

Enablers and barriers to customer involvement in agile software projects in the Norwegian software industry: The Supplier's perspective

Lubna Siddique; Bassam Hussein

Abstract

The purpose of this study is to present the research findings of factors that contribute to making customer involvement work effectively in an agile software project and to explore factors that can provide a hindrance to customer involvement. We conducted 24 interviews with practitioners working with agile software projects in Norwegian software industry. Grounded theory was used to analyze the data. Findings suggested a list of factors that can enhance customer involvement and make it more effective. We called these factors enablers to customer involvement. The factors that suppliers use for effective customer involvement are understanding customer's perception of success, effective communication, being forthcoming and accommodating, transparency and openness and establishing trust. Factors that suppliers think the customer should pay special attention to are: customer attention, product owner who understands the business, good understanding of technical and functional side and persistent cooperation. This study also presents factors that can hinder customer involvement, thus making the customer-supplier relationship less effective. We called these barrier factors. These are not getting enough customer time, lack of understanding on the customer's part, people without right skills and lack of communication.

The research was carried out in the Norwegian software industry and grounded theory was used for data analysis, therefore this research can be called context-specific. Research participants interviewed were project managers, therefore this study presents project managers' viewpoints only. Another limitation is that most of the participants were from the supplier side. This study provides a theory/framework of enablers and barriers to customer involvement in agile software projects. Practitioners can use these factors to enhance customer involvement in agile projects.

Keywords: agile methods, customer involvement, grounded theory, communication, frequent delivery, agile projects.

1 Introduction

A customer is someone who "has a direct interest in the project. He/she might be a direct user of the system, a representative from the customer organization or a domain expert in developer organization" (Mohammadi *et al.*, 2009). Real customer involvement means "the direct involvement of end-users and other business stakeholders on the project" (Martin *et al.*, 2009). In traditional approaches, the interaction between customer and supplier or team is limited to the planning phase and providing feedback about the end product (Grisham and Perry, 2005; Judy and

Krumins-Beens, 2008; Nerur *et al.*, 2005). Because of its importance, customer involvement is suggested to be an important success factor in an agile project. With the introduction of the agile manifesto, customer involvement is emphasized much more than it was in traditional approaches (Fowler and Highsmith, 2001). Among four agile values, one is:

“Customer collaboration, over contract negotiation” (Beck *et al.*, 2001). Agile methodology “was meant to facilitate closer collaboration with the customer by encouraging changes throughout the project, in order to better support the customer needs” (Henriksen, 2016).

According to Serrador and Pinto (2015), agile methods “depend upon early and continuous customer involvement, both in establishing goals for the project and providing feedback to progressive prototypes as the project moves through its life cycle”. This close cooperation with the customer helps “re-scoping “project requirements in light of new information or customer requests” (Serrador and Pinto, 2015).

Involving the customer means working in close collaboration with them. Since the customer is the main focus in agile projects agile methodologies, therefore, stand on the principles of “improved customer satisfaction, adapting to changing requirements, frequently delivering working software, and close collaboration of business people and developers” (Paetsch *et al.*, 2003).

Customer involvement is suggested to a success factor in an agile project (Dybå and Dingsøyr, 2008, Highsmith and Fowler, 2001, Martin *et al.*, 2004, Misra, *et al.*, 2009, Nerur *et al.*, 2005). According to Nerur *et al.* (2005), “The success of agile development hinges on finding customers who will actively participate in the development process.” This customer relationship, in turn, builds on “commitment, knowledge, proximity, trust, respect” (Nerur *et al.*, 2005). Different studies were conducted to establish the link between customer-related issues and involvement (Lindvall *et al.*, 2002; Chow and Cao, 2008; Hoda *et al.*, 2011).

The need for more theory-based, empirical studies has been identified by various studies (Hannay *et al.*, 2007; Herbsleb and Mockus, 2003; Sjøberg *et al.*, 2007). The need for empirical studies in relation to agile methods and agile project management is also evident by following studies (Abrahamsson, *et. al.*, 2009; Dybå and Dingsøyr, 2008; Suetin *et al.*, 2016; Vidgen and Wang, 2009). This study attempts to fill this gap by conducting empirical research. In addition, despite its importance, a systematic inquiry into the conditions that enable the achievement of an adequate level of customer involvement has been limited to date. This paper aims to fill this gap and it aims to identify the key barriers and enablers for achieving an adequate level of customer involvement. This paper will also explore some of the related theoretical concepts, such as participation and engagement. All of the studies that have been conducted so far have focused solely on the importance of customer involvement. To the best of our knowledge, no study has examined the factors that enable or which hinder customer involvement in the Norwegian software industry. Thus this research addresses the need for further empirical studies in software engineering.

The rest of this paper is structured as follows. Section 1 presents the literature review. In this section related concepts of customer participation, customer engagement and customer involvement is presented along with the importance of customer involvement. The level of customer involvement required for agile projects is also presented. Section 2 presents the methodology. Section 3 will present the results. Section 4 will present the discussion. Finally, Section 5 presents the contributions and limitations of this research.

2 Literature Review

2.1 Customer involvement

Customer participation refers to physical, emotional and informational (mental) input (Rodie and Kleine, 2000). Meanwhile, customer involvement refers to “customer behaviors related to the definition, production, and delivery of a service, including mental, emotional, and physical behaviors” (Cuiling). Customer involvement means that the customer participates in all phases of the project development and works in close collaboration with the supplier.

Customer participation has three dimensions (Silpakit and Fisk, 1985), these are mental, physical and emotional effort and involvement. According to Kelley *et al.* (1990), customer participation has two dimensions, these are technical-quality (customer behavior) and functional-quality (interaction between customer and employee). Maru File *et al.* (1992) found that the participation factors included tangibility, empathy, attendance at meetings, and meaningful interaction.

Customer engagement is “a psychological state that is characterized by a degree of vigor, dedication, absorption, and interaction” (Zheng *et al.*, 2015). Customer engagement is defined as the supplier’s effort to make a connection with the customer so that they can listen to their needs and expectations from the project. Improved quality and customer satisfaction can be achieved through increased customer participation (Cermak *et al.*, 1994).

True customer engagement involves (Schmidt, 2011)

- *enabling contact*
- *understanding a customer’s context*
- *providing rich and relevant content*
- *providing convenience, and, last but not least*
- *communication with the customer, online and offline across all customer touchpoints*

The concept of a dedicated customer means that the customer is committed to participating in the project when and wherever needed. Commitment from the customer means that they involve themselves more in the project, and they dedicate more time and energy to give feedback about the deliverables, resulting in a more positive effect for the suppliers (Bartolo, 2012). Customer involvement cannot be ensured unless customers are committed to being part of the whole software development process.

Chow and Cao (2008), Lindsjörn *et al.* (2016) and Vithana *et al.* (2015) argue that customer involvement to be one of the success factors in agile projects. Misra *et al.* (2009) hypothesized 12 success factors based on the literature and conducted a survey to find evidence of their validity. They found that among the 12 hypothesized success factors, five are found to be most relevant. Among them are customer-centric issues. The criticality of customer involvement is also shown by the CHAOS report (Standish Group Report, 2015). According to this report, the customer plays the most vital role in project success, while the absence of customer involvement is shown to be a reason for projects running into problems. Real customer involvement means “the direct involvement of end-users and other business stakeholders on the project” (Martin *et al.*, 2009).

Tanner and Willingham (2014) performed a case study research regarding the factors that can result in the success or failure of a project. They used the same five categories used by Chow and Cao (2008) and they have shown that stakeholder involvement and buy-in were among the most important success factors. By engaging customers in the development process, suppliers are focused and committed to providing the customer with a useful product that

will give the customer tangible results and increased business value. When the customer gets developed functionality, then they will ultimately become more involved in the project.

Involving the customer in the early stages helps the supplier to learn about customer value (Dingsøyr and Lassenius, 2016), which in turn helps to develop a product that will deliver certain benefits to the customer. Instead of focusing on delivering functionality that will never be used, the shift is to supply a product that will instead deliver business value. Rather than focusing on delivering functionality, the focus will be on delivering business value. The recent increasing trend is towards a Lean startup, which focuses on delivering value by reducing waste (Ries, 2011).

Customer satisfaction is also a success criterion (Misra *et al.*, 2009; Siddique and Hussein, 2016b). This can be achieved if the customers are kept involved in the whole development cycle. When the customer is involved in defining deliverables, increased collaboration and the active involvement of the customer will make them feel more in control of the project. This results in increased customer satisfaction (Koch, 2005). Customer involvement can ensure quality deliverables that can further ensure customer satisfaction at the end of the project. According to Wicks and Roethlein (2009), “the summation of the affective evaluations by each customer of each attitude object that creates customer satisfaction”. They suggest that customer satisfaction is an important part of quality. Customer/user satisfaction is ranked third after on-time delivery and product quality by the 9th Annual State of Agile survey (VersionOne, 2015).

The supplier should put effort into finding out the where and how of involving the customer in the project. Due to the agile philosophy of close customer collaboration, the customer should be part of the project planning meetings, sprint planning and reviews meeting, and sprint retrospectives. This can offer an important platform for customer involvement and information can be gathered and shared among the people of the organization (Boehm and Turner, 2003).

One of the comprehensive studies about the lack of customer involvement was conducted by Hoda *et al.* (2011). They studied lack of customer involvement in agile software projects and found that the reasons for lack of customer involvement are “skepticism and hype, the distance factor, lack of time commitment, dealing with large customers, fixed-bid contracts, and ineffective customer representatives.” Their study also presented the consequences of inadequate customer involvement which are “pressure to over-commit, problems in gathering and clarifying requirements, problems in prioritizing requirements, problems in securing feedback, loss of productivity, business loss”. This study also presented the undercover strategies which agile teams were using to make this involvement work optimally. These are “changing customers’ mindsets, providing options, buffering, changing priority, risk assessment up-front, story owners, customer proxy, just demos, E-collaboration, and extreme undercover. The present study is built on same underlying theme as conducted by Hoda *et al.* (2011) but in different contexts (Norwegian software industry) and with different participants.

3 Methodology

The research method we choose for our research is Grounded theory because this theory helps to understand the phenomenon taking place in the current scenario (Glaser, 1992) (Glaser and Strauss, 1967).

The reasons for using grounded theory for this research are as follows:

1. Grounded theory is a suitable approach for underexplored areas (Birks and Mills, 2011). Although considerable research has been done regarding the importance of customer involvement in agile projects, very little research has been done to identify enablers and barriers to customer involvement.
2. The findings are based on qualitative data collected from project managers who have several years of experience with software projects in general, and agile software projects in particular; therefore, the Grounded theory is a suitable approach for this study (Marshall and Rossman, 2014).

3.1 Data collection

We conducted 24 interviews with practitioners working with agile methods in software organizations in Norway.

Table 1: Participants Profile

Practitioners	Current designation	Agile methods worked with	No. of years' Experience with agile methodologies
AP1	Project manager	Scrum, KANBAN	10
AP2	Project manager	Scrum, KANBAN	9
AP3	Project manager	XP, Scrum	9
AP4	Project manager	XP, Scrum, KANBAN	10
AP5	Project manager	Scrum, KANBAN	8
AP6	Project manager	Scrum, KANBAN	8
AP7	Project manager	XP, Scrum	10
AP8	Project manager	Scrum, KANBAN	10
AP9	Project manager	Scrum	9
AP10	Project manager	Scrum	8
AP11	Project manager	Scrum	8
AP12	Project manager	XP, Scrum	10
AP13	Project manager	Scrum, KANBAN	10
AP14	Project manager	Scrum, KANBAN	9
AP15	Project manager	XP, Scrum	10
AP16	Project manager	XP, Scrum, KANBAN	12
AP17	Project manager	Scrum, KANBAN	8
AP18	Project manager	Scrum	7
AP19	Project manager	Scrum, KANBAN	8
AP20	Project manager	XP, Scrum	9
AP21	Project manager	Scrum, KANBAN	8

AP22	Project manager	XP, Scrum	10
AP23	Project manager	XP, Scrum	9
AP24	Project manager	XP, Scrum, KANBAN	11

These include organizations that perform in-house development and consulting organizations that deliver projects to customers. The practitioners we interviewed had many years of experience within IT and of using agile methods. We conducted semi-structured interviews through various media, including face to face (mostly) and Skype. Twenty-four interviewees were selected based on the following criteria: (1) role (project manager); (2) number of years of experience in software project management; (3) work experience and knowledge related to agile development. The sampling technique we used for our study is called non-probability sampling (Advice, 2000). Taking into account its suitability for the research, we used purposive sampling. Deliberate contact was made with the participants who had relevant experience with agile projects. We performed an Internet search for the practitioners and after establishing their suitability through our research question, we requested them to participate in the study. We assured participants that their anonymity would be maintained. We refer to practitioners as AP1–AP24. Practitioners' profiles are given in Table 1. Semi-structured interviews were conducted of about 30–60 minutes duration.

3.2 Data analysis

In Grounded theory, data analysis is called coding. Coding, using a systematic approach of data analysis, helps in understanding the data (Corbin and Strauss, 1990). Coding is the analysis of data to gain meaningful insight from the data (Corbin and Strauss, 1990). Data analysis in Grounded theory is a continuous process and starts very early after conducting the first interview (Corbin and Strauss, 1990). Figure 1 and Figure 2 present the coding process.

3.2.1 Open coding

Open coding is the first step of data analysis in Grounded theory (Glaser 1978). All possibilities of data interpretation are considered and taken into account at this step. After finding key points in the data, a suitable code is assigned to it. Codes are assigned by making sure that these fit the underlying concept of the data (Glaser, 1978).

3.2.2 Constant comparison

Each of the emerging codes in open coding was compared to find the similarities and differences with the previous developed code within the same interview transcript and with other transcripts to produce a higher level of abstraction called concepts. This method was again performed on concepts to produce a higher level of abstraction called category (Allan, 2003). This is called the constant comparison method (Glaser, 1967).

3.2.3 Core category

Open coding is ended with the identification of a core category (Murphy *et al.*, 1974). A core category is a category that is central and related to several other categories. A core category “accounts for a large portion of the variation in a pattern of behavior”, therefore it indicates the “main concern or problem” for the participants (Glaser, 1978). It is the main concern of

participants that becomes the research question. The core category should be central and interlinked with several other categories. The category that we found possessed all these properties was “customer involvement”. In one study there is a possibility of more than one core category emerging. In this case, each core category must be addressed in separate studies. Figure 1, Figure 2 and Figure 3 present the example of coding done for this study.

3.2.4 Selective coding

During selective coding “only those variables [concepts or categories] that relate to the core variable [category] insufficiently significant ways as to produce a parsimonious theory” are considered (Glaser, 1978, 2004). We started coding around the selected core category i.e. customer involvement. Interview transcripts that were related to customer involvement were examined carefully to find the relevant categories.

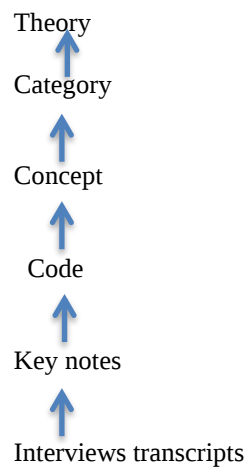


Figure 1. Levels of abstraction in Grounded theory

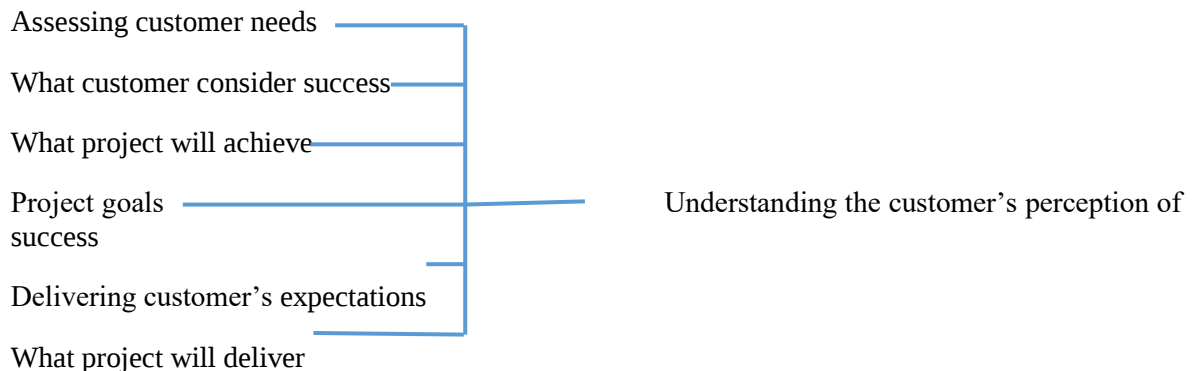


Figure 2: Example of generation of concept from codes

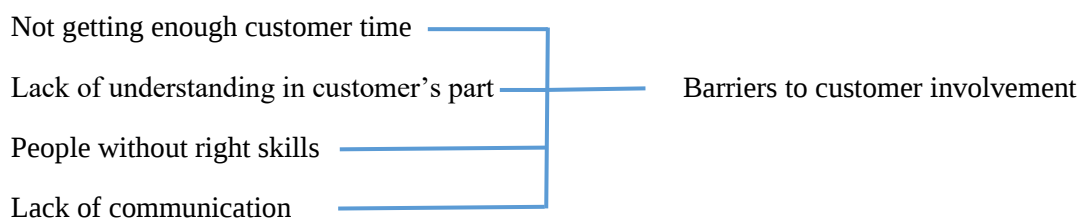


Figure 3: Example of generation of category from concepts

3.2.5 Theoretical saturation

The researcher must stop coding and data collection when theoretical saturation is reached. This means when analysis of collected data no longer provides any new insight or categories (Glaser, 1992). We stopped data collection when we felt that no new categories were emerging.

3.2.6 Memos

During the process of coding, researchers are encouraged to write down their own ideas about the category. These ideas are called memos. These memos are an important part of Grounded theory research and are used for reporting results of the data.

4 Findings

Results from the interview data are discussed in the following section (Please see Table 2).

Table 2: Enablers and barriers in customer involvement

	Enablers	Barriers
These are the factors that suppliers pointed out that they spend time on to create effective customer involvement	Understanding the customer's perception of success Effective communication Being forthcoming and accommodating Transparency and openness Establishing trust	Not getting enough customer time Lack of understanding of customer's part People without the right skills Lack of communication
This is a list of factors that suppliers expect the customer must do to make involvement optimal	Customer attention A product owner who understands business Good understanding of the technical and functional side Persistent cooperation	

4.1 Enablers

Factors that can enhance customer cooperation include: understanding the customer's perception of success, effective communication, being forthcoming and accommodating, transparency and openness, establishing trust.

4.1.1 Understanding the customer's perception of success

Practitioners asserted that the first step to ensure customer involvement and thereafter successful agile project delivery is to understand the customer's perception of success. For this, the project manager must be able to assess what are the customer's needs and what the customer considers as a success.

"The project manager needs to be very good at controlling the project and controlling the development and first and foremost understanding customer needs." __AP9

The practitioner told us that although finding out what the customer really needs is hard, one way they use to figure it out is by talking with them.

“Success is very relevant to the customer understanding what they need. It’s really difficult to understand what they really need. They always ask for something else, so we need to hear them and we need to talk together.” __AP13

“I always have at the top ‘the goals’ of what the project has to achieve. What we are supposed to deliver and by what time. I always like to have clear the customer’s goals (requirements) and what they want from us.” __AP8

“Managing customer expectations and match their quality (desired). Quality is the delivery of expectations. If we are delivering as much as they expected then you are good. I think expectation management is really key to being able to achieve success from both parties’ perspectives.” __AP14

4.1.2 Effective communication

Practitioners believe that a project is not about one person, instead it is a joint effort of all the stakeholders whose benefits are linked with the outcomes of the project. Therefore, there is a strong need for effective communication between all the stakeholders in general, and between customer and supplier in particular. Practitioners believe that communication channels should be open and direct to avoid any kind of ambiguities. Involving customers more closely and by creating direct communication with them is necessary for ensuring successful project delivery.

“Communication is everything to have success.” __AP10

“The most important success factor is communication and trust.” __AP11

Practitioners asserted that in order to ensure successful delivery of a project, open communication channels should be present with all the positive and negative feedback for improvement.

“Remain completely open to communication and feedback.” __AP15.

“Communication between customer and supplier and between the team, especially with the product owner.” __AP6

“Direct communication is very important because you agree on a project’s visibility instead of writing reports. Also important thing is to show software to the customer and get feedback.” __AP23

4.1.3 Being forthcoming and accommodating

Practitioners asserted that one way to ensure customer involvement is the supplier being forthcoming in accommodating customer requirements whenever possible. This is ensured by managing customer requirements. They believe that the key to success is delivering and managing customer expectations so that the end product is according to the requirements specified by the customer.

“Managing change requests (from the customer) is a major success factor.” __AP1

“Managing to make and deliver the required functionality (requested by the customer).” __AP2

“In this project, it is kind of hard to say because requirements here are so strict and fixed – the success here will be to deliver all the requirements and how we can meet them. We somehow need to make sure that we are able to fulfill the customer’s requirements.” __AP7

4.1.4 Transparency and openness

Transparency and openness can be ensured by making sure that the project-related deliverables are open and accessible to the customer. Practitioners believe that frequent delivery is also important for involving the customer and ensuring success in agile software projects. Instead of delivering a complete project once, agile methods provide the option for delivering in iterations. This helps to provide better insight into the customer, thus ultimately a better working atmosphere with a lot of trust between supplier and customer. The customer receives the functional parts of the project and tests its functionality. This helps them to understand and track the progress of the project. Unlike traditional projects where the entire project is delivered at once, agile methods provide more insight and better decision-making to the customer by delivering often. The customer can decide whether the delivered part of the project is fully functional and according to specifications, or point out if any changes are required. This also helps to create trust between both customers and suppliers.

“I think you should deliver as often as you can. Show customers what you have made, and make delivery as early as possible.” __ AP15

“Make the product visible to the customer as often as possible” __ AP20

4.1.5 Establishing trust

Practitioners believe that trust plays a vital role when it comes to establishing a long-term relationship with the customer. The only way a customer can assess the supplier's performance is through deliverables, therefore practitioners believe that delivering quite often and in accordance with commitments can help to build trust between both parties.

“Establishing trust with the customer by delivering on time and by showing that if you are delayed you will do overtime to meet the deadline.” __ AP1

“Maybe the most important success factor is communication and trust. The more trust there is fewer overheads and waste reporting. If you have a fair amount of trust and a good relationship with the client you can speak openly.” __ AP11

“A high level of trust between the client and the vendor.” __ AP22

4.2 Supplier's expectations of the customer

In this section, we will present what the supplier expects the customer to be able to do so that customer involvement is optimal for successful deliveries. These are customer attention; a product owner who understands the business; a good understanding of technical and functional side; and persistent cooperation.

4.2.1 Customer attention

Practitioners believe that customer attention is very necessary for success in agile software projects. Without the customer's attention, the supplier cannot deliver the project in the manner in which it was supposed to be delivered.

According to practitioners ensuring that the customer is giving enough time to the project is one of the foremost factors for success. Lack of customer attention and “not getting enough customer time” can affect project success.

“The most crucial factor is constant attention from the customer.” __ AP3

“The most important success factor is customer involvement.” __ AP12

“If the client involves himself, then it is an investment.” __AP12

“Customer involvement... I feel strongly that the more the better.” __AP13

AP16 asserted that not getting customer time can affect the project success, therefore the customer must ensure their presence in order to achieve a successful project.’

“Getting customer involvement is a success factor in agile projects.” __AP4

“Customer involvement in terms of both time and dedicated customer.” __AP22

4.2.2 Product owner who understands the role

Usually, the customer is represented by a product owner. Therefore the product owner must ensure to involve him in the project in order to ensure that the project works smoothly. According to respondents, sometimes the product owner is involved in many other job-related tasks, therefore he/she cannot give enough time to the project resulting in delays on the part of the supplier.

“The product owner knowing his or her role and having the product vision to motivate teams to go forward.” __AP 12

4.2.3 Good understanding of the technical and functional side

Respondents asserted that the customer should have a good understanding of the technical and functional side of the business. The problem arises when customers are working with agile for the first time and they don’t have any idea how it works and what project deliverables will look like.

“I think the initial problem is that we expect customers to be agile as well. We want them to know how scrum and lean works. But it often looks like that we put too much faith in their abilities especially when they haven’t really worked agile before. They have their participating mindset about how to define the processes, so we are quite far apart with regards to our understanding of how to work in this situation.” __AP24

4.2.4 Persistent cooperation

To deliver a successful project, constant collaboration and cooperation is a must. Respondents asserted that persistent cooperation between supplier and customer should be ensured in order for agile projects to work smoothly.

“Cooperation might be an issue. It can be a problem to get that (expected) level of cooperation from some customers. If they (customers) want to do an agile project they have to get involved a lot.” __AP17

“The customer is willing to pay but has a problem in understanding that how important is their involvement during the process.” __AP3

5 Barriers

Interview analysis gave the following factors that can act as barriers to involving customers in agile software projects. i.e. not getting enough customer time; lack of understanding on the customer’s part; people without the right skills; lack of communication.

5.1 Not getting enough customer time

Practitioners believe that it is challenging to manage an agile project without the active participation of customers. Therefore, one of the barriers could be a lack of customer attention or not getting enough customer time.

“Customers don’t understand how important it is to be a part of the project.” __AP3

“The key thing that affects agile projects are not getting enough customer time.” __AP16

“I think the key things that can affect agile projects are not getting enough customer time. That’s a big issue.” __AP18

One respondent told his experience of an unsuccessful project and one of the things that had a major impact was that the customer didn’t involve themselves enough in the project

Practitioners asserted that sometimes customers don’t understand how important their involvement in the project. One of the practitioners had experienced the failure of a big project. According to him, the reason was as follows:

“An external project manager was hired on this project and the lesson learned was that this external project manager probably didn’t understand the Scrum method well enough. The product owner was also hired. The customer never got deeply enough involved in the project. It is very important to define in the contract that customer involvement is important, and so is their feedback.” __AP3

5.2 Lack of understanding of the customer’s part

Practitioners asserted that customers don’t involve themselves in the project because they don’t have an understanding of how agile methods work.

“Customers often don’t understand the technological side of the product. The result is that making developers and the customer talk to each other takes a huge amount of time. The customer wants to talk with someone who is very good at communication, so there needs to be a middleman who understands the technical and functional side of the project. I feel that’s best.” __AP9

5.3 People without the right skills

According to practitioners, if the product owner and project manager are not equipped with the right skills the project may suffer in the long run.

“If any of the organizations involved in the project do not accept the way agile works, there is a risk that the people involved haven’t got the right skills – I’m thinking in terms of technical or soft skills. If you have a technical person who cannot speak to people, then it’s not likely to work very well.” __AP18

One of the problems practitioners face is that the product owner is not the decision-maker. Due to this, he/she doesn’t feel responsible for taking decisions regarding the project and product.

“Another problem is that if you represent a customer and you are asked for some suggestion regarding the product you feel very responsible. Then, if you have to take the decision regarding the product then perhaps you think that I am taking this decision but if no one likes

this, I will be blamed. One thing is that you (customer side) have to delegate authority to people (customer's representative) in such a way that they have to make decisions." __AP17

"We were having people from the customer side when it comes to making decisions and they have problems in deciding. They have to discuss things first" __AP17

Another thing is that if a project manager is not equipped with the right skills it will become difficult to deliver a successful project.

"If the project manager doesn't know about scrum, he/she can't deliver a successful project." __AP21

5.4 Lack of communication

Practitioners believe that a lack of effective communication could be the major barrier to creating an effective communication channel, thus affecting customer involvement and ultimately the project's success.

"I see the single point of failure is lack of communication." __AP11

One practitioner who experienced the failure of the big projects told us that one of the lessons learned is that the customer should have created an effective communication channel.

"The success factor that the customer should have used was to involve all these parties more closely and to create more direct communication...because that's not case now." __AP7

6 Discussion

Agile methods place more emphasis on people, the communication between them and customer priorities (Beck *et al.*, 2001). Therefore, Agile projects require motivated and competent individuals (Fowler and Highsmith, 2001; Smith and King, 2008). The competency of the project manager, the product owner, as well as the team, is very important. Findings suggested that understanding customer perception success is an enabler for customer involvement. The project manager is responsible for managing the stakeholder's expectations. Therefore, the project manager must be competent enough to understand customer's needs, expectations and deliver them accordingly. Therefore, Ambler (2008) suggests that the supplier should work in close cooperation with the customer because this will help them to understand their customer's needs. The project manager needs to be equipped with technical and project management capabilities (Siddique and Hussein, 2016c). Our findings have also suggested that ensuring customer involvement requires the suppliers to be forthcoming in accommodating customer requirements whenever possible.

Findings also suggested that competent individuals are important for successful agile delivery. A team with the right skills is essential to meet the project's scope, time deadlines and to improve customer interactions (Lindvall *et al.*, 2002). The agile team should be flexible and collaborative (Nerur *et al.*, 2005; Agile Alliance, 2001) and individuals should be able to share knowledge and expertise (Schwaber and Beedle, 2002; Cockburn and Highsmith, 2001). Along with the team, the product owner is also required to be competent and actively involved in the project. People working with agile are required to be more responsive, work in collaboration and be quick in responding to changes (Lindvall *et al.*, 2002). According to Boehm and Turner (2004), the customer representative (product owner) should use the CRACK (Collaborative, Representative, Authorised, Committed, and Knowledgeable). Hoda *et al.* (2013) presented that how different roles in an agile team are "effectively managing customer expectations and coordinating customer collaboration,

securing and sustaining senior management support, and identifying and removing team members threatening the self-organizing ability of the team.” Adaption of agile practices for small teams is studied by Babb *et al.* (2014a). The need for learning teams is also recognized by Babb *et al.* (2014) who suggests that “teams, their management, and customers must all recognize the importance of creating learning teams”. Babb *et al.* (2014b) presented the “Reflective Agile Learning Model (REALM), showing where and how to integrate reflective practice in agile software development” to improve team’s performance. We have also found that communication is another enabler in agile projects. The reasons for project failures could be technical, as well as being caused by the lack of (effective) communication (Eckstein, 2013) and unaligned teams (Bloch *et al.*, 2011). Effective communication is required in agile teams, and between customer and supplier, and it is considered to be an important factor for success in agile projects (Fowler and Highsmith, 2001; Cockburn and Highsmith, 2001; Lindvall *et al.*, 2002; Beck, 2000). Face to face communication is the most effective form of communication (Korkala *et al.*, 2009). In fact, the effectiveness of communication is more important than the frequency of communication (van Kelle, 2015). Misunderstanding and lack of communication are suggested to be the main factors that can make a project fail (Cockburn and Highsmith, 2001; Lindvall *et al.*, 2002). Therefore, openness and direct communication are important for the success of agile projects (Kajko-Mattsson *et al.*, 2010; Cottmeyer, 2008; Sutherland *et al.*, 2008). Communication also helps to increase information sharing and helps in further increasing the level of collaboration (Ahimbisibwe *et al.*, 2015) both within the team as well as between the customer and supplier. To deliver a successful project, the collaboration between team members as well as with the customer plays a vital role. Our findings regarding effective communication and cooperation and collaboration are in agreement with the previous literature.

This study has suggested that trust is another important enabler. Establishing a trust relationship is important (Moe *et al.*, 2010). Organizations should focus on building trust among team members (Nerur *et al.* 2005) as well as with the customer. Building trust between customer and supplier is difficult, and it requires a great amount of effort and time (Siddique and Hussien, 2016). Carmel (1999) argues that “trust needs touch”. Effective and frequent means of communication have been suggested to help in building trust (Moe and Smite, 2007) and in building rapport among team members (Shrivastava, 2010) and with the customer (McHugh *et al.*, 2012; Lee and Yong, 2010).

Keeping the “lines of communication open” along with “knowledge sharing, transparency and feedback” also helps to build trust (McHugh *et al.* 2012). Effective communication also helps to create interpersonal relationships between all of the team members and the customer (Turner and Müller, 2005; Eckstein, 2013). Working in closer collaboration with the customer (Beck *et al.*, 2001) also helps to create trust between the parties involved in the project. Our findings regarding trust and the factors that create trust are in agreement with the previous literature.

Lack of trust was found to be one of the reasons why customers do not involve themselves in the project implementation (Korkala *et al.*, 2009). Lack of trust could be the result of “ineffective communication particularly during the daily meetings and demo for customers” (Dorairaj *et al.*, 2012). Other factors that contribute to lack of trust in projects include “reduction of and unpredictability in communication; and a lack of face-to-face meetings” (Moe and Šmite, 2008). Lack of trust can decrease productivity and quality along with “decreased information exchange and feedback” (Moe and Smite, 2007). Other

consequences of lack of trust found in the study by Dorairaj *et al.* (2012) include lack of commitment and ineffective collaboration.

Increased communication helps to build trust which in turn helps to increase customer involvement. “Regular participation and interaction by the customer” would be beneficial for the team and “increase trust between the parties” (McHugh *et al.*, 2012).

The findings of this study suggested that ensuring openness and transparency can act as an enabler to customer involvement because delivering working parts of the project to the customer also helps to foster a trust relationship between both parties, which in turn acts as an enabler for customer involvement. Frequent delivery can help towards having openness and transparency in the customer and supplier relationship, and can also help to create trust in the long term. Frequent delivery provides more visibility of the project deliverables (Bartolo, 2012; Siddique and Hussein, 2016a). Our interview findings suggest that delivering working parts of the project to the customer helps to foster a trusting relationship between both parties. The supplier provides deliveries in the form of iterations and the customer will check the deliverables for quality and against requirements specifications (Cohn, 2010). This will promote shared decision making along with the sharing of responsibility, which will help to avoid the blame game at the end of the project. Continuous deliveries further enhance the level of cooperation between the supplier and customer. The customer can have working parts of the project delivered after each iteration (Nerur *et al.*, 2005), thus agile methodologies help to keep better control of the project.

Another benefit of frequent delivery is that the customer can prioritize the iterations, suggest changes (even late in the process) and can give positive/negative feedback about the product. Thus, the quality of the deliverables and the business value of the product remain the focus of the project (Waters, 2007) and the customer can adjust the iterations based on the business value (Siddique and Hussein, 2016). The customer can contribute to creative ideas (Nishikawa *et al.* 2013) that can improve product variety and product performance (Lau *et al.*, 2010). These activities help to earn ownership, which in turn provides more motivation for increased involvement in the project along with positive suggestions for improvement in the project (Bartolo, 2012). Thus, continuous delivery provides benefits of increased visibility, faster feedback, and empowerment of stakeholders (Humble and Farley, 2010). Frequent delivery helps to achieve transparency and visibility in the project (McHugh *et al.*, 2012; Chong, 2005). Consequently, frequent delivery helps to establish trust in the long term (Siddique and Hussein, 2016a). Our findings regarding ensuring transparency and openness are in agreement with the previous literature.

The findings of this study suggested that persistent cooperation is another enabler of customer involvement. This is in accordance with Beck *et al.* (2001), who states that agile methods require suppliers to collaborate closely with the customer. This is ensured by maintaining cooperation at every level of the project’s development. Working in close “cooperation with customer and teamwork” are the biggest success factors (Layman *et al.* (2006). The customer should understand the agile philosophy, which states that persistent cooperation and collaboration are essential for successful agile deliveries. Creating a level of collaboration with the customer for smooth working can be challenging for some suppliers (Highsmith, 2010; Hoda *et al.*, 2011) and it may require effective communication to build a level of trust (Pikkarainen *et al.*, 2008). Working closely with the customer also helps teams and project managers to ask for the specifications and detailed description of any part of the project that they feel requires further explanations, resulting in trust between both parties.

We have also found that working with agile methods puts some responsibility on the customer side and requires them to have an understanding of how agile works. If a customer has not got that level of maturity, then there a number of conflicts can arise (Siddique and Hussein, 2016c). Making the customer believe that their involvement is significant for the project is difficult, especially if the customer has not used agile methods before. Therefore, the supplier needs to put extra effort into making the customer understand that their involvement is important. The supplier should make an effort to understand the customer. Instead of pre-defining requirements at the planning phase, agile methods rely on continuous customer input (Beck, 2005; Highsmith, 2009). Therefore, in order to get the required information and feedback, the customers are expected to work in close cooperation during the whole development process. Sometimes, the customer's insufficient knowledge about the complexity and size of the system (Cao *et al.*, 2009) requires suppliers to put more effort into the project. It can also be challenging if the customer is not cooperative enough (Fitzgerald *et al.*, 2006). Keeping this challenge in view, Hoda *et al.* (2011) suggested strategies to handle situations when the customer is not cooperating.

Effective communication, cooperation, and transparency and openness through frequent delivery can all contribute to building trust between the supplier and the customer. Communication and collaboration can also help to achieve success in agile methods (Dorairaj *et al.*, 2012; Offner *et al.*, 2011).

7 Research Contributions and Future work

This research addresses the need for further empirical studies in software engineering. The need for more theory-based, empirical studies has been identified by various studies (Hannay *et al.*, 2007; Herbsleb and Mockus, 2003; Sjøberg *et al.*, 2007). The need for empirical studies in relation to agile methods and agile project management is also evident by following studies (Abrahamsson, *et. al.*, 2009; Dybå and Dingsøy, 2008; Suetin *et al.* 2016; Vidgen and Wang, 2009).

The contribution made by this study to the existing body of knowledge is a presentation of the factors that can contribute to enhancing customer involvement in agile software projects. Another contribution that this study has made is in identifying the barriers to customer involvement.

In this study, we have looked into the positive aspects of customer involvement in agile projects. Future research could see if customer involvement has any negative effects; and if so, then they should research how they should be handled. It is also recommended that future research also study how much customer involvement is necessary. For future work we intend to enhance the presented theory/framework with additional data collection and analysis. Another research prospect could be to study in-depth each of the mentioned factors to establish their impact on customer involvement more accurately.

8 Limitations

This study has the following limitations:

1. As Grounded theory studies are said to be context-specific, the possibility of such studies to be called generalizable to a large population is limited (Hussein *et al.*, 2014).
2. Data collection was not made bearing specific project cases in mind, but data for this study is based on the collective experiences of the practitioners.

3. One limitation is the small sample size. As a result, these findings may not be generalizable to a wider population.
4. Most project managers were from the supplier side, therefore the supplier's viewpoint is dominant in this study.

9 Evaluating a grounded theory

A grounded theory study does “not intend to generate factual results or accurate descriptions, but presents an integrated set of plausible, theoretical hypotheses about an underlying pattern of behavior” (Breckenridge, 2010 originally from Glaser and Strauss, 1967). According to Breckenridge (2010) “the emergent grounded theory offers an integrated probability statement that is not intended to be verified as right or wrong, but instead has relevant applicability and modifiability within the substantive area.” Grounded theory study should be tested for fit, work, relevance, and modifiability (Glaser, 1978).

9.1 Fit

Fit refers to the validity of concepts and categories and their fit in the data. The fit is “the ability of the categories and their properties to fit the realities under study in the eyes of the subjects, practitioners, and researchers in the area” (Glaser, 1992). Therefore, grounded theory should present the experiences and viewpoints of practitioners as closely as possible (Nathaniel, 2003).

One suggested an approach to ensure fit is that the researcher should avoid a pre-literature review in order to avoid reconceptualizing concepts and categories so that the data analysis is performed without pre-assumptions about the research topic (Breckenridge, 2010). Following these guidelines, the authors of this present study did not conduct the literature review before all concepts and categories have emerged from the data.

Another way that ensures fit is to continually refine the emerged categories using the constant comparison method (Glaser, 1998), which helps to refine and correct the categories to fit the data from which these are originally derived (Glaser, 1978). Categories are neither static nor rigidly imposed, therefore these can be renamed and restructured to accommodate variation in the data. (Dip, 2009).

9.2 Work

Presented grounded theory's ability to “explain what happened, predict what might happen and interpret what is happening in an area of substantive or formal inquiry” is called work (Glaser 1978 p.4). Participants' main concern must be well presented in the generated theory. In this study practitioners' main concern “customer involvement” is presented well in the theory. Systematic generation of categories in the process of data analysis helped to generate the concepts, codes, and categories to present actual happening in the area of concern.

9.3 Relevance

Relevance refers to whether the theory is grounded in the data and systems analysis steps are followed. This can be ensured if grounded theory procedures are applied and if the problem (research question) and its process of resolution emerge from the data. For this study, we followed Grounded theory coding procedures systematically and all the mentioned factors are categories that were generated from the data.

9.4 Modifiability

The ability of the presented theory to be altered with additional collection and analysis of data is called modifiability (Thulesius *et al.*, 2003). Grounded theory is an “ever-developing entity, not ... a perfected product” (Glaser and Strauss 1967 p.43). Once the grounded theory is developed it is not meant to be proven, instead it should be further modified with additional data collection (Glaser, 2003). The theory emerged “is only ever partially closed, as new ideas will always hone it to better suit current circumstance” (Breckenridge, 2010). The theory presented in this study regarding customer involvement is in a transitory state and is open to further modifications with new data in the relevant area.

10 Conclusion

Customer involvement plays a major role in successful agile projects. A grounded theory study was conducted to study the factors that can have an impact on customer involvement. Based on interview data, this paper presented the enablers and barriers to customer involvement. Enablers are factors that can help to enhance customer involvement. The suppliers listed the following factors: time spent on understanding the customer’s perception of success; effective communication; being forthcoming and accommodating; transparency and openness and establishing trust. The factors the supplier expects to be met by the customer in order for their involvement to be optimal are customer attention; a product owner who understands the business; a good understanding of the technical and functional side; and persistent cooperation. The study suggested the following barriers to customer involvement: not getting enough customer time; lack of understanding on the customer’s part; people without the right skills; and lack of communication. The implications and limitations of this study are also presented

References

- Abrahamsson, P., Conboy, K. and Wang, X., 2009. 'Lots done, more to do': the current state of agile systems development research. *European Journal of Information Systems*, 18(4), p.281.
- Advice, P. (2000), “Study design in qualitative research – 2: sampling and data collection strategies”, *Education for Health*, Vol. 13, No. 2, pp. 263-271.
- Agile Alliance (2001), “Manifesto for Agile Software Development”, available at: <https://www.agilealliance.org/agile101/the-agile-manifesto/> (accessed 15 November 2016).
- Ahimbisibwe, A., Cavana, R. Y. and Daellenbach, U. (2015), “A contingency fit model of critical success factors for software development projects: A comparison of agile and traditional plan-based methodologies”, *Journal of Enterprise Information Management*, Vol. 28, No. 1, pp. 7-33.
- Allan, G. (2003), “A critique of using grounded theory as a research method”, *Electronic Journal of Business Research Methods*, Vol. 2, No. 1, pp. 1-10.
- Ambler, S. W. (2008), “Agile adoption rate survey results”, available at: <http://www.amblysoft.com/surveys/agileFebruary2008.html> (accessed 18 December 2016).
- Babb, J.S., Hoda, R. and Nørbjerg, J., 2014a, August. XP in a Small Software Development Business: Adapting to Local Constraints. In *Scandinavian Conference on Information Systems* (pp. 14-29). Springer International Publishing.

- Babb, J., Hoda, R. and Norbjerg, J., 2014b. Embedding reflection and learning into agile software development. *IEEE software*, Vol. 31, No. 4, pp.51-57.
- Bartolo, I. (2012) "AGILE PRINCIPLE: USER INVOLVEMENT", available at: <http://agileinpractice.wordpress.com/2012/08/02/agile-principle-user-involvement/> (Accessed: 12 December, 2016).
- Batra, D., Xia, W., VanderMeer, D. and Dutta, K. (2010), "Balancing agile and structured development approaches to successfully manage large distributed software projects: A case study from the cruise line industry", *Communications of the Association for Information Systems*, Vol. 27, No. 1, pp. 21.
- Beck, K., Beedle, M., Cockburn, A., Cunningham, W., Fowler, M., Grenning, J., Highsmith, J., Hunt, A., Jeffries, R., Kern, J., Marick, B., Martin, R. C., Mellor, S., Schwaber, K., Sutherland, J., Thomas, D. and van Bennekum, A. (2001), "The agile manifesto", available at: <http://agilemanifesto.org/>.
- Beck, K. (2000), *Extreme Programming Explained: Embrace Change*, Addison-Wesley, Upper Saddle River.
- Boehm, B. and Turner, R. (2003), *Balancing agility and discipline: A guide for the perplexed*, Addison-Wesley Professional.
- Beck, K. and Andres, C. (2004), *Extreme Programming Explained: Embracing Change*, 2nd edition. Boston: Addison-Wesley.
- Bloch, M., Blumberg, S. and Laartz, J. (2011), *Delivering large-scale IT projects on time, on budget, and on value*, Harvard Business Review.
- Boehm, B. and Turner, R. (2004), *Balancing Agility and Discipline: A Guide for the Perplexed*, Addison-Wesley, Boston, MA.
- Breckenridge, J. (2010). *Being person driven in a service driven organisation: a grounded theory of revisioning service ideals and client realities* (Doctoral dissertation, Queen Margaret University).
- Birks, M. and Mills, J. (2011), *Essentials of grounded theory. Grounded theory: a practical guide*, Sage Publications Limited, pp. 1-14.
- Cao, L., Mohan, K., Xu, P. and Ramesh, B. (2009), "A framework for adapting agile development methodologies", *European Journal of Information Systems*, Vol. 18, No. 4, pp. 332-343.
- Carmel, E. (1999), *Global software teams: collaborating across borders and time zones*, Prentice Hall, Englewood Cliffs
- Cermak, D. S. P., File, K. M. and Prince, R. A. (1994), "Customer Participation in Service Specification and Delivery", *Journal of Applied Business Research*, Vol. 10, No. 2, pp. 90-97.
- Chow, T. and D. Cao D. (2008), "A survey study of critical success factors in agile software projects", *Journal of Systems and Software*, Vol. 81, No. 6, pp. 961-71.
- Chong, J. (2005, July), "Social behaviors on XP and non-XP teams: a comparative study", In *Agile Development Conference (ADC'05)* (pp. 39-48). IEEE.
- Cockburn, A. and Highsmith, J. (2001), "Agile software development: the people factor", *Software Management*, Vol 34, No. 11, pp. 131-133.
- Cohn, M. (2010), *Succeeding with agile: software development using Scrum*. Pearson Education.
- Corbin J.M. and Strauss, A. (1990), "Grounded theory research: procedures, canons, and evaluative criteria", *Qualitative Sociology*, Vol. 13, No. 1, pp. 3-21.
- Cottmeyer, G M. (2008), "The goods and bad of Agile offshore development", In *Proc. AGILE 2008 Conference, IEEE Computer Society*, Toronto, Canada, 4-8 August 2008, pp. 362-367.

- Cuiling, G. U. A. N. "The Review on Customer Participation in Service", available at: <http://www.seiofbluemountain.com/upload/product/200911/2008scyxy03a5.pdf> (accessed 10 November 2016).
- Damodaran, L. (1996), "User involvement in the systems design process-a practical guide for users", *Behaviour & information technology*, Vol. 15, No. 6, pp. 363-377.
- Dingsøy, T., & Lassenius, C. (2016), "Emerging themes in agile software development: Introduction to the special section on continuous value delivery", *Information and Software Technology*, Vol. 77, pp. 56-60.
- Dip, C.O.T. (2009), "Demystifying theoretical sampling in grounded theory research", *The Grounded Theory Review*, Vol. 8, No. 2, p. 113.
- Dorairaj, S., Noble, J. and Malik, P. (2012, May) "Understanding lack of trust in distributed agile teams: A grounded theory study", In *Evaluation & Assessment in Software Engineering (EASE 2012), 16th International Conference on* (pp. 81-90). IET.
- Dybå, T. and Dingsøy, T. (2008), "Empirical studies of agile software development: A systematic review", *Information and software technology*, Vol. 50, No. 9, pp.833-859.
- Eckstein, J. (2013), "Agile software development in the large: diving into the deep", Addison-Wesley.
- Fitzgerald, B., Hartnett, G. and Conboy, K. (2006), "Customising agile methods to software practices at Intel Shannon", *European Journal of Information Systems*, Vol. 15, No. 2, pp. 200-213.
- Fowler M. and Highsmith, J. (2001), "The agile manifesto", *Software Development*, Vol. 9, No. 8, pp. 28-35.
- Glaser, B. (1978), *Theoretical Sensitivity: Advances in the Methodology of Grounded Theory*, Sociology Press, Mill Valley, CA.
- Glaser, B.G. (1992), *Emergence vs Forcing: Basics of Grounded Theory Analysis*, Sociology Press, pp.16.
- Glaser, B.G. (1998), *Doing Grounded Theory: Issues and Discussions*, Sociology Press.
- Glaser, B.G. (2003), *The Grounded Theory Perspective II: Description's Remodelling of Grounded Theory Methodology*, Mill Valley, California, Sociology Press.
- Glaser, B.G and Strauss. A.L. (1967), "The discovery of grounded theory: strategies for qualitative research", *Aldine*, Vol. 81, No. 86, pp. 105-115.
- Grisham, P. S. and Perry, D. E. (2005, May), "Customer relationships and extreme programming", in *ACM SIGSOFT Software Engineering Notes* (Vol. 30, No. 4, pp. 1-6), ACM.
- Hannay, J.E., Sjöberg, D.I. and Dyba, T., 2007. A systematic review of theory use in software engineering experiments. *IEEE Transactions on Software Engineering*, 33(2).
- Henriksen, A. (2016), Agile project management. A case study on agile practices, Master Thesis, UiT The Arctic University of Norway.
- Herbsleb, J.D., 2007, May. Global software engineering: The future of socio-technical coordination. In *2007 Future of Software Engineering* (pp. 188-198). IEEE Computer Society.
- Highsmith, J. (2009), *Agile project management: creating innovative products*, Pearson Education.
- Hoda, R., Noble, J. and Marshall, S., (2011), "The impact of inadequate customer collaboration on self-organizing Agile teams". *Information and Software Technology*, Vol. 53, No. 5, pp.521-534.
- Hoda, R., Noble, J. and Marshall, S., 2013. Self-organizing roles on agile software development teams. *IEEE Transactions on Software Engineering*, Vol. 39, No. 3, pp.422-444.
- Hoda, Rashina, James Noble, and Stuart Marshall. "Self-organizing roles on agile software development teams." *IEEE Transactions on Software Engineering* 39, no. 3 (2013): 422-444.
- Humble, J. and Farley, D. (2010), *Continuous delivery: reliable software releases through build, test, and deployment automation*, Pearson Education.

- Hussein, M. E., Hirst, S., Salyers, V. and Osuji, J. (2014), "Using grounded theory as a method of inquiry: advantages and disadvantages", *The Qualitative Report*, Vol. 19, No. 27, pp. 1-15.
- Judy, K. H. and Krumins-Beens, I. (2008, January), "Great scrums need great Product owners: Unbounded collaboration and collective Product Ownership", In *Hawaii International Conference on System Sciences, Proceedings of the 41st Annual* (pp. 462-462), IEEE.
- Kajko-Mattsson, M., Azizyan, G. and Magarian, M. K. (2010, August), "Classes of distributed agile development problems", In *Agile Conference (AGILE), 2010*, pp. 51-58). IEEE.
- Kelley, S. W., Donnelly, J. J. H. and Skinner, S. J. (1990), "Customer Participation in Service Production and Delivery", *Journal of Retailing*, Vol. 66, No. 3, pp- 315-335.
- Koch, A.S. (2005), *Agile Software Development: Evaluating the Methods for your Organization*, Norwood: Artech House, Inc.
- Korkala, M., Pikkarainen, M. and Conboy, K. (2009, May), "Distributed agile development: A case study of customer communication challenges" In *International Conference on Agile Processes and Extreme Programming in Software Engineering*, pp. 161-167, Springer Berlin Heidelberg.
- Lau, A. K., Tang, E. and Yam, R. (2010), "Effects of supplier and customer integration on product innovation and performance: Empirical evidence in Hong Kong manufacturers", *Journal of Product Innovation Management*, Vol. 27, pp. 5, pp. 761-777.
- Layman, L., Williams, L., Damian, D. and Bures, H. (2006), "Essential communication practices for Extreme Programming in a global software development team", *Information and Software Technology*, Vol. 48, pp. 781-794.
- Lee, S. and Yong, H. S. (2010), "Distributed agile: project management in a global environment", *Empirical Software Engineering*, Vol. 15, No. 2, pp. 204-217.
- Lindsjörn, Y., Sjøberg, D. I., Dingsøyr, T., Bergersen, G. R. and Dybå, T. (2016), "Teamwork quality and project success in software development: A survey of agile development teams", *Journal of Systems and Software*, Vol. 122, pp. 274-286.
- Lindvall, M., Basili, V., Boehm, B., Costa, P., Dangle, K., Shull, F., ... and Zelkowitz, M. (2002, August), "Empirical findings in agile methods", in *Conference on Extreme Programming and Agile Methods*, Springer Berlin Heidelberg, pp. 197-207.
- Martin, A., Biddle, R. and Noble, J. (2004, June), "The XP customer role in practice: Three studies", In *Agile Development Conference, 2004* (pp. 42-54). IEEE.
- Marshall, C. and Rossman, G.B. (2011), *Primary Data Collection Methods Designing Qualitative Research*, (pp. 137-177). Los Angeles, CA: SAGE.
- Martin, A., Biddle, R. and Noble, J. (2009, August), "XP customer practices: a grounded theory", in *Agile Conference, AGILE'09.*, IEEE, pp. 33-40
- Maru File, K., Judd, B. B. and Prince, R. A. (1992), "Interactive marketing: the influence of participation on positive word-of-mouth and referrals", *Journal of services marketing*, Vol. 6, No. 4, pp. 5-14.
- McHugh, O., Conboy, K. and Lang, M. (2012), "Agile practices: The impact on trust in software project teams", *Ieee Software*, Vol. 29, No. 3, pp. 71-76.
- Misra, S.C., Kumar, V. and Kumar, U. (2006, June), "Success factors of agile software development", in *Software Engineering Research and Practice*, pp. 233-239.
- Misra, S.C., Kumar V. and Kumar, U. (2009), "Identifying some important success factors in adopting agile software development practices", *Journal of Systems and Software*, Vol. 82, No. 11, pp. 1869-1890.
- Moe, N. B., Dingsøyr, T. and Dybå, T. (2010), "A teamwork model for understanding an agile team: A case study of a Scrum project", *Information and Software Technology*, Vol. 52, No. 5, pp. 480-491.

- Moe, N. B. and Šmite, D. (2007, July), "Understanding lacking trust in global software teams: A multi-case study", In *International Conference on Product Focused Software Process Improvement*, pp. 20-34, Springer Berlin Heidelberg.
- Moe, N. B. and Šmite, D. (2008), "Understanding a lack of trust in Global Software Teams: a multiple-case study", *Software Process: Improvement and Practice*, Vol.13, No. 3, pp. 217-231.
- Mohammadi, S., Nikkhahan, B. and Sohrabi, S. (2009), "Challenges of user Involvement in Extreme Programming projects", *International Journal of Software Engineering and Its Applications*, Vol. 3, No. 1.
- Murphy, D.C., Baker, B.N. and Fisher, D. (1974), *Determinants of Project Success: Management Inst.*, Chestnut Hill, MA, United States.
- Nathaniel, A.K. (2003), *A grounded theory of moral reckoning in nursing*, (PhD dissertation, West Virginia University).
- Nerur, S., Mahapatra, R. and Mangalaraj, G. (2005), "Challenges of migrating to agile methodologies", *Communications of the ACM*, Vol. 48, No. 5, pp. 72-78.
- Nishikawa, H., Schreier, M. and Ogawa, S. (2013), "User-generated versus designer-generated products: A performance assessment at Muji", *International Journal of Research in Marketing*, Vol. 30, No. 2, pp.160-167.
- Offner, A., Swindler, S., Padula, G., King, A., Fedora, J. and Malone, L. (2011, May), "Change management: Developing a tool to foster adaptive collaboration", In *Collaboration Technologies and Systems (CTS), 2011 International Conference on* (pp. 606-611). IEEE.
- Paetsch, F., Eberlein, A. and Maurer, F. (2003, June), "Requirements engineering and agile software development", in *WETICE*, Vol. 3, p. 308.
- Pikkarainen, T., Pikkarainen, K., Karjauoto, H. and Pahlila, S. (2004), "Consumer acceptance of online banking: an extension of the technology acceptance model", *Internet Research*, Vol. 14, No. 3, pp. 224-235.
- Pikkarainen, M., Haikara, J., Salo, O., Abrahamsson, P. and Still, J. (2008), "The impact of agile practices on communication in software development", *Empirical Software Engineering*, Vol. 13, No. 3, pp. 303-337.
- Ries, E. (2011), *The Lean Startup: How Today's Entrepreneurs Use Continuous Innovation to Create Radically Successful Businesses*, Crown Business, NY, USA.
- Rodie, A. R. and Kleine, S. S. (2000), *Customer participation in services production and delivery, Handbook of services marketing and management*, pp.111-125.
- Schmidt, S. (Aug 8, 2011), "The Rules of Customer Engagement", available at: <http://agile-commerce.com/2011/08/08/the-rules-of-customer-engagement/> (Accessed on: 14-12-2016)
- Schwaber, K. and Beedle, M. (2002). *Agile software development with Scrum* (Vol. 1). Upper Saddle River: Prentice Hall.
- Serrador, P. and Pinto, J.K. (2015), "Does agile work? A quantitative analysis of agile project success", *International Journal of Project Management*, Vol. 33, No.5, pp. 1040-1051.
- Shrivastava, S. V. (2010), "Distributed agile software development: A review", *arXiv preprint arXiv:1006.1955*.
- Siddique L. and Hussein, B.A. (2016a), "Grounded theory study of the contracting process in agile projects in Norway's software industry", *Journal of Modern Project Management*, Vol. 4, No. 1, pp. 52-63.
- Siddique, L. and Hussein, B.A. (2016b), "A qualitative study of success criteria in Norwegian agile software projects from suppliers' perspective", *IJISPM-International Journal of Information Systems and Project Management*, Vol. 4, No. 2, pp.65-79.
- Siddique, L. and Hussein, B. A. (2016c), "Grounded Theory Study of Conflicts in Norwegian Agile Software Projects: The Project Managers' Perspective", *Journal of Engineering, Project, and Production Management*, Vol. 6, No. 2, 120.

- Silpakit, P. and Fisk, R. P. (1985), "Participating the service encounter: A theoretical framework", In *Services marketing in a changing environment* (pp. 117-121). Chicago, IL: American Marketing Association.
- Sjoberg, D.I., Dyba, T. and Jorgensen, M., 2007, May. The future of empirical methods in software engineering research. In *Future of Software Engineering, 2007. FOSE'07* (pp. 358-378). IEEE.
- Smith C, King P. (2008), "Agile project experiences: The story of Three Little Pigs", In *AGILE Conference; 2008 Aug 4-8; Toronto, ON, Canada: IEEE*, pp. 378-83
- Standish Group Report, (2015), Available at: <https://www.infoq.com/articles/standish-chaos-2015>, (accessed 24 September 2016).
- Sutherland, J., Schoonheim, G., Rustenberg, E. and Rijk, M. (2008), "Fully distributed Scrum: The secret sauce for hyperproductive offshored development teams," In *Proc. AGILE 2008 Conference, IEEE Computer Society*, Toronto, Canada, 4-8 August 2008, pp.339-344.
- Suetin, S., Vikhodtseva, E., Nikitin, S., Lyalin, A. and Brikoshina, I., 2016, January. Results of agile project management implementation in software engineering companies. In *ITM Web of Conferences* (Vol. 6). EDP Sciences.
- Tanner, M. and von Willingh, U. (2014), "Factors leading to the success and failure of agile projects implemented in traditionally waterfall environments", *Human Capital without Borders: Knowledge and Learning for the Quality of Life*, Portoroz, Slovenia: Make Learn.
- Thulesius, H., Hakansson, A. and Petersson, K. (2003), "Balancing: a basic process in end-of-life cancer care", *Qualitative Health Research*, Vol. 13, No. 10, 1353-1377.
- Turner J.R. and Müller, R. (2005), "The project manager's leadership style as a success factor on projects: a review", *Project Management Journal*, Vol. 36, No. 2, pp. 49-61.
- van Kelle, E., Visser, J., Plaat, A. and van der Wijst, P. (2015, May), "An empirical study into social success factors for agile software development", In *Cooperative and Human Aspects of Software Engineering (CHASE), 2015 IEEE/ACM 8th International Workshop on* (pp. 77-80). IEEE.
- VersionOne. (2015), 9th Annual State of Agile survey. Retrieved from <http://stateofagile.versionone.com/>.
- Waters, K. (30 April 2007), "Key Principles of Agile Development", available at: <http://www.allaboutagile.com/category/10-key-principles-of-agile/>, (Accessed on 2 December 2016)
- Vidgen, R. and Wang, X., 2009. Coevolving systems and the organization of agile software development. *Information Systems Research*, 20(3), pp.355-376.
- Vithana, V.N., Fernando, S.G.S. and Kapurubandara, M. (2015), "Success factors for agile software development â [euro]" A Case Study from Sri Lanka", *International Journal of Computer Applications*, Vol. 113, No. 17, pp. 10.
- Wicks, A.M. and Roethlein, C.J. (2009), "A satisfaction-based definition of quality", *The Journal of Business and Economic Studies*, Vol. 15, No. 1, pp. 82.
- Zheng, X., Cheung, C. M., Lee, M. K., & Liang, L. (2015), "Building brand loyalty through user engagement in online brand communities in social networking sites", *Information Technology & People*, Vol. 28, No. 1, 90-106.

Authors



Lubna Siddique completed her Ph.D. in Software Engineering from the University of Oslo, Norway. Her research interests include working with agile methodologies, agile software project management, working within agile software teams and software process improvement.



Bassam Hussein is an Associate Professor at the Norwegian University of Science and Technology (NTNU) Trondheim, Norway. His research interests include application of gaming simulations, e-learning, project management, and organizational learning. He teaches project and requirements management and has been involved in the design, development, and implementation of a wide range of customized education programs in project management.