

Agile Project Management, New Leadership Roles and Dynamic Capabilities – Insight from a Case Study Analysis

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Abstract: *This paper emphasizes the microfoundations of organizational agility and explores the interplay between new technologies, organizational structure and processes, leadership style and individual competencies. This interplay is analyzed in a case study conducted in an international information technology company with headquarters in Germany during the period from 2017 to 2019. The focus of the analysis is on the implementation process of agile team work. The outcome is that structural changes, as an isolated step of implementing agile teams, are not able to increase agility and can even lead to unintended effects. An agile team structure can enhance organizational agility when it is accompanied by empowering leadership in conjunction with specific competencies for the implementation of new work concepts. In this regard, the paper provides a deeper understanding of organizational agility regarding the dynamic interaction between certain micro variables.*

Keywords: agility, agile teams, empowerment, empowering leadership, dynamic capabilities

1. Introduction

Agility generally describes a company's ability to adapt and react to changing environmental influences. But what is organizational agility and on what does it depend? Organizational agility has been described as the dynamic capability to recognize constantly changing and often ambiguous requirements in complex environments and overcome resulting challenges by redirecting organizational practices and resources into new areas and problem-solving paths (Eisenhardt, Furr & Bingham, 2010; Felipe, Roldán & Leal-Rodríguez, 2016). Remaining agile is a cost-intensive, continuous investment as it depends on continuous learning and the acquisition of new skills while critically reflecting the state of the art and redirecting resources and activities towards new practices and solutions in an interplay between established structure and innovative options (Uhl-Bien & Arena, 2018). This is not reasonable in principle but practicable if organizations have to cope with high uncertainty (Teece, Peteraf & Leih, 2016).

The microfoundation perspective in dynamic capability research allows the specification of what enhances agility. It results from structure, processes and supporting technology (Crocitto & Youssef, 2003), human factors in terms of leadership style and managerial cognition (Helfat & Peteraf, 2015) and individual

competencies of the work force (Salvato & Rerup, 2011; Wilkens & Sprafke, 2019). Combining these findings into a comprehensive approach, agility can be considered as a multilevel concept specifically emphasizing the interplay between new technologies, organizational structure and processes, leadership style and individual competencies. The crucial point is to cope with conflicts and tensions while finding new connections in order to adapt to multiple and ambiguous demands. Current research emphasizes these antecedents of agility, measures outcomes and allows their specification in terms of:

- reconfigurable, responsive and user-adaptable information technology (IT) solutions with a process view (Raschke, 2010) and business intelligence technologies that enable sensing (Park, El Sawy & Fiss, 2017) and the identification of new business models (Watson & Wixom, 2007);
- team-based work as a contribution of work organization to organizational agility (Muduli, 2016); organizational routines and processes dedicated to integrating outside information and mobilizing internal resources that lead to the productive use of knowledge (absorptive capacity) within a

company (Felipe, Roldán & Leal-Rodríguez,, 2016);

- accelerators of change, such as flexible employment contracts, real-time monitoring of changes in the environment and an adaptable organizational infrastructure (Nijssen & Paauwe, 2012);
- transformational leadership, as it tends to be positively related to organizational agility (Oliveira, Valentina & Possamai, 2012);
- psychological empowerment of staff members as a predictor of agility (Muduli, 2017);
- employees' IT competencies that directly enhance entrepreneurial and adaptive agility and, additionally, facilitate the seizing of short-term opportunities (Chakravarty, Grewal & Sambamurthy, 2013); meta competencies of staff members, such as coping with complexity, continuously reflecting work practices, creativity in combining knowledge components and cooperative skills, allow the adaptation to highly dynamic environments on an organizational level (Wilkens & Sprafke, 2019).

The interdependence of these components can be witnessed these days in the Corona pandemic. Many organizations have had to completely rethink and redirect their offerings to the customer and related production and service concepts. They also had to find new ways of job design for manufacturing and office work and related leadership approaches under conditions of high uncertainty. Against this background, former investments in new information systems which allow the implementation of new structures and processes and the ability to find new practices and solutions enhance the probability of surviving.

It can be concluded that agility results from an interplay between tangible and intangible resources in terms of new technologies, organizational structure and processes, leadership style and individual competencies. This complex interplay in organizational practice is not always easily reflected in comprehensive organizational strategies but is better illustrated by concrete milestones in selected implementation fields where the investments tend to make sense or are easier to explain. The implementation of agile team work is such a milestone (Grass, Backmann &

Hoegl, 2020) which is aimed at increasing organizational adaptability and more easily rationalized as there is a similar development in project management in several organizations at the same time. New leadership styles, self-organized work practices and role models are other components considered as complementing agile team work (Oliveira, Valentina and Possamai, 2012; Parker, Holesgrove & Pathak, 2015; Muduli, 2017). This is especially the case for empowering leadership, which has been considered a leadership approach closely related to agile team work (Sheffield & Lemétayer, 2013; Tessem, 2014; Grass, Backmann & Hoegl, 2020).

It is the aim of this paper to gain a deeper insight into how the components of agility interrelate to each other and discover whether it is the components themselves or their interplay which matters. Therefore, we explore agile team work as an already existing organizational initiative aimed at increasing agility. As a research outcome, we can learn lessons about the overall theory development which can be expanded from the existing fields of practice and contribute to an operationalization of organizational agility. We explore the interplay between the implementation of agile team work and leadership development in a case study analysis, while monitoring a dynamic capability score as the assumed outcome indicator. We present empirical insights from a longitudinal analysis (21 months, 2017–2019) in an international IT service company based in Germany and the United States. Empowerment and dynamic capabilities are assessed in three surveys within that time and the development of agile teams compared with a reference group is monitored. In addition, employee statements at three points in time are analyzed in a qualitative exploration of the perception of agile team work. The explorative approach, including quantitative and qualitative methods of gathering and evaluating data, constitutes a novel integrative method to study organizational agility on three levels and helps to identify important aspects for the enhancement of organizational agility. Our empirical insights suggest that there should be a strong emphasis on empowering leadership conditions.

2. Components of organizational agility

2.1. Agile project management

High attention is paid to agile project management in research and practice because agile team work is associated with a number of

advantages over traditional project management methods (Dybå & Dingsøy, 2008). Agile project management is considered to be the seedbed of agility in many organizations – probably because the need for agility can be better rationalized and specified on a project level. The costs of traditional project management with time-consuming false development activities could no longer be sustained, especially in software development projects (Kerzner, 2017). This is why agile project management was first implemented for software development projects but has meanwhile been transferred and applied to certain fields with project-based work settings (Rigby, Sutherland & Takeuchi, 2016; Hewlett Packard Enterprise, 2017; CollabNet, 2019). Empirical measurements shows positive effects on project performance (Serrador & Pinto, 2015) and job satisfaction (Tripp, Riemenschneider & Thatcher, 2016). It has become obvious that performance measurement or output factors of agile team work refer to established key performance indicators – not only in practice but also in research. A specific measurement of the effects of agile team work on organizational agility is missing.

Regarding the interrelatedness between agile teams and organizational agility, there are indicators that a new form of organizing projects cannot be treated as an isolated issue because effects on performance and acceptance are dependent on the way agile team work is implemented and introduced. Jyothi and Rao (2011) specify implementation criteria in terms of empowering working conditions and communication. Sheffield and Lemétayer (2013) show that agility in existing agile teams depends on two factors: organizational culture and empowerment of the project team. Grass, Backmann & Hoegl (2020) highlight that the acceptance or rejection of empowerment by team members and their leaders is crucial for the actual agility realized in agile teams. It can be concluded that team organization and leadership have to be considered in conjunction in order to reach the intended higher scope of action and problem solving. This can be illustrated by looking at the core principles of SCRUM, the most well-known method of agile project management.

The inefficiency of traditional project management concepts became increasingly prevalent in software development teams in the 1990s. As a broader movement, a group of international experts agreed upon the agile manifesto in order to make the further

development of project management concepts clear. The agile manifesto (Beck et al., 2001) places emphasis on:

- individuals and interactions more than processes and tools;
- working software more than comprehensive documentation;
- customer collaboration more than contract negotiation; and
- responding to change more than following a plan.

SCRUM is a method considered suitable for projects where the ex ante specification of outcomes and product characteristics is rather impossible and, thus, has to be provided within an incremental development process in continuous and close collaboration with the customer (e.g. Schwaber & Beedle, 2002; Srivastava & Jain, 2017). This reduces the structure which is related to specific targets and enhances new practice-based structural components which guarantee coordination according to project needs and avoid the waste of resources within the development process. Agile team work makes use of daily and monthly routines, especially feedback loops among team members in order to keep the information level high, redefine tasks and priorities on a daily basis, and avoid time-consuming malpractice. These principles of guided self-organization are combined with the specification of different roles of group members in order to enhance ownership and responsibility. The role of the product owner was established in order to keep the customer focus high and establish a stakeholder view within the project team. The role of the SCRUM master is designed as a counterpart with high responsibility for the internal coordination and motivation among team members. The SCRUM master is responsible for internal processes. Finally, there are the team members, who take responsibility for the product development itself.

The description of agile team work was originally an issue in software development. During the last few years, it has become increasingly an issue of management studies. This extended the view to the characteristics of organization, communication and leadership and the recognition of implementation challenges (e.g. Jyothi & Rao, 2011). It especially paid more attention to the meaning and challenging issues of the managerial constructs and reduced former misinterpretation of organizational categories, which came out from computer specialists using

phrases from organization studies in a sometimes misleading manner. The managerial perspective creates a better understanding that the core principle of agility is based on daily routines for enhancing efficiency (Mahringer, Gabler & Renzl, 2017). Otherwise, the entire idea of organization could have been misunderstood as a revival of self-organization concepts, because this term is often used but with another meaning in its origin within autonomous work groups (Pearson, 1992). The principle organization of agile team work is much closer to the Toyota production and Kanban system (Lei et al., 2017). However, agile team work goes further in the following manner: it is an issue of the role definition of team members and empowering working conditions (Tessem, 2014; Moe, Dingsøyr & Dybå, 2010; Srivastava & Jain, 2017). Tessem (2014) shows the higher level of structural empowerment among team members working in agile settings in a comparative case study analysis between agile and non-agile teams. There is a need to build further on this finding and learn more about the interplay between structural and behavioral components.

To sum up: agility is a core subject while practicing new methods in project management, but agility, in itself, is not the core of operationalization and measurement. There is still a focus on more traditional performance indicators. Moreover, the interplay between the structure, routines, practices and role behavior of team members and team leaders is a crucial point which has been highlighted in recent calls for a deeper empirical exploration.

2.2. Empowering leadership complementing agile project management

Leadership is a core issue in organizational agility (Arena & Uhl-Bien, 2016; Uhl-Bien & Arena, 2018) and in agile project management (Tessem, 2014; Srivastava & Jain, 2017). Research on agile team work often shows that leadership can be considered an implementation challenge (Boehm & Turner, 2005). Within the literature on organizational agility, leadership is the core function of coping with complexity and, thus, matters in a much more principle manner (Uhl-Bien & Arena, 2018). Even though the focus might be narrower or broader, both perspectives underline that there is an interplay between structure and processes with leadership for enhancing agility. Leadership has to bridge tensions and paradoxes, especially between demands of exploitation and exploration (see

March, 1991) and related approaches of operational/executive and entrepreneurial leadership style (Meyer & Meijers, 2017; Uhl-Bien & Arena, 2018) in order to find innovative ways of problem solving under conditions of uncertainty while sustaining efficiency needs. This is why authors highlight the relevance of ambidextrous leadership (Rosing, Frese & Bausch, 2011).

As there is a need to transfer these considerations into role descriptions for leaders and there are different ways to practice ambidexterity, recent publications pay a lot of attention to empowering leadership complementing agile team work (Boes et al., 2020). The balance between exploitation and exploration results in routines for continuous reflection on action in very short time cycles (sprints and other routines for enhancing exploitation) and the empowerment of employees in order to enhance their self-determination and responsibility for innovative solutions (leadership and group behavior enhancing exploration). On the one hand, it is the team structure which is dedicated to exploitation and, on the other hand, the leadership style, with its emphasis on the responsibility of team members, which is dedicated to keep exploration high and support an innovation-oriented culture. Research shows that the use of specific roles and clear sequences of exploration and exploitation embedded in SCRUM fosters ambidexterity (Sailer, 2019).

Since agile teams are considered self-organized, it is important to understand what leadership means in these teams. The role of SCRUM masters bears some resemblance to that of traditional project leaders, however, SCRUM masters are not viewed as leaders but more as moderators and facilitators (Yi, 2011; Bass, 2014). Case studies could show that the distribution of leadership is an important aspect for the functioning of agile teams and too much emphasis on the SCRUM master as a leader can be problematic (Moe, Dingsøyr & Kvangardsnes, 2009). The role of empowering self-organizing teams with shared leadership usually falls to the head of the department or even top management (Moore, 2009; Rigby, Sutherland & Takeuchi, 2016).

Empowering leadership integrates both structural and psychological empowerment (Spreitzer, 1996; Arnold et al., 2000). Structural components refer to access to resources, freedom in decisions and encouragement of initiatives (Laschinger et al., 2001).

Psychological empowerment refers to individual self-efficacy, and perceived meaningfulness and responsibility (Spreitzer, 1996). There are different ways to assess empowering leadership: in a more direct manner to evaluate the leadership behavior (Arnold et al., 2000) or in a more indirect manner while monitoring the empowerment score of team members (Rogers, Chamberlin & Ellison, 1997; Spreitzer, Kizilos & Nason, 1997; Herrenkohl, Judson & Heffner, 1999; Stewart et al., 2010).

To sum up, empowering leadership is an important prerequisite to practicing agile team work in an intended way. It is often seen as an implementation challenge as it is not self-evident how to practice empowering leadership (Wong & Giessner, 2018; Boes et al., 2020).

2.3. Measuring agility in terms of dynamic capabilities

Agility has been defined as the “ability to enable sensing environmental changes and responding efficiently and effectively to them” (Felipe, Roldán & Leal-Rodríguez, 2016) and “an organization’s ability to quickly sense and respond to environmental changes in order to quickly seize market opportunities” (Park, El Sawy & Fiss, 2017). Definitions such as this are very close to the concept of dynamic capabilities (Teece, Pisano & Shuen, 1997; Teece, 2007). Many studies suggest directly that agility is a specific form of dynamic capability (Felipe, Roldán & Leal-Rodríguez, 2016; Panda & Rath, 2021). Teece, Peteraf & Leih (2016) also make the argument for a strong link between the concepts agility and dynamic capabilities. The few specific measurement approaches for agility are, in some cases, very similar to measures of dynamic capabilities (Cegarra-Navarro, Soto-Acosta & Wensley, 2016). A notable exception is the work by Charbonnier-Voirin (2011), which focuses on practices associated with organizational agility that are grouped into the four areas of mastering change, valuing human resources (HR), cooperative practices and practices of value creation for customers. Dynamic capabilities and organizational agility are closely related constructs. As the measurement of dynamic capabilities has already generated a large body of empirical work, these measurement approaches can be considered as supportive for decisions on how to measure organizational agility. Laaksonen and Peltoniemi (2018), in their systematic review on quantitative measures of dynamic capabilities, identified 232 operationalizations of dynamic capabilities that differed, *inter alia*, in scope, theoretical

foundation and type of data. In order to find a suitable approach for measuring agility, the following methodological issues from dynamic capability research can be transferred.

2.3.1. Indicators of agility

It is a crucial part of the operationalization to decide on suitable observable indicators because agility and dynamic capabilities are latent constructs and, therefore, not directly observable. Approaches can be divided regarding a focus on:

- what companies *have*: exemplarily, the financial situation or new technologies (e.g. Chang & Tzeng, 2010; Karimi & Walter, 2015);
- what companies *do*: exemplarily, the innovative behavior of employees, reengineering of processes and constant monitoring of changes in the market (e.g. Hsu & Sabherwal, 2012; Janssen, Castaldi & Alexiev, 2016);
- what companies *have done*: exemplarily, past decisions, such as acquisitions or restructurings (e.g. McKelvie & Davidsson, 2009; Wilhelm, Schlömer & Maurer, 2015); and
- what companies (supposedly) *can do*: direct assessments of specific abilities or capabilities, mostly associated with sensing, seizing or reconfiguring (e.g. Protogerou, Caloghirou & Lioukas, 2012; Batra et al, 2015).

It is notable that many studies on dynamic capabilities and agility (Cegarra-Navarro, Soto-Acosta & Wensley, 2016) use more than one of the four outlined types of manifestations in a single scale. A debate about these different approaches is missing. It can ease the interpretation of agility studies to specify the focus of measurement, whether it is on assets, actions or potentials.

2.3.2. Suitable data sources

Most studies rely on asking knowledgeable people within the company questions about the company’s abilities to adapt (Laaksonen & Peltoniemi, 2018). The vast majority of studies rely on single respondents, usually CEOs or members of top management (e.g. Pavlou & El Sawy, 2011; Wilden et al., 2013; Arend, 2014). An approach to increase the reliability of the data is to survey employees instead of single top managers (e.g. Wilkens, Menzel &

Pawlowsky, 2004; Salge & Vera, 2013). These approaches view dynamic capabilities and agility as an emerging pattern that is shaped by the interaction between employees with or without leadership responsibility and, therefore, aim at analyzing the collective minds of the workforce. All of these approaches have strengths and weaknesses and rely on theoretical assumptions and the recognition of contextual factors of the companies in the study. As agility can be regarded as a multilevel phenomenon, asking all employees has the potential to gather more relevant information than using single respondents in top management.

2.3.3. Cross-sectional and longitudinal designs

Even though change only becomes visible over time, barely a small number of studies on dynamic capabilities use longitudinal designs (Laaksonen & Peltoniemi, 2018). This is also the case for agility. Longitudinal data allows the examination of a research phenomenon (in this case, influencing factors of agility) in the process (Rajulton, 2001).

Agility is a complex phenomenon that can be studied on multiple levels. Research on the closely related construct of dynamic capabilities shows that measuring agility involves decisions about suitable observable indicators of agility, data sources and study design that rely on theoretical assumptions and research context.

3. Research methods

Empirical data for our analysis comes from a case study analysis conducted in an IT company. The latter provides IT services for e-commerce businesses. It was founded in Germany in 2005 and is also based in the United States, Japan and China. Data collection was initiated by the company in a third-party founded project in order to monitor crucial performance indicators that lie on the individual level and evaluate the impact of HR measures. This monitoring was the task of an independent research team and took place from 2017 to 2019. The research objective was to shed light on the collective perception of organizational efforts to increase agility. The main measures of these efforts were the transformation of two development teams into agile teams shortly before the monitoring started and a company-wide focus on empowerment. In addition, further measures were implemented during the monitoring process. Three different approaches were combined to account for the dynamic interplay of these measures, employee

reactions and survey results: an interview with the head of HR, quantitative measurement of key indicators of agility and qualitative analysis of open statements.

General information about the measures that were implemented to foster agility and about organization-specific context factors result from a semi-structured expert interview with the company's head of HR. The interview was conducted in March 2019 and aimed at understanding which measures to increase agility were implemented during the monitoring period and when they took place. This information is crucial to link the results of the quantitative and qualitative analyses with specific organizational activities and interventions. The interview was held in German and answers from the transcript were subsequently translated into English.

Quantitative data on empowerment and dynamic capabilities was collected at three points in time between February 2017 and November 2018 using online surveys. All employees of the company received invitations to participate in the surveys. The online survey was sent out in the English language since all employees regularly use it for internal communication. The total number of employees increased, starting with 295 in February 2017 and ending with 331 in November 2018. Response rates varied between 58 and 61 %, which are acceptable rates for employee surveys (Baruch & Holtom, 2008).

The empowerment score was measured with twelve items that were taken from previous studies. The items incorporate psychological empowerment (Spreitzer, 1995), structural empowerment (Laschinger et al., 2001; Sprafke, 2016), empowering leadership (Arnold et al., 2000) and team-based empowerment (Wilkens, Keller & Schmette, 2006; Sprafke, 2016). An example of psychological empowerment is: "I can decide on my own how to go about doing my work." An example of structural empowerment is: "Strategies, vision and goals in my organization are transparent to me." An example of team-based empowerment is: "In our team, we try to learn from each other." All items are listed in Appendix A. The employees rated their degree of approval to each item on a seven-point Likert scale.

As a measure of agility, dynamic capabilities are measured with the established eight-item scale by Hsu and Sabherwal (2012), which consists of statements with a clear focus on specific actions a company undertakes towards

flexibility and adaptability (e.g. “In our company, we integrate different areas of knowledge to improve innovations in products/services”; “In our company we are alert to environmental changes and respond to them”; see all items in Appendix A). The focus on specific actions ensures that employees can provide meaningful estimations of the organization’s dynamic capabilities. The employees rated their degree of approval to each item on a seven-point Likert scale.

All employees were asked whether they work in a traditional or agile team. This was not to compare the two types of team structure but to identify those respondents who had to cope with the implementation of a new type of work organization and compare the answers to a reference group of respondents who did not have to cope with a new type of organization. Agile teams within the company mainly use SCRUM, even though company-specific adjustments had been made over the years. Members of the reference group also work on a team basis but according to a waterfall model. They were familiar with this type of project organization and did not have to cope with change. There were 47 participants in the agile structure and 138 participants in the reference group in February 2017. There were only agile teams in the development department during the period of analysis as this was a starting point to experience new concepts of work organization. However, this was not considered to implement an agile structure throughout the company as traditional team structures that work according to a waterfall model were considered as effective in other departments (e.g. accounting, HR) for the foreseeable future. Members of agile teams and the reference group did not differ regarding sex, $X^2(2, N = 171) = .02, p = .891$. age, $X^2(4, N = 172) = 6.08, p = .193$. or tenure, $X^2(3, N = 176) = 2.14, p = .544$. Since agile teams do not incorporate traditional forms of leadership, management responsibility was more common in the reference group, $X^2(2, N = 174) = 6.71, p = .035$. The data analysis makes use of simple comparisons of means (independent samples t-tests) for each point in time between respondents from agile teams and the reference group.

Complementary to the quantitative measures, employees were asked to specify possible areas of improvement in open statements in February 2017 and November 2018. In February 2017, employees provided 109 statements. In November 2018, 82 employees provided a statement. The statements are used

as a second measure for empowering conditions that generate a more fine-grained analysis of the structural and psychological aspects of empowerment. In addition, the statements from agile team members and respondents of the reference group are compared to understand reasons for possible differences between agile and traditional teams.

The comments and interpretations given by a group of 12 members participating in a survey feedback session in April 2017 were another source of information. The attendants were three board members together with first tier managers from Germany and the US.

The data evaluation of the open statements given in the survey, the survey feedback discussion and the expert interview follows the principles of a qualitative content analysis after Mayring (2000). While the expert interview was primarily aimed at searching for relevant information and facts about the overall process, the statements given in the survey or the discussion of survey findings were used to interpret the data regarding context or individual motivation and (unfulfilled) expectations. The overall research design can be characterized as a mixed method approach as it tries to gather data from different sources in order to understand the case and draw an overall picture. The adoption of a mixed method approach provides a better understanding of a complex research phenomenon (Molina-Azorin, 2016). The combination of qualitative and quantitative data facilitates an understanding of the interplay of agile team work, leadership development and organizational agility. The qualitative and quantitative analysis is closely related to avoid integration problems inherent to mixed methods research (Bryman, 2007) by focusing on the central question – how empowerment, leadership and agility are connected.

4. Results

4.1. The process of implementing agile team work

The overall description of the implementation process results primarily from the expert interview with the head of HR. It specifies the timeline when implementation steps of agile team work took place and at what points of time this was combined with data collection (see Figure 1). As the company is from the field of IT services and provides platform solutions, it is close to the original community of agile team work (software development). Nevertheless, it was initially organized in traditional teams. At

the beginning of data collection, two development teams were officially operating as agile teams (which started shortly before the beginning of the monitoring period). All other teams within the company worked in traditional team structures which were familiar to the respondents. There was no change during the monitoring period and nothing was initially planned to be changed in the near future, because corporate management does not regard agile teams as an overall advantageous concept (statement of the head of HR and in the survey feedback discussion). An agile team structure was considered suitable for tasks where the ex ante specification of customer solutions was impossible. At the very beginning, there was an emphasis on the wording of agile team work, but the meaning remained somehow implicit. It was more the overall idea that there is a new team structure giving increased autonomy and self-organization to team members combined with new leadership roles. However, there was no written documentation and specification. One of the agile teams participated in a training session, the other group started without explicit preparation. The notion of empowerment and the consciousness of its relevance had already existed when the implementation process started. However, similar to the notion of agile, there was no explanation of the meaning and a shared understanding did not exist (statement of the head of HR).

The results of the first survey (see below) revealed what had already been assumed among the board members, that agile teams did not work as planned (statement in the survey feedback session). Consequently, the conscious knowledge of implementation

challenges increased and more emphasis was placed on the preparation for agile team work: a workshop was initiated and the survey results were discussed with the employees. The workshops revealed that especially one of the two agile teams was dissatisfied, whereas the other one reported overall positive signals. The unsatisfied agile team had different tasks than the other team, but this was attributed more to the specific characteristics of the work context, such as an older platform, mostly maintenance and 'bugfixing' tasks. As a further step, a development process was initiated where a new head of development with a profound experience in agile methods established a clear structure within the teams and provided a coherent vision of how agile methods can be applied successfully. The head of development worked on clear and transparent guidelines for agile work.

The problems with agile teams also pointed at leadership issues in other departments. Even though empowerment has been a core principle in the company, the leadership role has not received much attention. As a result, team leadership was targeted by establishing a new leadership model with a focus on empowering leadership and the communication of a clear vision for agile team work. The empowering leadership model is being further developed beyond the monitoring period and is shaped and discussed in leadership peer groups.

In the eyes of the head of HR, the previous problems in agile teams can be attributed to deficits in the basic understanding of agile team work. At the beginning, there was a misconception that a higher level of self-organization would imply a lower level of routines and structures.

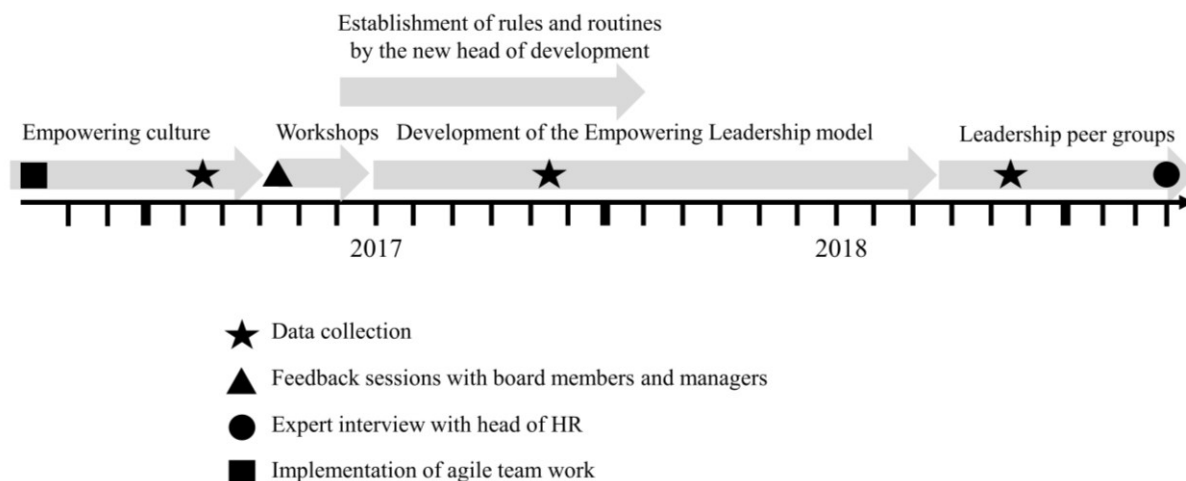


Figure 1: Timeline of data collection and organizational measures

“From our perspective, a very clear structure is extremely important. Agility and agile work is not possible if there is no specific framework of how to operate. [...] Our new head of development revisited the concept of agility in a fresh approach. Since then, agile teams have functioned well because there is someone who has implemented agile teams according to the framework.”

In addition, the leadership development in the company lacked emphasis on a clear vision regarding what agile team work implies for the leadership role. This led to the occasional misunderstanding that the empowerment of team members would go hand in hand with less leadership. This confusion mainly affected members of agile teams.

“Like in a typical startup at that time, many young employees attained leadership positions quickly. There were occasional leadership workshops, but there was no common understanding.”

4.2. The interplay of agile team work, empowering leadership and dynamic capabilities

The core constructs of the analysis were measured on a quantitative basis at three times with the help of employee surveys. The measures for empowerment and dynamic capabilities show a high internal consistency

that is stable in all three surveys (empowerment: $\alpha = .91; .93$ and $.94$ for 2017, 2018 and 2019, respectively; dynamic capabilities: $\alpha = .93, .95$ and $.95$ for 2017, 2018 and 2019, respectively). The correlation between empowerment and dynamic capabilities is moderate and statistically significant at all three points in time (see Table 1).

As depicted in Figure 2, agile teams had lower scores in empowerment at the beginning compared with the reference group. These differences were statistically significant in February 2017. By November 2018, the differences had vanished. Perceptions of dynamic capabilities were initially lower in agile teams than in the reference group. This changed over time.

Agile teams reported lower empowerment than respondents from the reference group in February 2017 and a higher score in November 2017, respectively November 2018. These differences in empowerment between agile teams and the reference group were only significant for the first point of measurement in February 2017. The differences in dynamic capabilities were only significant in November 2017. The means, standard deviations and the results of the t-tests are listed in Table 2. Other statistical variations of empowerment and dynamic capabilities between 2018 and 2019 are not significant (empowerment: $t(377) = 0.07$,

Table 1: Correlation between empowerment and dynamic capabilities

	2017 (n = 182)	2018 (n = 185)	2019 (n = 193)
Empowerment – dynamic capabilities	.46**	.55**	.56**

Note: ** p < .05

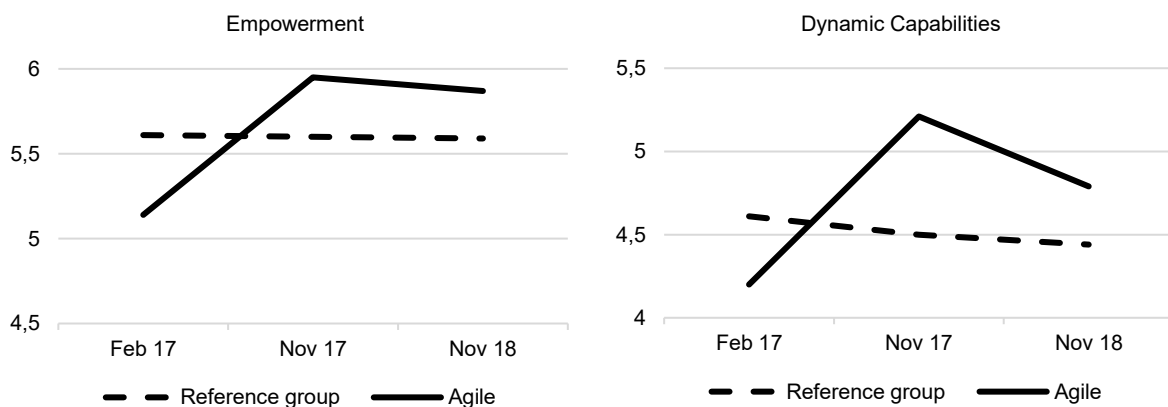


Figure 2: Development of empowerment and dynamic capabilities in agile teams and group of reference

$p = .945$; dynamic capabilities: $t(383) = 0.93$, $p = .351$).

The overall picture of the quantitative analysis suggests the following: agile teams that were implemented to increase agility reported lower empowerment and lower dynamic capabilities than members of the reference group that did not have to cope with change. After the internal discussion of the results in the survey feedback workshops and two changed projects (redesign of agile according to agile principles and rules; development and rollout of a unified empowering leadership model), agile teams not only caught up with respondents from the reference group but reported higher empowerment and higher dynamic capabilities. In brief: agile team structures could only function as a means to foster organizational agility when they were aligned with appropriate processes and an internalization of new leadership principles.

4.3. Employees' experiences with agility

The open statements given in the survey allowed us to gain a deeper understanding of the phenomenon described above that agile teams scored lower than members of the reference group a short time after their implementation but increased empowerment and the perceptions of dynamic capabilities in the further course of their development.

The main critical remarks of agile team members compared to other respondents in February 2017 fall into two categories: a) Employees in agile teams complained about leadership and structure in their teams.

"I understand that Agile should help us to improve the current workflow and speed up

processes. But when I get the feedback that internal meetings are more important than deadlines, external meetings or external calls, I can no longer actually take it seriously. [...] Clients are controlling our sprint planning and we got to the point where we were only reacting but not proactively changing or improving concepts. [...] In addition, having no hierarchy is not well thought out. There is no motivation to get better, to reach another level and there is no team-lead where you can define different goals that you need to achieve at a certain time."

"More leadership in development, less pressure on the individuals."

b) Members of agile teams feel that empowerment is not working well in their teams and request less empowerment and more structure. Several employees in agile teams essentially requested whether they could undo the changes in the team structure and go back to traditional team work.

"More structure, more guidelines for newbies, less immediate 'empowerment'."

"Implement hierarchy instead of self-organized teams."

The open statements showed no differences between members of agile teams and respondents from the reference group in other categories that were often addressed (salary and benefits, career opportunities, products and solutions, communication and collaboration, strategy). All categories and example statements are listed in Appendix B.

By the end of 2018, after the agile teams had been redesigned and the empowering leadership model was rolled out (see time line

Table 2: Means, standard deviations and results of the t-tests

		Feb 17		Nov 17		Nov 18	
		AT	RG	AT	RG	AT	RG
Empowerment	M	5.14	5.61	5.95	5.60	5.87	5.59
	SD	1.30	1.02	1.00	1.22	.90	1.29
	n	46	136	40	138	49	132
		t (180) = 2.25, ** p = .028		t (176) = -1.68, p = .094		t (179) = -1.37, p = .174	
Dynamic Capabilities	M	4.20	4.61	5.21	4.50	4.79	4.44
	SD	1.37	1.23	1.37	1.38	1.36	1.41
	n	47	137	39	138	49	132
		t (182) = 1.934, p = .055		t (175) = -2.84, ** p = .005		t (179) = -1.51, p = .134	

Note: AT = Agile team; RG = Reference group; ** p < .05

in Figure 1), the differences in open statements vanished. At this time there was no systematic difference between the respondents from agile teams and the reference group. The initial focus on the team-specific affairs disappeared and a broader company-wide view occurred.

5. Discussion

We explored microfoundations of organizational agility, while focusing on the phenomenon of agile team work in a case study analysis. The core interest of our analysis was to gain a deeper understanding of the interplay between new technologies, organizational structure and processes, leadership style and individual competencies from a longitudinal analysis (21 months), while using quantitative and qualitative data to draw a comprehensive picture.

We gained deeper insights from the case study analysis regarding how crucial building blocks of agility on the three levels processes/structure, human factors/leadership and competencies fit together in order to bring about agility and how their interplay develops over time. It turned out that agile team structures alone (on the level of structure/processes) led to an unorganized time-consuming system which produced double work instead of granting flexible implementation of customer needs. It became clear that such an unguided system cannot enhance either empowerment or agility. In the case study, this led to the noticeable observation that the designated agile teams felt less empowered than traditional teams. Some employees with low empowerment scores suggested that more structure and a clear definition of the work process were needed. These results can be explained through previous research that laid out how autonomy does not always enable

creativity and innovation. By contrast, limits to autonomy can be crucial for creative results (Gebert, Boerner & Lanwehr, 2003; Ortmann & Sydow, 2018). Our study supports the notion of limits to autonomy and highlights the crucial role of leadership for providing a productive amount of autonomy.

We could show that a serious problem was a missing leadership approach (level leadership) complementing the new agile team structure. It was only after intensive training of empowering leadership through an experienced agile coach (level of competencies) that team members of agile teams felt empowered in their work and found ways to self-organize in an efficient manner. This is in line with what Wong and Giessner (2018) show when they describe the thin line between empowering and laissez-faire leadership and that principles of empowerment can easily be misinterpreted as a laissez-faire approach (see Table 3). This was the case at the beginning when the company started with agile team work, and no active management of freedom and constraints was conceivable for agile team members (Ortmann & Sydow, 2018). In later stages, after agile teams had been reorganized and empowering leadership internalized, the assumed misinterpretation in leadership behavior could be resolved. The overall positive development of the agile teams was, therefore, a result of a learning process within the company that led ultimately to a concerted effort aimed at promoting agility on different levels.

Our findings result in a substantial contribution toward a better understanding of organizational agility from a microfoundation perspective. The outcome of the case analysis allows us to highlight critical components of agility in terms of structure, leadership and competencies,

Table 3: Differences between empowerment and laissez-faire

Field of distinction	Empowerment	Laissez-faire
Leadership role	Active, coach, servant for team members' self-organization	Supportive on demand
Structure	Most relevant and dedicated to team members' access to information and resources	No specific outline, no reflection on working structure
Follower role	Most relevant for problem solving, needs to be challenged and developed	Rather passive, hanger-on
Responsibility for decision-making and performance	Followers task	Not always clear, vagabonding
Monitoring and control	Self-control, commitment, self-management	Part of the organization, rather scattered

resulting in an integrative empowering leadership approach that supports the interpretation of the meaning of new agile structures and encourages team members to take responsibility and ownership. This is close to what Uhl-Bien and Arena (2018) underline in their complexity leadership approach and Wilkens and Sprafke (2019) show regarding the relevance of empowerment for sustaining dynamic capabilities. Concerning the overall research on organizational agility, the findings identify the most critical variables for enhancing agility. On the outcome level, this also corresponds with findings from other industries, even though the course of development might differ. Boes et al. (2020) describe implementation challenges in the manufacturing industry, where standards in lean management and Kanban create the starting point for implementation and often lead to an overload of structure. However, a missing approach or misleading interpretation of empowering leadership is a comparably crucial point.

From a methodological standpoint, our mixed methods approach could illustrate how building blocks of agility on different levels affected empowerment and agility over time. The combination of qualitative and quantitative data provided a deeper understanding of the implementation process of agile team structures in the company and allowed us to draw preliminary conclusions about principles for enhancing organizational agility that can inspire future quantitative research to find out whether these principles are applicable to other implementation processes of agile team structures.

6. Limitations and outlook

The case study analysis presented goes beyond the empirical analysis which has existed so far and provides a deeper understanding of the interplay between new technologies, organizational structure and processes, leadership style and individual competencies. As is typical for case study research, there is an emphasis on the phenomenon itself and its influencing factors. The generalization relates to this phenomenon, placing emphasis on the interrelatedness between the components, but this should not be confused with a statement about the frequency of the phenomenon. This research has to be complemented by cross-sector quantitative field research which can build on the proposed building blocks of organizational agility identified in the case study. The basis for this further step, provided

here as constructs, is specified and operationalized.

In our study, empowerment and agility were relatively high in both agile teams and the reference group. Therefore, the difference between functioning agile teams and the reference group were not significant, which may be due to the fact that empowerment is held high throughout the company. Future quantitative research can find out whether agile team structures that are in line with appropriate leadership and corresponding competencies are superior to corresponding functioning traditional team structures.

The case selected refers to the overall constructs but remains context-specific regarding the firm history and characteristics of the branch. Consequently, the course of development might differ between different industries. However, the relevance of constructs might sustain across sectors. We suppose that agile team structures and empowering leadership in conjunction with specific competencies for the implementation of these structures are crucial for enhancing organizational agility.

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Appendix A: items and scales

Empowerment

Strategies, vision and goals in my organization are transparent to me.
I have access to all resources necessary to do my job well.
I receive all necessary support from my supervisor in order to do my job well.
I receive all necessary support from my colleagues in order to do my job well.
I can decide on my own how to go about doing my work.
I have considerable opportunity for independence and freedom in how I do my job.
In our team, we pull together.
In our team, we deal with conflicts in a constructive way.
We have open dialogue within our team.
In our team, mutual feedback is common.
In our team, we try to learn from each other.
In our team, we make decisions quickly.

Dynamic Capabilities (In our company...)

...we have developed unique ways of collaboration to improve innovative capabilities of the company.
...we are alert to environmental changes and respond to them.
...we are devoted to improving the competitive position of the company in the industry.
...we proactively participate in organizational change to help the company respond to environmental changes.
...we continually innovate to make the knowledge and capabilities of the company unique.
...we continually innovate to rapidly accumulate crucial knowledge for the company.
...we integrate different areas of knowledge to improve innovations in products/services.
...we are devoted to improving recognition of the company name and reputation.

Appendix B: qualitative categories

Categories	Example statements	Differences?
C1: Complaints about leadership and structure	<p><i>"I understand that Agile should help us to improve the current workflow and speed up processes. But when I get the feedback that internal meetings are more important than deadlines, external meetings or external calls, I can no longer actually take it seriously. [...]."</i></p> <p><i>"More leadership in development, less pressure on the individuals."</i></p>	Yes, C1 more frequent in agile teams
C2: Calls for less empowerment	<p><i>"More structure, more guidelines for newbies, less immediate 'empowerment'"</i></p> <p><i>"Implement hierarchy instead of self-organized teams."</i></p>	Yes, C2 more frequent in agile teams
C3: Salary & benefits	<p><i>"Provide more paid time off."</i></p> <p><i>"Fair salary within the teams and cross departmental."</i></p>	No
C4: Career opportunities	<p><i>"There is no real option for a career. You can only do more work without any recognition. This is highly frustrating."</i></p> <p><i>"Opportunities for employees to develop professionally."</i></p>	No
C5: Products & Solutions	<p><i>"Take time to update the platform and improve development processes."</i></p> <p><i>"Develop products instead of clients."</i></p>	No
C6: Communication & collaboration	<p><i>"A more respectful, serious and productive work environment within and between individual departments."</i></p> <p><i>"Everything takes a really long time to get approved or accomplished. There is constantly a sense of back and forth between departments and offices."</i></p>	No
C7: Strategy	<p><i>"A new vision which isn't focused purely on monetary growth, better change management."</i></p> <p><i>"Sharper market orientation (what we should do looking at where the market is going) as opposed to the heavy development capabilities orientation (what we can do based on what we already have with minimal additional effort) now."</i></p>	No