

How Agile Software Development Teams are Led and Lead Themselves – A Literature Review on the Duality of Agile Leadership

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Abstract

Agile software development (ASD) methods are widely applied today as organizations expect to gain flexibility and foster innovation. Since one of the basic problem-solving mechanisms of ASD is a cross-functional, self-organizing, and empowered team at its core, the shift from traditional to ASD approaches requires fundamental changes to management and governance processes and structures. Especially among practitioners, the term “agile leadership” is popular to describe the new demands for formal and informal leaders in an agile environment. In research, the concept is increasingly prevalent and connected to a variety of established leadership theories, but it is not yet consistently conceptualized. This study seeks to integrate existing definitions into a comprehensive model that comprises both a team-internal and team-external perspective of agile leadership. Therefore, a systematic literature review is performed to gather and assess prior literature on how agile leadership materializes in practice. A first iteration of the concept is developed and future research directions are summarized.

Keywords: Agile software development, Leadership, Agile leadership, Agile management, Literature review.

1. Introduction

The advent of *agile software development* (ASD) methodologies in the 1990s has fundamentally changed the organization of team and work processes in various companies over the last three decades. Mostly starting in IT departments around the globe, ASD introduced a customer-centric, feedback-driven software development process based on frequent iterations, openness to changes, and continuous delivery of working software (Highsmith & Cockburn, 2001). This approach has helped organizations adjust to rapidly changing market conditions and customer demands (Dybå & Dingsøy, 2008; Laanti et al., 2011). A crucial precondition to achieving these desired outcomes is that organizations build *cross-functional, self-organizing ASD teams* (Cockburn & Highsmith, 2001).

Establishing ASD teams requires a fundamental change to the way in which work is organized (Moe, Dingsøy, & Dybå, 2009): the subjects of management and leadership are no longer individual employees but teams that function as a unit. These teams are expected to manage themselves, make decisions, and require a high degree of empowerment in doing so (Cockburn & Highsmith, 2001). Those changes are often summarized under the notion of *agile leadership* (e.g., Andrias et al., 2018; Modi & Strode, 2020). Among practitioners, the term is well-known and widely used – for example, popular ASD methodologies such as SAFe (Scaled Agile Framework) use the term agile leadership in their official handbook (Scaled Agile Inc, 2023) and a variety of consultancies offer trainings and certifications on how to become an agile leader. In ASD contexts, management responsibilities no longer necessarily rest with designated people but are shared across hierarchy levels and functions (Moe et al., 2010). This is a significant challenge for both team members and leaders in organizations: a change in behavior is required, but the concept is neither consistently defined in practice nor has it yet been formally conceptualized and explored in research. Two recent literature reviews on agile leadership (Modi & Strode, 2020; Theobald et al., 2020) stress the importance of establishing a strong theoretical foundation of the concept. They highlight that a myriad of terms and constructs are strongly connected to agile leadership but are not used in a consistent manner. Both literature reviews do not yet attempt to create a comprehensive, parsimonious model of agile leadership. Thus, this study seeks to answer the following research question:

RQ: “How have aspects of agile leadership been defined in prior research?”

In the first step, a systematic literature review was performed to identify relevant studies that have covered aspects of the phenomenon of agile leadership. In the second step, the respective definitions of agile leadership have been extracted and analyzed in terms of common characteristics and discrepancies between the applied concepts. This formed the basis for a subsequent aggregation of the relevant components into an initial construct of agile leadership, which incorporates both team-internal and team-external

leadership aspects. Lastly, promising directions for future research endeavors have been identified.

The remainder of this paper is structured as follows. In Section 2, the foundations of ASD and team leadership opposed to traditional leadership theories are recapitulated. Section 3 summarizes how the literature review was performed to answer the research question. In Section 4, concepts that have been associated with agile leadership in prior research are introduced and integrated. Finally, Sections 5 and 6 discuss how the results of the literature review can be used to build an initial comprehensive construct of agile leadership and subsequently refine it.

2. Theoretical Background

2.1. Characteristics of agile software development

The shortcomings of traditional software development (SD) motivated a group of professionals in the 1990s to implement new, more lightweight approaches to developing software. In 2001, they established the term agile to describe the commonalities of these methods and summarized their fundamental beliefs in the Agile Manifesto, consisting of associated values and practices (Beck et al., 2001). As a common theme, the frameworks and practices that were developed aimed to counteract the inflexibility, heaviness, and late availability of finished work that is commonly associated with sequential approaches (Mahadevan et al., 2015). Thus, in ASD (1) individuals and interactions are more important than processes and tools, (2) working software matters more than comprehensive documentation, (3) customer collaboration should be preferred over contract negotiation, and (4) responding to change over following a plan (Beck et al., 2001).

The ultimate goal of ASD is to achieve *agility* in SD processes. Conboy (2009) defines agility as a team's ability to "rapidly or inherently create change, proactively or reactively embrace change, and learn from change" (p. 340). *ASD methods* constitute a means to facilitate agility by providing practices to work in short iterations and receive and implement feedback frequently to establish a constant process of improving the team's product and internal processes (Beck et al., 2001). One of the central preconditions of most ASD methods to establish agility is the introduction of cross-functional teams that comprise all skills that are required to deliver functioning products to customers (Cockburn & Highsmith, 2001). To do so in a timely fashion, the teams require empowerment to define their own working methods, make informed decisions, and

proactively drive their product's development (Highsmith & Cockburn, 2001).

Today, the most popular agile methods – such as Scrum, Kanban, or eXtreme Programming (XP) (e.g., Martin, 1991; Poppendieck & Poppendieck, 2003; Schwaber & Beedle, 2002) – are widely popular in industry and nowadays often the default approach in IT departments and SD projects (Digital.ai, 2023). In addition, ASD approaches are now often applied on a larger scale instead of single, isolated teams. The implementation of ASD teams in large numbers and with many team members while still adhering to the fundamental principles of agility is challenging and promising at the same time (Gerster et al., 2018; Kalenda et al., 2018).

2.2. Agile software development and team leadership

Traditionally, the concept of leadership describes the roles and responsibilities that a formally appointed manager takes on in an organization (Hunt, 2004). Although the term is often used synonymously with the notion of management, leadership is commonly associated with activities such as "initiating change", "giving directions" and "motivating employees" while management is more about the operational aspects of "planning", "organizing" and "controlling" (Hunt, 2004). One of the most dominant concepts of leadership – transformational leadership – stems from the work of Bass (1999) and Avolio (2010) and is part of the full range leadership model, differentiating transformational leadership from its presumed counterparts, transactional and laissez-faire leadership. While laissez-faire describes the absence of leadership and transactional leadership builds on the premise that compliance is achieved through a system of punishments and rewards (Avolio, 2010), transformational leadership is characterized by the so-called "four I's": idealized influence, inspirational motivation, individualized consideration, and intellectual stimulation (Avolio et al., 1991).

These traditional or generic theories of leadership have long dominated the discussion on guidance and influence in the organizational context. Nevertheless, over the past two decades, a variety of new leadership theories have been proposed to cover aspects of leadership that could not be explained using the traditional models, for example authentic, ethical, servant, or pragmatic leadership (Anderson & Sun, 2017). Besides the discussion on how much variance these new leadership theories explain beyond transformational leadership (Hoch et al., 2018), the generic leadership theories have limited potential to help us understand leadership in ASD teams because none of

them explicitly cover team-related aspects of leadership (Knippenberg, 2017). This focus on leading individuals instead of teams is represented in the existing body of knowledge on leadership as reported by DeChurch et al. (2010).

ASD teams rely on a system in which “decentralized independent individuals interact in self-organizing ways” (Highsmith & Cockburn, 2001), which is at odds with the traditional view of leadership with designated leaders. Newer, team-specific approaches to leadership concepts emerged over time that seem more applicable to ASD teams as self-organizing, autonomous units. In his seminal work on team leadership, Knippenberg (2017) highlights the promising approaches of empowering leadership and shared leadership and their advantages in explaining how leaders not only strengthen and encourage team members, but actively turn over decision-making power and responsibilities to teams.

3. Methodology

3.1. Data collection

To gather relevant leadership concepts that have been analyzed in connection with ASD teams, a systematic literature review based on the recommendations of Webster & Watson (2002) and vom Brocke et al. (2015) was performed. Accordingly, the selected search scope and time frame, the keywords and resulting search string, as well as inclusion and exclusion criteria were specified as follows.

The challenge of a literature review on agile leadership lies in the inconsistent wording and breadth of potentially relevant publications. Thus, the search was limited to studies that (a) had a clear focus on ASD teams (instead of cross-functional, empowered, or self-organizing teams in general) and (b) were published in the field of information systems (instead of general business or management research). This review zooms in on agile leadership in software development as this field has matured in implementing ASD methods over the past three decades and oftentimes triggered structural and organizational changes to how leadership is practiced. The search was carried out assisted by the meta-search tool Litsonar (<http://litsonar.com>). The tool supports the selection of keywords, databases, and publications. LitSonar then creates search strings that can be entered in the advanced search field of selected scientific databases. As a publication filter, the 109 journals of the AIS toplist were selected in the first step. In addition, the most important conferences in the information systems field (ICIS, ECIS, AMCIS, PACIS, HICSS) were added manually since research on agile leadership is relatively new and relevant studies are

often presented at those conferences before they are published in the selected journals. To cover all selected publications, the following databases were searched via the generated search strings: EBSCOhost, IEEEExplore, Science Direct, ProQuest, ACM Digital Library, and AISEL. In addition, manual searches for non-covered publications were carried out in several cases. Further, the search results were limited to peer-reviewed studies published between 2000 and 2024.

The search string was iteratively refined to best represent the topic of agile leadership. As the research focus on this topic is often relatively new and scarce, the initial pilot search consisted of the terms *agil** and *leader**. Scanning the results of this search led to an addition of ASD methods to the search string as some studies used the term of the specific practices that were analyzed instead of the general term “agile”. Management as an alternative term to leadership was not selected as the search delivered far too many results because of the prevalence of the term “agile project management”. This resulting search string was used in the process:

(agil OR scrum OR “scaled agile” OR Kanban OR xp OR extreme programming) AND leader**

The search resulted in a total of 359 papers. After screening the abstracts of the papers, 87 papers remained that were further evaluated in the next step. Any remaining papers were downloaded and scanned to evaluate their relevance for defining the term of agile leadership. I did not exclude non-empirical studies from this subset of papers. Many studies only considered leadership as a partial topic of their research and did not specify a definition of how agile leadership is applied in practice. After excluding those studies, only 11 papers remained. In the following, a backward and forward search was performed that led to a total of 18 papers that were analyzed in detail.

3.2. Data analysis

For the data analysis process, the papers were read in full by the main author and information on the following questions was extracted: author, year of publication, title, outlet, research question, method, findings, and relevant theories from leadership research that had been applied. During the analysis, it was noticeable that one part of the studies interpreted the phenomenon of agile leadership as a process that solely happens within the ASD teams, while other either took management personnel outside of the team into consideration as well, or solely analyzed team-external management of ASD teams. This categorization seemed especially interesting since it reflects a new view on leadership as a team-internal process, where team

members take on leadership roles. At the same time, studies that took team-external processes into consideration acknowledged that the reality in which ASD teams operate in an organization seldomly provides a fully autonomous standing regardless of the optimal conditions that should or could exist. Thus, the categorization of team-internal and team-external agile leadership was added to the study overview. In addition, most papers specified the individuals or roles that they considered for potential leaders, such as team members, Scrum Masters, Product Owners, managers, or coaches.

Next, the definitions or concepts that the studies used to describe or analyze agile leadership were gathered and integrated in terms of common themes and remaining discrepancies using a constant comparison approach. An initial concept model for agile leadership was developed based the findings of the literature review.

4. Findings

4.1. Overview of agile leadership concept

Figure 1 depicts the leadership relationships that potentially exist within an ASD team and its environment. This understanding of agile leadership does not position the ASD team outside of or autonomous from an organization, but embedded in existing structures and hierarchies. Not only do team members influence and guide each others, but they are also possibly subjects to leadership from managers of different hierarchy levels – individually or the team as a collective.

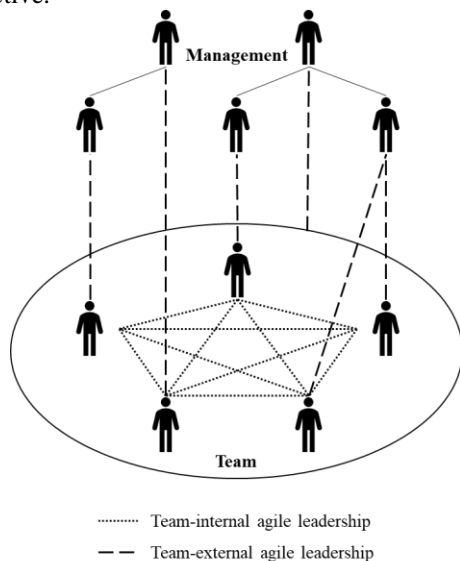


Figure 1. Team-internal and team-external perspective of agile leadership.

In the following, the two categories will be referred to as *team-internal* and *team-external agile leadership*.

Table 1 summarizes the results of the literature review. An 'x' indicates that a paper covers the respective aspect of agile leadership, an '(x)' stands for partial coverage. Overall, five studies exclusively look at team-external agile leadership, eight studies focus on only team-internal agile leadership and five studies analyze both aspects. 12 papers build upon an existing leadership theory, most often self-management (or organization) and shared leadership. Research that examined the role of specific roles defined in ASD frameworks, in particular Scrum Masters and Product Owners, counts towards team-internal agile leadership in this study. This is because employees in these roles work with the other members of the team daily, are usually assigned to a single team, and have very clearly defined responsibilities. Their skill set and capabilities are essential in achieving the cross-functionality of an ASD team that is required to deliver value. Another role that is assessed in several studies is the agile coach. The categorization of those studies is less clear: while many coaches often work very closely with a team, they are mostly in a more advisory capacity, are not responsible for operational tasks, and are sometimes employed by external firms.

Following, I will summarize and integrate definitions of leadership theories applied in prior research for the two facets of agile leadership. In this analysis, I will not define every theory mentioned in Table 1 but instead focus on the most prevalent ones and exclude theories that have been found to not fit the context of agile leadership as well as others in the respective studies.

4.2. Team-internal agile leadership

Research on leading and managing agile teams has focused on team-internal processes for a long time as ASD methodologies by definition highlight the necessity of self-organization and self-leadership (Beck et al., 2001). In addition, ASD practices were particularly applied in small, innovative, and IT-related new product development projects first, often in start-ups or specialized, autonomous subunits before they have become increasingly popular in IT departments of larger, more traditional organizations and even beyond the IT context (BitkomResearch, 2018; Digital.ai, 2023).

Table 1. Definitions of agile leadership in prior research.

Source	Team-internal	Team-external	Specified Leadership Roles	Relevant Leadership Concepts
Hoda et al. (2013)	x	(x)	Team members, Coach	Self-organization
Moe et al. (2015)	x	(x)	Coach (Team Leader), Team members	Self-management Shared leadership
Andrias et al. (2018)	x	x	Team members, Managers	-
Dubinsky & Hazzan (2010)	x	x	Change leader (Team members or managers)	Ad-hoc leadership
Gren & Ralph (2022)	x	x	Scrum Master, Coach, Managers	Self-management Shared leadership
Augustine et al. (2005)		x	Managers	Adaptive leadership
Bäcklander (2019)		x	Coach	Enabling leadership
Bonner (2010)		x	Project managers	-
Geffers et al. (2024)		x	Managers	-
Yang et al. (2009)		x	Project managers	Full range leadership model
Moe, Dingsøy, & Dybå (2009)	x		Scrum Master, Team members	Self-management
Moe et al. (2010)	x		Scrum Master, Team members	Self-management Team leadership
Moe, Dingsøy, & Øyvind (2009)	x		Scrum Master, Product Owner, Team members	Shared leadership
Przybilla et al. (2020)	x		Team members	Self-organization Emergent leadership
Spiegler et al. (2019)	x		Scrum Master, Team members	-
Srivastava & Jain (2017)	x		Scrum Master, Team members	Situational leadership Rotational leadership Shared leadership Expert leadership Super leadership
Spiegler et al. (2020)	x		Scrum Master, Team members	-
Xu & Shen (2018)	x		Scrum Master, Product Owner, Team members	-

The literature review on team-internal agile leadership resulted in three main perspectives: *shared (or rotating) leadership*, *self-management* (i.e. team autonomy or empowerment) and newer concepts such as *adaptive* or *emergent leadership*.

Shared leadership is defined by three characteristics: (1) lateral influence among peers, (2) the occurrence as an emergent team phenomenon, and (3) the dispersion of leadership roles and influences across team members (Zhu et al., 2018). The concept is strongly related to the fundamental characteristics of ASD teams as cross-functional, autonomous units (Cockburn & Highsmith, 2001). A team's desire to plan and manage its own work makes it necessary that traditional management responsibilities lay with team members. Due to the variety of team member skills, functional leadership is organically assigned to the person with the most knowledge in one distinct field.

Shared leadership and *self-management* – the second theme of team-internal agile leadership – are not mutually exclusive but rather build on one another. Leadership cannot be shared or distributed within a team if the team is not allowed or does not have the ability to do so. Nevertheless, self-management does not necessarily result in shared leadership and vice versa since other factors such as the internal and external team environment shape team processes and norms as well (Carson et al., 2007). Another concept that is often referenced in connection with self-management is *team empowerment* (Kirkman & Rosen, 1999). Team empowerment is also linked to shared leadership (as well as self-management), but it is rather a motivational concept than a leadership theory that explains how high levels of a team's perception of its meaningfulness, impact, potency, and autonomy influence task motivation (Carson et al., 2007).

Other concepts such as *emergent* or *adaptive leadership* are the third theme of team-internal agile leadership (e.g., Augustine et al., 2005). These theories help to explain how a state of shared leadership is reached, but they only cover certain parts of the characteristics of shared leadership (Carson et al., 2007). For example, emergent leadership theory is about the transition of a few (mostly one or two) individuals on a team into an unofficial leadership role. Thus, the individuals have lateral influence among peers, but the theory is rather an individualistic concept than a team-based concept and only few, not many, share influence and leadership (Zhu et al., 2018). Consequently, this study argues that including shared leadership in the concept of agile leadership sufficiently explains how team processes function in ASD teams. The inclusion of aspects of newer concepts such as emergent and adaptive leadership does thus not provide substantial additional value.

4.3. Team-external agile leadership

As ASD methodologies gained popularity over the last three decades and following the introduction of scaled agile practices, there are more and more ASD teams in a variety of organizations and functional departments today (Digital.ai, 2023). As a result, those teams are increasingly intertwined with team-external managers and leaders. Since ASD methodologies and frameworks typically focus on team-internal processes and structures, there is no blueprint for how external managers fit into and support the ASD team. To gain a better understanding of team-external agile leadership, research has started to focus on the roles and responsibilities of functional and disciplinary managers in relation to ASD teams over the past years. The analysis of prior research on agile leadership has resulted in a set of five clusters of behaviors regularly associated with team-external agile leadership: (1) providing vision and context, (2) encouraging (team) self-management, (3) fostering team work and conflict resolution, (4) serving others and prioritizing team success, and (5) developing and supporting other leaders (e.g., Andrias et al., 2018; Augustine et al., 2005; Geffers et al., 2024; Gren & Ralph, 2022). While some of those roles and responsibilities are in line with generic leadership approaches such as *transformational leadership* (e.g., “providing vision and context”, or “developing and supporting other leaders”) others build upon the notion of *team leadership* (Knippenberg, 2017) and explicitly go beyond the notion of one or more formal appointed leaders as entities that hold power and may or may not decide to share it – rather, teams are expected to self-manage and leaders support them in developing the capabilities to do so. The distinction

between generic leadership approaches and team-specific leadership approaches is essential to understanding the way in which agile leadership differs from more traditional leadership models.

Transformational leadership and *servant leadership* are two examples of generic leadership approaches that have been considered in prior research on agile leadership. For example, Yang et al. (2009) have found that a transformational leadership approach is connected to ASD teams’ success. Similarly, servant leadership appears to moderately correlate with team effectiveness, especially for formally appointed leaders in ASD teams (Holtzhausen & de Klerk, 2018). These generic leadership approaches – especially positive leadership approaches, such as transformational, ethical or authentic leadership – have dominated the debate on leadership over the past decades. These approaches have regularly been connected to a variety of positive outcomes (e.g., increased employee trust, motivation, satisfaction, and performance) (Hoch et al., 2018). Nevertheless, while generic approaches have the advantage of being applicable to leading both individuals and teams, they cannot address the specific requirements of team leadership (Knippenberg, 2017). That is especially relevant for self-organizing or empowered teams (such as ASD teams), because many tasks that are traditionally carried out by formal managers are now part of the responsibilities of a team (Cooney, 2004).

This is where team-specific leadership approaches come into play. Empowering leadership is one of the central team-specific approaches, focusing on giving team members the skills, opportunities and knowledge to take on leadership responsibilities themselves (Ahearne et al., 2005; Chen et al., 2007). As opposed to positive leadership approaches, empowering leadership seeks to actively shift power away from a designated leader and encourage teams to take on these powers instead (Knippenberg, 2017). In line with team empowerment, which is the intended outcome of empowering leadership, the approach comprises measures to (a) enhance the meaningfulness of work, (b) foster participation in decision-making, (c) express confidence in a team’s high performance, and (d) provide autonomy from bureaucratic constraints (Ahearne et al., 2005). The concept is strongly linked to agile leadership at first glance as ASD teams are described as empowered teams since the advent of ASD methodologies (Beck et al., 2001) and prior research has yet discussed the concept of empowering leadership in connection with ASD (Xu & Shen, 2015, 2016).

In his prior work on team leadership, Knippenberg (2017) has called for further research on the link between and interplay of shared leadership (as a team-internal process) and empowering leadership (as a team-

external process). The context of organizations that apply ASD methodologies on the team levels lends itself to a detailed analysis particularly through the lens of shared and empowering leadership which is why the first version of an agile leadership concept will be heavily influenced by the two aforementioned concepts.

5. Discussion

5.1. Contributions to research

Figure 2 summarizes the concept model that emerges from this study's literature review. Agile leadership is defined as a three-level concept. The first level is named "agile leadership" and the second level comprises the two sub-dimensions of agile leadership, namely "team-internal agile leadership" and "team-external agile leadership". Both team-internal and team-external aspects are required to establish agile leadership simultaneously. ASD teams cannot self-organize and share leadership internally if external management does not actively encourage team-internal organization and decision-making and give up management powers and responsibilities themselves at the same time. Thus, the dimensions are logically combined with an AND-logic. The third level includes indicators for both sub-dimensions. For both team-internal and team-external agile leadership, the set of indicators can vary between samples. As a result, the indicator level is logically combined with an (inclusive) OR-logic.

For team-internal agile leadership, two indicators are included that need to be established for a high level of team-internal agile leadership: (1) "self-management" and (2) "shared leadership". For team-external agile leadership, five indicators have been developed based on empowering leadership. The dimensions have been extended and concretized to better reflect the context of ASD teams and incorporate additional team-external leadership theories that have been linked to agile leadership. For example, 'providing vision and context' is a way of increasing an ASD teams' perception of its meaningfulness by better understanding the organizational environment and its own contribution to the organization's success.

An intensional and an extensional definition of agile leadership has been developed to concretize and limit the understanding of the concept:

- **Intensional definition:** Agile leadership describes how managerial roles and functions are prioritized and distributed in the context of agile software development teams. Agile

leadership covers both team-internal and team-external characteristics.

- **Extensional definition:** The concept of agile leadership only relates to work groups - not individuals - that apply work methods in line with the values and practices specified in the agile manifesto as well as external managers that are functionally or disciplinarily linked to the team.

The concept of agile leadership as described above has not yet been measured in prior research in its entirety. Still, the concept builds upon and combines established instruments, which have been tested for their reliability and validity extensively. In future research endeavors, the measurement instrument should be developed and tested to operationalize agile leadership. This process builds upon existing research as several relevant instruments could be integrated to assess a dual, comprehensive view of agile leadership as a both team-internal and team-external process at the same time.

For team-internal agile leadership, the defined dimensions can be operationalized as follows. First, shared leadership is usually measured via network analysis approaches. For example, network density is often calculated by asking every team member whether they perceive another team member as an individual they rely on for leadership (Carson et al., 2007). This approach is still subject to potential improvements as Zhu et al. (2018) argue that shared leadership relies on both leadership density and decentralization and a suitable operationalization should assess both perspectives. Second, there are established scales to measure self-management in surveys using Likert scales.

For example, Campion et al. (1993) have developed a three-item instrument that is very commonly used and both reliability and validity have been established. The level of team-internal agile leadership should be calculated using a sum score. For team-external agile leadership, the creation of a measurement instrument is more complex. Since existing constructs neither span all necessary dimensions to evaluate team-external agile leadership nor are specific enough for the ASD team context, a revised instrument should be developed. In addition, the instrument's reliability and validity need to be established using established scale development processes. The 12-item instrument by Zhang & Bartol (2010) to measure empowering leadership can serve as a starting point for a more refined version that can be assessed in a survey using a Likert scale. The level of team-external agile leadership should be calculated using a sum score.

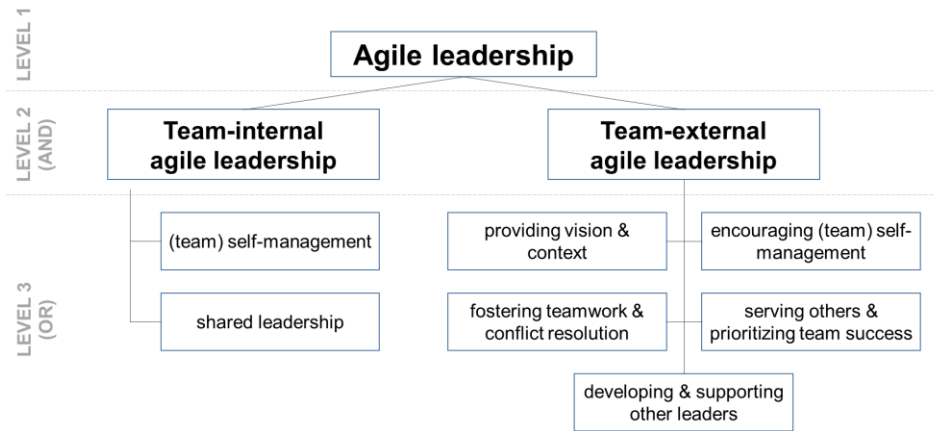


Figure 2. Concept model of agile leadership.

5.2. Contributions to practice

For organizations that are currently in the process of implementing ASD methods or have done so in the past, this study primarily serves as a means to categorize agile leadership into two main themes that both shape the course of an agile transformation. Agile leadership is a set of attitudes and behaviors that is relevant for both team-internal processes and traditional management positions. A good understanding of how teamwork processes as well as management support contribute to the success of ASD teams is essential for organizations to master a transformation. As stated before, the notion of agile leadership often refers to how managers need to adapt their style of leadership when working with agile teams. Nonetheless, this study has concluded that agile leadership needs to be practiced both internally and externally for ASD teams. Especially in training resources and curriculums, this finding needs to be translated into practice. It is not only required to teach managers an empowering, hands-off leadership approach, but simultaneously, teams need to be explicitly told that self-management is required from them and they need training to be able to implement those requirements into their work processes. Further, supporting organizational processes – e.g., planning, budgeting, or HR-related functions such as performance management – often require changes to facilitate the new approaches to decision-making and distribution of power that implementing agile leadership entails.

In addition, this study is a first step in designing a measurement instrument to assess agile leadership on a team level. Once this instrument is refined and tested, agile leadership could be measured as a feature of cultural or structural change in agile maturity models that organizations use to identify strengths and

weaknesses in their approach to introduce ASD teams and shape their transformation. Establishing such an instrument and respective performance indicators also starts a conversation within an organization on how much agile leadership and thereby empowerment and self-management is actually desired.

5.3. Limitations

This study has certain limitations. First, since the literature review has strictly focused on publications that have a clear focus on information systems, it does not incorporate the extensive body of knowledge on empowering leadership in other contexts. While empowered teams do not share all characteristics of ASD teams, they certainly overlap to a large degree. Future research should analyze the findings of studies on empowering leadership and team empowerment in general in more detail so that research on ASD teams can benefit from those insights. Empowering leadership has been covered in the course of this study, but only as it was used in existing research on ASD teams. Second, as especially team-internal leadership is often only a small part of studies on ASD teams in general, those findings may have not been considered in the course of this literature review. Third, there are currently several unfinished research-in-progress papers from conferences over the last years that are not yet published as completed research. Those studies should be considered for the concept of agile leadership as well when published.

6. Conclusion

Our understanding of the concept of leadership specific to teams that use ASD methods is still very limited. As ASD methods are more and more prevalent

in a variety of contexts today, the need to understand how such teams can profit from effective leadership is continuously increasing. As a first step in this process, this study was performed to aggregate findings from a growing body of research on ASD teams in how those team are led and lead themselves in practice. A two-fold model of agile leadership was developed based on those insights, that conceptualizes agile leadership as a combination of both team-internal and team-external perspectives. In a next step, research on related topics from other disciplines could be integrated if possible and a measurement instrument to assess agile leadership should be developed.

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