

The Role of Social Interactions in Value Creation in Agile Software Development Processes

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ABSTRACT

This position paper presents an emerging research based on a set of expressed statements and impressions from conducted empirical research during the past few years. Agile software development emphasizes on social aspects through its methods and principles. In order to improve the processes within the organization and amongst various stakeholders, there is a need for social processes and various types of interactions to be studied in the context of agile development. The objective of this paper is to present the need to conduct more empirical studies to investigate the socialness of software engineering processes and in particular the role of various type of social interactions in improving development processes and therefore creating more value in organizations.

Categories and Subject Descriptors

D2 [Software Engineering], K.6.3 [Management of Computing and Information Systems]: Software Management: *Software Process*, K.6.1 [Management of Computing and Information Systems]: Project and People Management

General Terms

Human Factors, Management

Keywords

Agile software development, social processes, social interactions

1. INTRODUCTION

In Agile principles, the primary focus is on value creation. In agile development, what ever that doesn't add value, is considered waste [1].

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Additionally, close collaboration and communication is essential to a successful agile team. Instead of 'big design up front', agile development encourages close collaboration with customer, iterative development and feedback. Agile software development highlights the social aspects of software development with explicit values, "such as communication and respect, and explicit principles, such as humanity and reflection" and social factors have shown to be an important factor in agile development [2,3]. Humans are social being and social interaction is the dynamic interplay of people within social structures. The importance of the role of social interactions have been taken into consideration in various fields of study such as economy and a large body of research has considered the role of social interactions in this field [4]. In software engineering world also, there are filed of study such as Global Software engineering [5] and Open source development [6] that have addressed various factors such as the role of cultural differences or the sense of community and their influence on the development processes and the expected outcomes. A study by Whitworth and Biddle, suggests that there are strong social forces at play in agile teams that underline the value of agile methodologies [3]. In addition to [3] which has emphasized the role of social processes in agile development, several studies have reported human aspects and people factor, the role of team works and team dynamics and also other aspects such as individual motivations, communication and knowledge sharing, and even social networks in agile software development processes [7,8,9,10,11].

All the previously mentioned studies [3,4,5,6,7,8,9,10,11,12] in agile software development or other fields such as global software engineering or open source development have emphasized the role of social processes, have studied social aspects, or observed one or more types of social interactions and have stated the need for further research on the role of the studied social aspects. However the studied social processes are not associated with the classification of social interactions existing in sociology for example. To the best of our knowledge, in agile software development processes no studies have been dedicated to study the various types of social interactions (based on the existing classifications and terminologies) amongst various players and with a focus on value creation. This paper presents a need for further future research that considers social processes and various types of social interactions amongst the members and different stakeholders and as a part of software development processes. Based on this need and an existing classification of social interactions, a set of research questions are suggested at the end of the paper.

The remainder of this paper is organized as follow. Section 2, is an introduction to social process and the five known types of interactions. Section 3 presents the inspirations and how and why we think that there is a need for the research topic. And finally section 4 suggests a set of research questions.

2. SOCIAL PROCESSES AND TYPES OF INTERACTIONS

A social process refers to the type of existing relationship between individuals and groups. Sociologists have suggested different classification of social processes. One of the most common kinds is to classify it into five types of Cooperation, Conflict, Competition, Accommodation and Assimilation [13].

2.1 Cooperation

3. Cooperation is one of the fundamental processes of social life and it is an integrating activity. It means working together in the pursuit of common interests or common goal. According to some functionalists, cooperation for human beings is both a psychological and a social necessity [13].

4. There are two modes of cooperation in a social life, which are direct/primary and indirect/secondary. It is primary when cooperation is both a means and an end as it is a highly valued goal like in a family.

5. It is called secondary when cooperation by itself is not a value but a means to an end like in a business when people perform tasks towards a single end [13].

2.2 Conflict

Contrary to the cooperation, conflict is a struggle over values, power and scarce resources. The aim of conflicting persons or groups is not only to gain the desired values but also to win over the rivals or eliminate them. Conflict is universal and occurs in all places and at all time.

Conflict generally occurs due to individual differences, cultural differences, clash of interests and social changes. Conflict might also serve as constructive and positive ends according to some of the sociologists (G. Simmel and L. Coser) [13].

2.3 Competition

Competition is fundamental forms of struggle in strive against each other for the possession of or use of some limited material and non-material good.

As long as attention of competitors is confined to goals, it remains as an impersonal manner.

Most sociologists view competition as a positive thing that can motivate people to achieve goals. Competition tends to stimulate economy, efficiency, and inventiveness. It also tends to increase one's ego and to give one satisfaction.

However, competition can also lead to psychological stress, a lack of cooperation in social relationships, inequality and even conflicts [13].

2.4 Accommodation

Accommodation means resolution of conflict by adjusting oneself to the new environment. Accommodation is the term used by the sociologists to describe the process by those once in conflict who

can work together in common enterprises. It brings arrangements, which permit groups to work together [13].

2.5 Assimilation

Assimilation on the other hand, is a process of interpenetration of cultural life. It is a process whereby persons and groups acquire the culture of the other persons and groups become similar and identified in their interests and values.

But at the same time, the extreme differences in cultural background, prejudice and physical differences usually act as barriers to assimilation [13].

3. THE ROLE OF SOCIAL INTERACTIONS IN VALUE CREATION

During the last three years, we have conducted more than 75 interviews, in various case companies and with different industry practitioners, in order to investigate the software development processes either from the development teams perspective or the organizational perspective. The case companies and in particular the interview subjects were following agile methods and the companies were in the process of scaling agile to all the teams and different parts of the organization. Some of these case studies have been published [14,15,16] and the most recent one is in the submission process [17]. The interviewees were involved in software development processes in one way or other and their role varied. Their role could be a project manager, product owner, software developer, or software architect/designer/tester.

Various aspects have been investigated during these interviews. In some interviews, study participants have been asked to talk about barriers in moving towards agile way of working, continuous integration and continuous deployment. Amongst the answers, mindset of people was pointed out as a barrier. People did not have a very collaborative mindset and this made it difficult. Some barriers were regarding the information and some had raised the need for a better process in regards to receiving the needed information. These aspects could be considered under the **cooperation** category.

Some said that they receive the needed information through social interactions and through informal situations such as "by the coffee machine" [14]. In another study which is about customer specific teams at a large telecommunication company, some of the interviewees believed that the fact that their customers have access to a team, that they can directly talk to and interact with, increases their customers' satisfaction level independent from the quality of the developed feature for example [15]. In those examples sounds that **social interactions in general** play as a factor.

During the interviews for the recent study [17], which investigates the concept of value in 14 development organizations, some of the interviewees did not find the **cooperation** within distributed development processes very satisfactory. Working with suppliers was not always easy and they considered it as hinder towards some values such as fast feedback and deliveries. However, distributed and borderless development teams are not a new concept and are a part of development processes in many big organizations, nowadays.

Particularly in regards to the suppliers, differences in culture were mentioned as a time and energy consuming aspect. Depending on the influential factors, this problem could be seen from **accommodation** aspect or **assimilation** aspect or may be both.

On the other hand, some other teams mentioned the existing **cooperation** within their team members, as one of the strengths and value creation factors and were very happy about it.

Competition in gaining market shares and so delivering quality products in time is a known situation for software development organizations. In addition to the existing competition between various companies and to gain more revenue, we received the impression that concept of “Team” in agile development, which is working in cross-functional independent teams, might create another sort of **competition**. That is the competition of being the better and faster and the “more agile” team than the others.

Conflicts were also another aspect, which were expressed in between the lines. Though, it is hard to know if it is a conflict or just a perception of conflict. Team members were very focused on what is value for their own team and their team performance. While the management decisions did not seem very inline with those internal/team values, sometimes.

4. WHAT ADDS VALUE AND WHAT CREATES WASTE AND UNDER WHAT CIRCUMSTANCES

Based on the expressed statements and impressions received during the conducted interview studies, we believe that there is an emerging need to further study social processes and the type of social interactions in software development organizations and in particular agile. In the examples from the interviews mentioned in section 3, we can see that various types of social interactions has been stated and or played a role in the social interactions amongst various players.

Therefore we think that there is a need to firstly study what kind of social processes exists in agile way of working or what type of social interactions appears more commonly.

Secondly, to investigate in depth what are the impacts of different types of social interactions and to what extent they influence the software development processes and the dynamic between various agile teams.

Almost all the five types of social interactions mentioned in section 2, could have the both positive and negative sides based on their context.

Recalling that creating value and reducing waste is the primary goal for an agile organization, there is a need to further investigate how and when each of the various types of interactions can act as a source of value and when they can be considered as waste.

For example competition could be both constructive /value creating or destructive depending on how and where it occurs.

If we consider cooperation as a positive only aspect, we still need to know if it is equally important everywhere. Where cooperation is the most important? Is it between different stakeholders, between the teams and organization or between the teams and customer? And which one can create more value?

Is the conflict (of interests amongst various stakeholders) always a negative factor or it can be also used as triggers towards more solution thinking or creativity for example?

Increasing our knowledge on this regard, not only assists us to address various improvement needs in the processes, but also might elevate a new condition. It could raise a need for reconsideration of some of the methods and ways of handling agile teams or the processes amongst the organization and various stakeholders.

Therefore, we think that there is a need to conduct more empirical studies within software development organizations and in particular agile organizations to investigate the various aspects of social software engineering.

We suggest a set of research questions as follow:

- Which of the five types of the social processes/interactions exist or occurs more commonly in agile development processes?
- Which of the five types of social processes exists amongst various stakeholders and what types of interactions occur more commonly amongst them?
- Which types of interactions are the most important in improving the agile software processes?
- How the effects of various social interactions can be used to improve software engineering processes?
- What are the tradeoffs between the five types of social interactions in terms of value creation in agile software development processes?
- Which of the interaction types satisfy various stakeholders and in particular the customers the most?
- How social interactions can be assessed or evaluated as parts of software engineering processes?
- How can we define some metrics for measuring the effect of various types of social interactions?
- Which agile practices promote one or more types of social interactions and how?
- Can agile practices be classified into various categories based on their effect and potential in relation to the five types of social interactions?
- Could or should various agile practices be recommended or eliminated based on their potential in promoting various types of social interactions?

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