportunity to tackle new problems, opportunity to increase knowledge and skills, planning for a short timeframe*]

To what extent does the daily stand-up motivate the project team?
[*Prompts: requirement to provide an updates at daily stand-up meetings, perception that progression must be made, desire to complete tasks on time, deadlines are immediate, praise and support from each other, sense of personal satisfaction, increase my feelings of self-esteem*]

To what extent does the iteration retrospective motivate the project team?
[*Prompts: recognition received from other team members for work done, feeling of accomplishment, contribution to personal growth and development,*]

To what extent does the iteration planning de-motivate the project team?
[*Prompts: iterations too short, lack of long-term planning in comparison to Waterfall approach, lack of input from the customer*]

To what extent does the daily stand-up de-motivate the project team?
[*Prompts: dislike asking for help, dislike reporting lack of progress at daily meetings, constant feeling that must deliver, constant monitoring of work, too many distractions with meetings and other unplanned tasks, lack of down-time, lack of input from the customer*]

To what extent does the iteration retrospective de-motivate the project team?
[*Prompts: lack of action, lack of customer feedback, no recognition for work completed*]

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