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# Agile Information Systems Development Teams: Is Empowerment Taken for Granted?

*Research-in-Progress*

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## ABSTRACT

Agile Information Systems Development (ISD) principles emphasize self-organizing teams and empowered individuals in order to build more effective architecture and design. Agile ISD puts a higher emphasis of social interactions and human aspects of software development, and self-organizing teams act as enablers of these human aspects. In agile ISD teams, members have high autonomy over choosing their tasks and the way they perform the tasks. Team members benefit from the collective decision making and shared ownership of the project. However, in the agile ISD literature the terms “self-organization”, “autonomy” and “empowerment” are using interchangeably and without clear and specific definition. Adapting an interpretive case study design in a leading enterprise software company, this research-in-progress differentiates “self-organization”, and “empowerment” and uses the team-level four-dimensional conceptualization of team psychological empowerment by Kirkman and Rosen (1999) (potency, meaningfulness, autonomy and impact), to study whether self-organization indicates empowerment in agile ISD teams.

## Keywords

Agile Information Systems Development (ISD), self-organization, team empowerment.

## INTRODUCTION

Agile ISD methods and practices have been widely adopted in the enterprise software industry. The principles of “The Agile Manifesto” emphasize self-organizing teams and empowered individuals in order to build enterprise systems more effectively. Self-organizing teams have been associated with high productivity (Cohen and Ledford, 1994; Kirkman and Rosen, 1999) satisfied employees, lower turnover, and lower absenteeism (Cohen and Bailey, 1997; Wall, Kemp and Jackson, 1986), and creativity (Houghton and Yoho, 2005). Self-organizing teams are fundamental features of agility in software development (Cohn, 2010; Hoda, Noble and Marshall, 2013; McAvoy and Butler 2009). Agile ISD teams are considered to be democratic, without a strict hierarchy. The process of decision-making resides now with the team members rather than with the team manager. Team members learn how to work together and how to mutually oversee each other (Barker, 1993). Agile ISD places a greater emphasis on people as well as on social interactions, which requires a higher degree of human empowerment and communications.

An agile ISD team should be able to self-organize its challenges and constraints that have been posed by management (Cockburn and Highsmith, 2001; Cohn 2010; Moe Dingsøy, and Dybå, 2010; Takeuchi and Nonaka, 1986). In general, a self-organizing team has autonomy over decisions about policies and programs, and is responsible for determining methods, procedures, and schedules and for making work-related decisions (Tata and Prasad, 2004). The label “self-organizing teams” is most widely used as a synonym for “autonomous teams” (e.g., Moe, Dingsøy, and Dybå, 2008; Pearson, 1992). Some researchers use the terms “empowered teams” and “self-organizing teams” synonymously (Ford, Fottler and Russ, and 1995; Manz and Sims, 1995; Moe et al., 2008), while others differentiate between the concepts (e.g., Kirkman and Rosen, 1999). Kirkman and Rosen (1999) define team empowerment as having four dimensions: potency, meaningfulness, autonomy, and impact. In this study we use the term “self-organizing teams” the same as the term “autonomous teams”. However, the conceptual scope of

“empowered teams” is more specific, since members of empowered teams also share a sense of doing meaningful teamwork towards organizational objectives (Kirkman and Rosen, 1997, 1999; Kirkman, Rosen and Tesluk, 2004).

Researchers try to study and understand self-organization and autonomy in agile ISD teams (Moe et al., 2008, 2010; Vidgen and Wang, 2009). However, a thorough analysis of team empowerment in agile ISD teams within four above mentioned dimensions is deemed to be useful. For instance, Maruping and Magni (2012) argue that through an expanded set of responsibilities and expectations fostered by team empowerment climate, team members may experience work overload, thus reducing their likelihood of exploring and learning. Therefore, the main objective of this paper is to develop an understanding of team empowerment in agile ISD teams and addresses the question: *to what extent agile ISD teams are empowered?*

The remainder of this paper is organized as follows. In the next section, based on the literature, we briefly go through the concept of self-organization and team empowerment and differentiate the concepts. We then present a brief background of self-organization and autonomy in agile ISD teams. Following the introduction of the research design, we then present the preliminarily results of a case study of a multinational software company. Finally, the expected contributions, limitations and further steps are discussed.

## THEORETICAL FOUNDATIONS

### Self-organizing and Empowered Teams

Self-organizing teams are teams which are able to cultivate their own structure (Bunderson and Boumgarden, 2010). They are usually small groups of people (Hoda et al., 2013; Pearson, 1992; Wall et al., 1986) who share highly related and interdependent tasks (Guzzo and Dickson, 1996; Pearson, 1992) and have both authority and responsibility over their work (Pearson, 1992) and decision making (Cohen et al., 1997; Guzzo and Dickson, 1996; Hoda et al., 2013; Hoegl and Parboteeah, 2006; Kirkman and Rosen, 1999; Wall et al., 1986). In self-organizing teams, co-workers have freedom to schedule their tasks and allocate their jobs (Hoda et al., 2013; Morgan, 2006). Self-organizing teams are responsible for variety of tasks (Pearson 1992) and consist of various specializations and different skills (Hoda et al., 2013; Pearson, 1992; Takeuchi and Nonaka, 1986; Wall et al., 1986). Self-organizing teams are identified as social networks (Barker, 1993; Guzzo and Dickson, 1996) and learning systems (Hoda et al., 2013; Morgan, 2006) in an organization. To expand their view for upcoming decisions, such teams need to get feedback from peers and management to assess the goal attainment and learn from everyday work (Hoda et al., 2013; Morgan, 2006; Pearson, 1992). Some researchers associate team empowerment with self-organizing teams (e.g., Manz and Sims, 1995) but others distinguish the concepts (e.g., Kirkman and Rosen, 1997, 1999).

The concept of team empowerment has widely been investigated in management and organization research as well as psychology (e.g. Hempel, Zhang, and Han, 2012; Honold 1997; Kanagaretnam, Mestelman, Nainar, and Shehata, 2012; Kirkman and Rosen, 1999; Kukenberger, Mathieu, and Ruddy, 2012; Mathieu, Gilson, and Ruddy, 2006; Maynard, Gilson, and Mathieu, 2012; Spreitzer, 1995). Basically, there are two different approaches to study empowerment in the literature: structural and psychological (Mathieu et al., 2006; Maynard et al., 2012). On one hand, structural approach focuses on delegation and transition of authority and responsibility from management to employees (Mathieu et al., 2006; Maynard et al., 2012). On the other hand, the psychological approach is concerned with psychological states, cognitions or perceptions of employees that they have control and competence over their job (Honold, 1997; Mathieu et al., 2006; Maynard et al., 2012). Both concepts have been examined at both individual and team levels (Mathieu et al., 2006).

Another version of psychological empowerment is defined by Spreitzer (1995, 1996) in terms of a four-dimensional framework of employees' perceptions: (a) experiencing a sense of value and importance toward their work (b) competence and capability to perform their job well, (c) self-determination or having choice over how to carry out their tasks, and (d) belief that their work has an impact on the organization at strategic and administrative level. Building upon this work, Kirkman and Rosen (1999) advanced the definition of team empowerment as having four dimensions: potency, meaningfulness, autonomy, and impact (Maynard et al., 2012). *Potency* is the “collective belief of a team that it can be effective” (Kirkman and Rosen, 1999 p. 59). *Meaningfulness* refers to a team experiencing its tasks as important, valuable, and worthwhile (Kirkman and Rosen, 1999). *Autonomy* is the degree to which a team manages its own operations, processes, and decisions without a lot of control or guidance from the team advisor (Kirkman and Rosen, 1999; Lewis, 2003). *Impact* refers to significance and importance of work a team produces for an organization (Kirkman and Rosen, 1999). Team psychological empowerment is not only the result

of team having autonomy and control over their task but also the result of members' perceived authority and responsibility (Maynard et al., 2012). In fact, in their meta-analysis Seibert et al. (2011) showed that structural empowerment is an antecedence for psychological empowerment and there is a positive and significant relationship between them. The team-level four-dimensional measure has largely been used and supported by many analysis (Maynard et al., 2012).

### **Agile Software Development and Self-Organizing Teams**

Successful agile teams benefit from team empowerment (Dybå and Dingsøy, 2008; West and Grant, 2010). Besides facilitating software development practices, self-organizing teams are also enablers of human and social aspects of software engineering (Hoda et al., 2013). These social aspects are, for instance, emotional attachment to the organization, greater commitment and motivation to perform and desire for responsibility (Hoda et al., 2013; Moe et al., 2008). Moreover, describing an agile ISD team as a complex adaptive system, Vidgen and Wang (2009 p. 358) defined self-organization as "the ability of interconnected autonomous agents of a complex adaptive system to evolve into an organized form without external force". The ability to intervene and take the appropriate action is what Vidgen and Wang (2009) called "autonomy" of agents in an agile ISD team. Furthermore, Lee and Xia (2010) reviewed the literature on agility and autonomy in software development research. The literature review shows that one of the most important characteristic of agile teams is self-organization and empowerment (Dybå and Dingsøy, 2008; Lee and Xia, 2010).

Not only in organizational research (e.g., Pearson, 1992; Wall et al., 1986), but also in agile ISD research (e.g., Lee and Xia, 2010) the terms "self-organizing", "autonomous" and "empowered" teams were used interchangeably. Self-organizing and empowered teams are both autonomous, but the members in empowered teams experience a sense of effectiveness and meaningfulness in their work towards organizational objectives (Kirkman and Rosen, 1999). In agile ISD, self-organization was defined as the spirit of shared ownership (Cao et al., 2009) and the degree of independence and freedom granted to the team for scheduling the work, selecting and assigning the tasks and decision making (Lee and Xia, 2010). Nevertheless, on one hand, self-organization is most analogous to only one dimension of psychological empowerment (autonomy). On the other hand, measures of self-organization and autonomy are very similar in the literature (Kirkman and Rosen, 1999). Therefore, in this paper we use the term self-organizing and autonomous teams as the same, and raise a question about whether self-organization indicates empowerment in agile ISD teams since the concern about being self-organizing is still worth to study in agile ISD teams. Merely delegating responsibility to the team and giving team members freedom and autonomy for performing their tasks and making team-related decisions (i.e., structural empowerment) is not enough. For example, as Vidgen and Wang (2009) reported, over-communication between team members, over-reliance on informal communication and collaboration, over-reliance of common sense or wrong management practices are, in fact, the inhibitors of agility in self-organizing ISD teams.

## **RESEARCH DESIGN**

### **Research Context**

This study is being conducted in a leading software corporation in which agile development and practices has been adopted for four years in order to increase the efficiency in developing enterprise software products. Scrum is chosen as the main agile development method in the company but it is tailored from team to team and various subsets of agile practices are adopted by teams. This research is embedded in a larger research program aiming at understanding and improving the process of ISD within ISD teams. Headquarter of the company is located in Europe with several locations all around the world. The company values people empowerment, respects team autonomy, and believes in open environment where people can easily speak up, trust each other and share their knowledge. Teams are self-organizing and empowered to selectively implement or change particular techniques according to their own need and situation. Team members have autonomy over choosing their task and how to perform the task. However, the company still has difficulties empowering employees and facing reluctant employees to take over their responsibilities. Despite having multi-skilled and highly expert employees, the managers are still challenging with how to lead the self-organizing ISD teams in the company to give them the autonomy while guiding them within company's strategy and objectives. Moreover, results from employee satisfaction and empowerment in the company show that some aspects of employee empowerment are missing and the team-level

four-dimensional framework seems an appropriate framework to consider the HR department and managers concerns about empowerment in the company.

### Data Collection and Data Analysis

This study is based on a case design (Yin, 2008). We follow interpretive case study guidelines (Sarker and Sarker, 2009 pp. 445–446) to examine and make sense of the data. Teams were chosen according to selective sampling (Coyne, 1997; Glaser, 1978). Selective sampling refers to “the calculated decision to sample a specific locale according to a preconceived but reasonable initial set of dimensions (such as time, space, identity or power) which are worked out in advance for a study”(Glaser, 1978 p. 37). At the time, the agile team was suggested by the senior staff and one of the managers who was responsible for agile process development and learning in the company. The team was responsible for developing and maintaining a banking information system. The team was working in scrum mode since it was assigned two years ago.

The data collection took place in the period between November 2012 and January 2013. During this period the team was at the final phase of the project and maintenance. The data were collected as part of a larger research program on leadership and learning in agile ISD teams. The data collection and analysis consist of two phases. The first phase data collection and analysis intended to address a question about areas in which a leader can influence an agile ISD team learning (cf. Gholami and Heinzl, 2013). The current research question on team empowerment in agile ISD teams emerged from data analysis of the first phase. Since the team meetings were conducted in a non-English native language, a native research assistant visited team meetings during the observation period. She participated in some daily meetings, planning meetings, review meetings and retrospectives during two sprints. The semi-structured face-to-face interviews generally lasted between 40 to 70 minutes (see Table 1). The interviews were recorded or noted and then transcribed. First author was also provided access to relevant internal documents (e.g., internal wiki pages, company survey results on employee empowerment, etc.). During the first phase team members were asked about their job and the team environment, how they perform their tasks, share knowledge, collaborate, manage the conflicts and decide within their team. The second phase is planned to directly address team empowerment in more agile ISD teams in the company.

	Product Owner	Scrum Master	Developer	Translator	Total # of interviews
Team members	1	1	12	1	15

**Table 1. Number of Interviewees**

### PRELIMINARY RESULTS

During the open coding process and referring to the observations, we found that there are some obstacles regarding the knowledge sharing and decision making within the team. Team members did not seem to be highly motivated to learn and collaborate. During the interview, some team members explicitly complained about low autonomy despite being labeled as a self-organizing team. This caused the author to shed more light on the concept of empowerment and on the difference between self-organizing and empowered ISD team.

The preliminary analysis of the first phase interview data and observations indicate that despite their two years experience of agile ISD, team members feel less empowered and more under pressure. According to some of team members, not only was self-organization unable to engender a sense of freedom and meaningfulness; it also implied a sense of being monitored and over-loaded with responsibilities and tasks. This is consistent with Kirkman et al. (1996 p. 49) findings about employees’ concern about the “desirability of team-related assignments” and about the possibility of “increased confrontations with coworkers” while delegating freedom and responsibility to the team. The preliminary findings show that the four-dimensional team empowerment can be affected by two main factors: team leadership and team task.

#### Team Leadership

The formal leaders of the team were the Scrum Master (SM), the Product Owner (PO). The SM was also a developer and the Project Leader (PL) in the team. The role of a PL is not formally defined within the company and team

members did not know why both roles as SM and PL are defined for their team. The SM defined her role of PL as being responsible for system delivery. Besides having two leadership roles for the SM, there seemed to be confusion between roles and responsibilities of the SM (and the PL) and the PO. The relationship between the PO and the rest of the team was not well established and team members believed that the PO does not transfer and clarify customers' need. However, some team members believed that the SM as a PL have a closer relationship to the customers. This ambiguity among roles and responsibilities led to some hesitations about the extent that team could be effective to satisfy customer needs (*potency*). Furthermore, during daily and sprint planning meetings team members were able to take responsibility over each task. It was the responsibility of the SM to make sure that all tasks were assigned to a responsible expert and to prioritize the tasks according to wishes of the PO. Keeping track of the task improvements and problems helped the team to assess the team's ability to perform the task at the end of each sprint (*potency*).

The team shows quite high level of autonomy and freedom over choosing the tasks during the sprint planning meetings and over decision makings during daily and review meetings and retrospectives. Rather than single and central decision making, the team benefits from shared decision making and diffused responsibility. The PO's role in the team was to exert autonomy from external management and the SM's role was to facilitate internal autonomy within team members. Although the PO believed that the team is highly self-organizing and does not need much of management guidance, the rest of the team believed that the PO was lacking leadership capabilities and is not able to guide them (*autonomy*). Furthermore, some team members believed that despite of his lack of guidance, the PO expects them to respond quickly to the urgent customers' needs and to be flexible regarding changes in work strategies or processes (*autonomy*). Also, since there is more than one formal leader within a team, some members felt that they need to have one of those leaders (e.g., PO, SM, or PL) by their side in order their voice to get heard.

Additionally, the PO had one important role to exert the feeling of impact to the team. Basically, the extent customers are satisfied with the product is a way which helps the team to evaluate whether their task has a positive impact on company's customers. This belief mainly originated not from the PO but from the efforts of the SM (in both roles) who was a very experienced person. During two years of close collaboration with the team in scrum mode, the SM was successful to establish the feeling of value within the team (*meaningfulness*), and to convince them that the project matters to the company (*impact*). Moreover, sprint review meeting and retrospectives facilitate close collaboration between the teams and the customers and enable them to receive necessary feedback (*impact*).

### Team Task

Multi-functionality of team members (Vidgen and Wang, 2009) is one of the characteristics of self-organizing teams (Hoda et al. 2013; Pearson 1992; Takeuchi and Nonaka 1986; Wall et al. 1986). Team members are supported not to be specialized only for specific tasks but gain new skills to do different tasks (Gholami and Heinzl, 2013). The team, believed that there are enough sources of information within the team and the company to get the information needed to do the task (*potency*). Agile practices such as pair programming helped the team to have more than one expertise on each topic so others can manage to handle the task and maintain knowledge (*potency*) in case somebody leaves the team temporarily or permanently. Moreover, according to relatively routine task which the team was responsible for the last two years, team members were confident in the team that they are able to perform the task (*potency*).

The team had autonomy over task design, task schedule and task allocation. Team members ensure quality of their task. The team can select different ways to do the team work (*autonomy*). However, as a scrum team, team members believed that they do not have much autonomy over choosing their tasks since skills are clear and the task is automatically assigned to the person who has is specialized for particular task. Hence, multi-skilling is not very much considered. One of the most important inhibitors of both autonomy and meaningfulness in the company since introduction of agile ISD is time pressure. Team members believed that they are very much under pressure to do the backlog items during one sprint and autonomy does not make much sense while the goal is only to finish the task. There is also the impression that scrum is a management tool which divided the task into smaller pieces and does not give room for meaningful activities like learning and innovation (*meaningfulness*).

However, the team believed that they are a unique team and their task is unique for the company (*impact*). Team members believed that what teams does is not under scope of any other scrum team in the company and they share a sense of difference and pride (*impact*). Table 1 shows some examples of open coding.

	Example Interviews	
	Leadership	Task
Potency	SM: In some cases, the information we need is not properly transferred to the team by the PO and this may cause problems for us to do the task well.	Developer: In the team one can get the knowledge he or she want to do the task since there are several sources of information open to the team and offered also by the company.
Meaningfulness	Developer: There is a person in the team who never comes to the meetings and barely talks; this may affect our feelings as a team. I told this indirectly to the SM.	Developer: [For learning and innovation] we don't have enough motivation. I think it is because of the task of the team which is more about maintenance and gives the impression that our job is not any more interesting and important.
Autonomy	Developer: The decisions are just made by the PO, the SM and maybe the architect and we just should do it. For my previous role [in traditional development model] I had more autonomy over my tasks and decisions. In this mode of development, we should have a powerful person by our side to have the chance that our decision is taken into account.	Developer: We really don't have autonomy over choosing a task. In such a small team the skills of each person is known to others and if the task is related to your expertise it is automatically yours.
Impact	Developer: With our team often the topics go from sprint to sprint and they are not getting finished. But I know that there are other teams who try and finish everything in each sprint. Do everything by time. Their [customers] requirements and feedback are not communicated to us properly.	Developer: We are not a very high performance team but I think what the team does is important for the company.

Table 2. Coding Examples

## EXPECTED CONTRIBUTIONS

These initial findings can extend our understanding of team empowerment in agile ISD teams. First, depending on various factors such as the characteristics of team task, stage of the project, team leader behavior, an agile ISD self-organizing team might experience different levels of empowerment. Second, rooted in team effectiveness research, these findings extend recent works on team empowerment in agile ISD by showing that there are several factors that should be taken into account in order to better understand and predict team empowerment. Previous studies on team empowerment confirmed that the two categories (team leader and team task) are antecedences of team empowerment (Maynard et al., 2012).

Also, it is important for managers to know that implementing agility into software development does not necessarily enable team empowerment in agile self-organizing teams. This in depth study of team empowerment gives more insight to managers about the aspects, new opportunities, and behaviors of self-organization and empowerment in agile ISD, which have hitherto been completely or partially ignored or taken for granted.

## LIMITATIONS AND FURTHER STEPS

The results of this study have to be studied in other scrum teams. There was another important management role as a Line Manager. During the interviews, the important role of Line Manager emerged. However, it was not possible to

interview the Line Manager during the data collection period. As mentioned the main aim of the study was to address team learning and leadership in the team and the issue of empowerment emerged from the interviews and some informal talks with managers and the Human Resource department staffs. More data is needed to address team empowerment directly within other teams to enable us both within and cross case analysis.

Analysis of archival data on team empowerment and observing and interviewing more teams in the company are the next steps of this research. For interviews during the next, I intend to use the interview guide by Kirkman et al.(2004) phase.

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