Please quote as: Eilers, K.; Peters, C; Leimeister, J. M. (2022). Why the agile mindset matters. Technological Forecasting and Social Change, 179, 1-14.

Technological Forecasting & Social Change 179 (2022) 121650

Contents lists available at ScienceDirect

Technological Forecasting & Social Change

journal homepage: www.elsevier.com/locate/techfore

Why the agile mindset matters

Karen Eilers [a,*], Christoph Peters [a], Jan Marco Leimeister [a]

[a] Institute of Information Management, St. Gallen, Schweiz, Switzerland

ARTICLE INFO

Keywords:
Agile mindset
Organizational performance
Strategic agility
Digitalization

ABSTRACT

Volatility, uncertainty, complexity, and ambiguity (VUCA) are drivers in today's business world. To perform amid this accelerated change and the digitalization progress, organizations are implementing agility. However, such an implementation does not happen without stumbling blocks and some fail. One reason for this is actors' agile mindset (AM), which is necessary to deal succefully within a VUCA environment. Knowledge of the AM is in its infancy and conceptualization and measuring tools for it are lacking. Furthermore, the relation of the AM in terms of strategic agility and performance is still unclear. Our study aims to close these gaps. We examine AM through 15 interviews and a survey ($N = 449$) to predict strategic agility and performance. As a result, we conceptualize AM as an attitude that comprises four dimensions: attitude towards 1) learning spirit, 2) collaborative exchange, 3) empowered self-guidance, and 4) customer co-creation. Furthermore, we describe how actors with an AM deal with new technologies. We found that AM affects organizational performance mediated by strategic agility. These findings contribute to the agility and management research by providing a conceptualization and measuring instrument for AM. Furthermore, its relevance for strategic agility is explained and its relationship with organizational performance outlined.

1. Introduction

The business environment is becoming increasingly characterized by volatility, uncertainty, complexity, and ambiguity (VUCA; Bennett and Lemoine, 2014). To deal with this situation, an increasing number of organizations are implementing agility in their way of working (Crocitto and Youssef, 2003; Alt et al., 2020). Agility, which becomes a popular concept in IT, is now one of the top 10 topics for organizations and managers (Kappelman et al., 2017) Therefore, it keeps finding its way onto organizations' agendas (Alt et al., 2020). While the need for agility in practice has increased, the construct has also gained increasing research attention (Abrahamsson et al., 2009; Lee and Xia, 2010; Tallon et al., 2019; Walter, 2020; Debellis et al., 2021; Shams et al., 2021).

Several decades of research about agility offers different perspectives about this construct. Overall, it can be characterized as "sensing and responding to change" (Tallon et al., 2019, p. 220). A large amount of literature focuses on agility on a project (Dikert et al., 2016), process (Tallon, 2008), or organizational level (Tallon and Pinsonneault, 2011). Here, the definitions focus on the adaptation of structural aspects. Chen et al. (2014) defined organizational agility as the "extent to which firms can easily and quickly retool their business processes to adapt to the market environment" (Tallon, 2008; Chen et al., 2014, p. 328). Today, an increasing number of researchers focus on the internal aspects and human side of agility (Breu et al., 2002; Sherehiy and Karwowski, 2014; Muduli, 2017; Peters et al., 2020, 2021). In our paper, we focus on strategic agility, which emphasizes how fast and easily organizations change their strategy to gain value and react to changes in market environment, which includes structural as well as internal human aspects (Tallon and Pinsonneault, 2011; Cunha et al., 2020).

Several studies offer positive outcomes on different kinds of agility, such as firm performance (Chen et al., 2014), job satisfaction (Tripp et al., 2016), motivation (McHugh et al., 2011), increased flexibility, speed in product design and manufacturing (Sharifi and Zhang, 1999; Sherehiy et al., 2007), competency and learning (Sharifi and Zhang, 1999), better customer service, and quality improvement (Hopp and Oyen, 2004).

Previous researchers have stated that digitalization and agility go hand in hand (Sambamurthy et al., 2003). While some insights argue that agility promotes digitalization (Akhtar et al., 2018; Chan et al., 2019) through the continued development and adaption of new technology; other findings suggest that digitalization promotes agility (Lucas Jr and Goh, 2009; Li et al., 2021; Troise et al., 2022).

Abbreviations: AM, Agile Mindset; VUCA, Volatility, uncertainty, complexity, and ambiguity.

* Corresponding author.
E-mail address: karen.eilers@unisg.ch (K. Eilers).

https://doi.org/10.1016/j.techfore.2022.121650
Received 29 April 2021; Received in revised form 26 March 2022; Accepted 28 March 2022
Available online 6 April 2022

While organizations are interested in implementing agility, it does not happen without stumbling blocks and some organizations fail poorly. Besides changes in external structures and processes, as well actors in an organization are relevant determinants for agility (Doz and Kosonen, 2010; Hinings et al., 2018; Morton et al., 2018; Eden et al., 2019; Cetindamar Kozanoglu and Abedin, 2020).

While external structures and frameworks such as Scrum or Kanban (Dybå and Dingsøyr, 2008) have often been under investigation and put into practice to improve strategic direction (Highsmith, 2002; Nerur et al., 2005; Abrahamsson et al., 2009; Duka, 2012; Tallon et al., 2019), actors' internal structures (e.g. beliefs, attitudes, or dispositions) are often major obstacles for implementing agility (Dikert et al., 2016; Duka, 2012; Sherehiy et al., 2007). The 'people factor' in agility is highlighted in the Agile Manifesto (Beck et al., 2001), which is the primary basis for agile software development with its value of "individuals and interactions over processes and tools" (Beck et al., 2001). Besides, several authors, including Coyle et al. (2010) as well as Cockburn and Highsmith (2001), have pointed out that actors are an essential success factor for agility. Furthermore, earlier work has emphasized the significance of an agile mindset (AM) for effective teamwork (Miler and Gaida, 2019), agile transformation (Eilers et al., 2021), and successful software projects (Measey et al., 2015; Dikert et al., 2016; Fuchs and Hess, 2018). Thus, it is an essential construct in information systems (IS) research, which is becoming increasingly prevalent. Practitioners have further stated that agility is not a methodological approach but essentially a mindset (Moreira, 2013; Denning, 2016). Thus, the "agile mindset is more important than any specific agile management methodology, process, system, platform, or organizational structure" (Denning, 2016, p. 13).

Furthermore, even though the relevance of strategic agility and AM is straightforward, measuring agility on different levels still lacks empirical evidence (Millar et al., 2018; Morton et al., 2018; Škare and Soriano, 2021). A comprehensive conceptualization of AM as the basis for developing a measurement instrument is missing. Along with that, it remains unclear how actors with an AM deal with digital disruption to improve organizational performance. In addition, there is a lack of careful consideration of the influence of the actor's AM on strategic agility. As Eden et al., p. 1) clearly stated: "Digital transformation requires workforce transformation". It is therefore necessary to begin at the actor's level and consider these effects at the organizational level. Increased strategic agility, as a success factor for organizations in the complex and digitally driven VUCA environment, should in turn increase organizations' performance. We want to shed light on this research gap by conceptualizing AM and explain the value-oriented behavior of actors with a high degree of AM, which tends to occur in the context of digitalization. In a second step we develop a measuring instrument to capture AM and show how it relates to organizational performance.

To achieve this goal, and as outlined in this paper's theoretical background, we have reviewed the literature for insights into agile actors dealing with digitalization and for previous conceptualizations and findings regarding AM. To gain an in-depth understanding, we have focused on 15 interviews with experts of agile work, including different roles that were relevant in the agile working context. Based on these insights, we have developed and tested a survey instrument for measuring AM. Our paper examines a quantitative research model based on sociotechnical theory (Trist, 1981; Pasmore, 1988) which connects the AM of actors, strategic agility, and organizational performance. Furthermore, to consider our research model, we have used a survey to test the relationship among AM, strategic agility, and organizational performance. These findings allow us to answer the following research questions:

RQ1: What is an agile mindset?

RQ2: How can agile mindset be measured?

RQ3: What is the relationship of agile mindset to organizational performance?

An important scientific and practical contribution is anticipated with this paper. A valid conceptualization as well as a measuring instrument would offer practitioners and researchers an opportunity to gain in-depth understanding of AM and thereby contribute to theory. These would enable them to ascertain the status quo and evaluate further means to promote AM. This could lead to more successful strategic agility and contribute to our knowledge of current technological and organizational threats facing IS and practitioners (Straub and Ang, 2011).

Having a conceptualization of and instrument to measure AM would support theory development in research on the management of digitalization and agility at the same time. Our instrument to measure AM can be used as a springboard for theoretically motivated studies that enable researchers to develop further approaches for improving agility in this emerging research area. Executives will profit from our instrument and from knowing the connection between AM, strategic agility, and organizational performance. This would enable them to ascertain the extent of their employees' AM, select impactful actions for promoting AM, and engage people in new agile projects to promote strategic agility in their organization.

2. Theoretical background

2.1. Dealing with digital technologies for strategic agility

Strategic agility refers to organizations' capability to survive in a dynamic market environment (Morton et al., 2018; Shams et al., 2021). It can be defined as "how a firm could remain flexible and quickly adapt to new ideas, technologies, socioeconomic aspects, host countries' and host stakeholders' norms and values" (Shams et al., 2021, p. 2). It therefore encapsulates being flexible without losing efficiency (Bamel and Bamel, 2018; Debellis et al., 2021; Shams et al., 2021). Three key capabilities of strategic agility are provided in the current literature: strategic sensitivity, resource fluidity, and leadership unity (Doz and Kosonen, 2010; Morton et al., 2018; Debellis et al., 2021). Strategic sensitivity describes "the sharpness of perception of, and the intensity of awareness and attention to, strategic developments" (Doz and Kosonen, 2010, p. 371) while resource fluidity provides an opportunity to "reconfigure capabilities and redeploy resources rapidly" (Doz and Kosonen, 2010, p. 371). Lastly, leadership unity is the "ability of the top team to make bold, fast decisions, without being bogged down in top-level 'win-lose' politics" (Doz and Kosonen, 2010, p. 371).

For strategic agility, the actors are in the driver's seat, and so more and more researchers are taking a deeper look at them and their roles, teams, and culture in that context (Doz and Kosonen, 2010; Morton et al., 2018; Arokodare et al., 2019). Here, the focus is on their skills, competence, attitude, interactions, and collaborations in networks with customers, colleagues, and wider stakeholders. In a changing and technologically driven environment, the people involved require a new mindset that leads to agile ways of acting and thus ensures and promotes an organization's performance (Cunha et al., 2020).

As several researchers have already indicated, agile and digital transformation seems to be interrelated (Sambamurthy et al., 2003). Thus, strategic agility can promote the development and implementation of new digital business models and novel technology, whereby digital progress can increase the impact of agility (Lucas Jr and Goh, 2009; Doz and Kosonen, 2010; Akhtar et al., 2018; Chan et al., 2019; Troise et al., 2022). Actors within an organization play a central role in pushing both digitalization and agility forward (Eden et al., 2019; Li et al., 2021).

So far, there is limited knowledge of how actors deal with digital innovation to increase strategic agility, and there is a particular scarcity of insights into their internal structures, such as their mindset and how they should handle disruptive change. As Morton et al. (2018, p. 94) stated: "There is a need to provide specific guidance at lower, more discrete levels of analysis," and "while existing literature produces

insights for organizations to achieve strategic agility, the role that key individuals play in the strategic agility process is under-researched."

Technological change always accompanies organizational change that affects actors (Markus, 2004). In her "technochange" management approach, Markus (2004) recommended iterative prototyping along with organizational changes: "The essential characteristic of the technochange prototyping approach is that each phase involves both new IT functionality and related organizational changes, such as redesigned business processes, new performance metrics, and training" (Markus, 2004, p. 4).

Further findings on how actors should deal with new technology to support strategic agility can be found in the research work of Morton et al. (2018) as well as Doz and Kosonen (2010). Both have focused on IT leaders and how their action promotes strategic agility by developing an agenda showing the steps and practices that a leader can engage to build and maintain strategic agility. They should: engage in practices that focus on self-development, improvement of business knowledge, and awareness of relevant environments. They are team players that facilitate exchange among the board, enabling communication and collaboration throughout the organization by using their knowledge of positioning technologies for strategic gain (Morton et al., 2018, pp. 109–110).

Fink and Neumann (2007) outlined in their study how IT personnel's capabilities (technical, behavioral, and business capabilities) influence IT infrastructure capability, thus leading to IT-dependent strategic agility. They were able to confirm that technical and behavioral capabilities each have a significant effect on IT infrastructure capability, and so influence strategic agility. Close to that, Panda and Rath (2017) showed in their quantitative research model how human IT capabilities affect organizations' sensing and responding agility in a positive way.

Miller et al. (2018) provided challenges and offered recommendations for how managers should deal with the VUCA environment. They recommended that they stay pretty close to customers while continuously experimenting and learning.

Warner and Wäger (2019) built a process model for developing agility capabilities in digital transformation, identifying mindset as being a "digital sensing" component and showing that strategic agility could be assigned to the "digital seizing" cluster. Furthermore it is relevant to address actors' fear of being replaced by digital technology (Tabrizi et al., 2019). Holbeche (2019) reported that "people practices" must change to ready organizations for the digital future. Such practices include a new "way of agile thinking" and "agile strategizing" as characteristics of a resilient and agile culture.

Superficial insights exist concerning how actors currently deal with new technology for strategic agility, leading to the relevance of the AM also emerging. However, it is apparent that conceptualizations of the AM are flipping and are therefore not based on a common theoretical foundation. The impact of actors' AM in relation to strategic agility, digitalization, and organizational performance, however, has not received deeper consideration in research to date.

In actual fact, AM appears to be relevant for both strategic agility and digitalization "if people lack the right mindset to change and the current organizational practices are flawed, DT [digital transformation] will simply magnify those flaws" (Tabrizi et al., 2019). Insights into actors' AM and their influence in digitalization would help organizations to be more agile by encouraging more agile actors to deal with digital disruption.

2.2. Conceptualizations of the agile mindset

So far, AM has had limited scientific examination. While much practical literature deals with AM (Broza, 2012; Moreira, 2013; McDonald, 2015; Measey et al., 2015; Cannon, 2017), scientific findings are still rare. In the practitioner literature, reference is often made to living with agile values and principles (Moreira, 2013; Peters et al., 2019) that are documented in the Agile Manifesto (Beck et al., 2001). However, as Mordi and Schoop (2020) have already noted, this definition only serves to a limited extent for a clear conceptualization of AM. While it appears to overlap with AM, the Agile Manifesto is tailored to software development and does not refer specifically to it.

Previous theory that focused on making AM more tangible can be seen in the work of Denning (2016), Miler and Gaida (2019), Mordi and Schoop (2020), Ozkan et al. (2020), Senapathi and Srinivasan (2013), and Van Manen and Van Vliet (2014). These primarily used qualitative studies and literature; of these, only one quantitative study (Miler and Gaida, 2019), which mixed attributes ranked by the participants, can be identified. An overview of the respective approaches is provided in Table 1.

Senapathi and Srinivasan (2013) examined critical factors for sustained agile usage in their literature review. By conducting a literature analysis, they identified nine factors: compatibility, relative advantage, management support, methodology champion, attitude, motivation, team composition, team empowerment, training, agile mindset, technical competence, agile engineering practices, documentation, and tool support. These mostly social or human-related factors also included "attitude" and "agile mindset" as specific attitude. To define AM, they used the practitioner definition of Rising (2011) and included the two aspects "team spirit" and "team beliefs." The resulting definition at the team level points to the general property "attitude." However, the derivation of the conceptual theme remains unclear, as the two researchers added two non-distinct aspects to an existing practitioner definition. A specification of the correlations of AM and its dimensions is missing at that point, but this would be helpful for model specification and understanding the nature of the AM construct.

AM also emerged in the research of Van Manen and Van Vliet (2014) as a critical factor for scaling agile methods for more organizational agility. In their case study of two companies they were able to identify three facets of AM at the organizational level: "collaboration," "continuous improvement," and "trust" (van Manen and van Vliet, 2014). While they described these dimensions carefully at the organizational level, both AM's general properties and how the dimensions relate to the focal construct remain unclear. Here, we need to know more about the nature of AM's dimensions to develop a scale based on this conceptualization.

In his publication, Denning (2016) reported the results of a learning consortium including several firms (e.g., Microsoft, Riot Games) that wished to learn from each other to become more agile. In addition to several use cases and outcomes of agile approaches, they summarized three main findings: 1.) "agile is primarily a mindset," 2.) "agile needs strong inspirational leadership," and 3.) "big, old firms have been able to change" (Denning, 2016, p. 12). He embedded AM as part of 'being agile' (in contrast to 'doing agile') (see also Eilers et al., 2020) and described AM with a list of seven characteristics including communication, attitude, coordination, leadership, work design, goals, and team composition. This definition is thus very broad and encompasses far more than just an employee's individual cognitive processes. In addition to the general properties, a consistent level is missing because the focal construct and interaction between the single characteristics are still unclear. To fulfill criteria for conceptualization, according to Wacker (2004) we need to know more about the nature of the construct. The operational wording and summative listing contradict the criteria for conceptualizations and can thus easily lead to confusion.

Based on reviewing practitioner literature and five interviews, Miler and Gaida (2019) identified 70 elements of an AM. Among these, 26 were rated as particularly relevant for team performance by 52 agile practitioners. The most relevant elements were: "searching for a solution to the problem instead of finding the guilty," "being motivated," "helping each other," "mutual listening," and "focus on achieving common goal" (Miler and Gaida, 2019, p. 848). The researchers pointed out the relevance of a "specific attitude toward the team and other person" (Miler and Gaida, 2019, p. 848) and therefore provided a general property. However, this was not compatible across all the listed

Table 1
Overview of previous conceptualization of the agile mindset.

Source	Used definition of the agile mindset	Level of definition	Research method
Ozkan et al. (2020)	"Effective agile individuals, teams and organizations require a particular attitude, way of thinking and behavior so called as agile mindset, beyond the given set of procedures, techniques and rituals" (Miler and Gaida, 2019, in Ozkan et al., 2020, p. 721)	Individual, team, and organizational	- Literature review - Two expert interviews for evaluation
Mordi and Schoop (2020)	"Agile mindset is a mindset based on the values and principles of the agile manifesto, whose main characteristics are trust, responsibility and ownership, continuous improvement, a willingness to learn, openness and a willingness to continually adapt and grow. It is underpinned by specific personal attributes on the individual level and an enabling environment on the organizational level, which allows autonomy of people and teams, managing uncertainty and a focus on customer value, with the goal of achieving a state of being agile instead of merely doing agile." (p. 9)	Individual and organizational	- Literature review (scientific and practitioner literature) - Twelve semi-structured interviews with a practitioner - Five unstructured interviews with practitioners
Miler and Gaida (2019)	"Agile team requires not only a given set of procedures, techniques and rituals, but, above all, a particular attitude, way of thinking and behavior of both the individuals and the entire team – a so called 'agile mindset'." (p. 841) "Specific attitude towards the team and other people as well as proactive and open mind of the individuals." (p. 848)	Individual and team	- Literature review - Five interviews - Evaluation with 52 practitioners
Denning (2016)	"Agile was seen as a different way of understanding and acting in the world. The successful firms were 'being agile,' not merely 'doing agile' within their existing management framework." (p. 13)	Individual, team, organizational, and processes	- Case study
Van Manen and Van Vliet (2014)	"In this analysis three issues emerged, which form an important part of the agile mindset. These are 'collaboration,' 'trust,' and 'continuous improvement.' In other words, if there is no collaboration, trust or wish for continuous improvement, then there exists no agile mindset within an organization." (p. 54)	Organizational	- Multiple case study with two companies
Senapathi and Srinivasan (2013)	"An attitude that equates failure and problems with opportunities for learning, a belief that we can all improve over time that our abilities are not fixed but evolve with effort" (Rising, 2011, in Senapathi and Srinivasan, 2013, p. 122)	Team	- Literature review

elements, among which "abilities" and "behaviors" were also included. While Miler and Gaida (2019) clearly stated that they had only described the elements of an AM, we need to know more about how these elements develop it and how they are connected with the focal construct (the AM).

In their publication, Mordi and Schoop (2020) examined practitioners and the academic literature and conducted 17 semi-structured and unstructured interviews to make AM comprehensible. They picked up ten elements, including "continuous improvement," "autonomy of people and teams," and "personal attitudes," and built a comprehensive definition of AM. As a general property, the researchers chose "mindset" based on its dictionary definition. This approach was contradicted by Wacker (2004) in his recommendations. An AM's elements seemed to alternate between the organizational and individual level. The definition gave a broad overview of the connected aspects and overlaps of an AM. It was comprehensive, due to which it lost the specificity that is needed for scale development.

As far as we know, the most recent scientific study on understanding AM is by Ozkan et al. (2020). For a definition, they used the work of Miler and Gaida (2019) and derived agile principles from agile practices that play into an AM. These 105 principles relate to different levels (individual, team, organizational) with various general properties such as work design, behavior, and attitude. They are clustered in 32 categories that can be sorted into people-relevant and process-relevant principles. The former include customer centric, quality, and self-organizing principles, while the latter include risk-driven, value, and design principles. The authors then evaluated their results through two expert interviews. While the scholars focused on the definition of Miler and Gaida (2019) they even extended their theory and contribution by sorting them into process- and people-relevant elements of AM as well as into specific agile methodologies. They used the "principles" as general properties. As the research from before the definition is still very broad and alternates among several levels, it should be more focused for scale development. Furthermore, it should be investigated how these elements are connected to each other.

To sum up, in the previous theory on conceptualizing the AM, there are several levels and dimensions, and clear overlaps of these, including openness, collaboration, and target or customer focus. Some definitions still show ambiguities in their conceptualization; unclear conceptualizations can reveal several difficulties. These include confusion due to a missing frame of reference, misinterpretation of indicators, and consideration of misinterpreted connections with other constructs such

as AM (Wacker, 2004; MacKenzie et al., 2011). To avoid these difficulties and to consider the role of AM for organizational performance in the digitally driven VUCA environment, a comprehensive AM conceptualization needs to be developed. Furthermore, it should be investigated how actors with an AM deal with new technology. Our first research question, *"What is an agile mindset?"* addresses this research gap.

Furthermore, besides Miler and Gaida (2019), quantitative studies are lacking. As far as we know, there is no published instrument to measure AM. This is the second research gap addressed in our paper and focuses on in our second research question, *"How can agile mindset be measured?"* In our study, we defined AM on the individual level. Due to the digitally driven VUCA world, where strategic agility is needed for success (Martínez-Climent et al., 2019; Trost, 2020), our study provides a theoretical and practical basis for dealing with AM. By offering a clear conceptualization of AM and a measurement tool to capture its status quo, AM's connection with organizational performance can be investigated, and this is further described in the next section.

2.3. Agility as a socio-technical system

Continuous change that demands increased strategic agility affects an organization's entire work system. Here, the sociotechnical system theory (Trist, 1981) offers an approach to action mechanism (Crocitto and Youssef, 2003). In the context of IS research, the model of Pasmore (1988) and Trist (1981) shows a strong presence. This is divided into 1) the social system with the affected people/employees and the organization itself and 2) the technical system, including tasks and technology (Winter et al., 2014). These aspects are inevitably linked and influence each other. For the successful implementation or alteration of work systems that specifically address their sociotechnical and person-oriented characteristics, the systematic and collaborative design of these systems plays a crucial role (Simmert et al., 2019; Peters, 2021) and lay the basis for realizing successful business models (Peters et al., 2015) as well as for scaling such systems despite their person-orientation (Kleinschmidt et al., 2019). Overall, improvements in this work system are aimed at improving performance in terms of human and organizational goals. Within the framework of IS research, the interrelated elements of sociotechnical systems have been examined over several levels (Winter et al., 2014). Based on this, it does not seem implausible that the individual perspective of the actors in the work system influences organizational events. As Wynne (1977) expressed, the actor and his or her implicit theories play a crucial role in the extent to which successful change strategies are implemented. Agility influences all aspects of the work system. It demands a new mindset and corresponding new behaviors for employees to carry out the changed task design and implementation of agile methods (Crocitto and Youssef, 2003; Dikert et al., 2016). Furthermore, new technology and digital transformation often go hand in hand with agile approaches (Sambamurthy et al., 2003).

However, forcefully implementing strategic agility in an organization that can face a complex, uncertain, and digitally driven environment is not always successful and can end in failure (Digital.ai, 2018). reasons for this, along with the sociotechnical theory, can rather be found in the social element than the technical element (Sherehiy et al., 2007; Duka, 2012; Gandomani et al., 2014; Dikert et al., 2016; Morton et al., 2018). For this reason, our research focuses on the actors and their impact at the organizational level (Morton et al., 2018). So far, a quantitative study regarding AM and its role in strategic agility is missing. The first insights into CEOs' individual cognitive capability for strategic agility have just been provided (Ferraris et al., 2021). However, knowledge about individual actors' agile mindset impact could be crucial for executives responsible for implementing strategic agility and increase organizational performance. We focused on this research gap in our third research question, *"What is the relationship of agile mindset with organizational performance?"*

3. Methodology

To answer our research questions, we have followed recommendations of DeVellis (2017) as well as Wacker (2004) and MacKenzie et al. (2011) for validating new constructs and new scales. They recommended a combination of qualitative and quantitative approaches. Accordingly, we have used this combination and worked with recommended methods.

3.1. Qualitative survey for conceptualizing agile mindset (RQ1)

Conceptual definitions of constructs pose one of the biggest concerns in information systems and behavioral research on the validation processes (MacKenzie et al., 2011). Some conceptualizations do not explain the nature (i.e., "type of property the construct represents" (MacKenzie et al., 2011, p. 299); e.g., an attitude), conceptual domain (i.e., entity of a construct, e.g., a person), and theme (i.e. "necessary and sufficient attributes/characteristics" (MacKenzie et al., 2011, p. 299). Also, vague or ambiguous language in the definition leads to confusion (Wacker, 2004).

Based on a clear conceptualization, a specific investigation of a construct is possible. The AM becomes ascertainable and can then be integrated into a network with other constructs (nomological network). These steps serve to apply the construct in practice in a targeted manner (Nunnaly and Bernstein, 1994; Wacker, 2004; Worthington and Whittaker, 2006; MacKenzie et al., 2011). Inappropriate definitions are "ambiguous, vague, and unclear, resulting in these concepts leading to a variety of measures" (Wacker, 2004, p. 629). Accordingly, the following three problems can result from inappropriate conceptualizations: 1) the construct's frame of reference can be unclear and confusing, 2) the indicators can be flawed, and 3) the relationships between the construct and other constructs can be incorrect (MacKenzie et al., 2011, p. 299). Since there are inherent weaknesses in AM's existing conceptualizations that could lead to errors in further investigation with other constructs, a new comprehensive conceptualization of it must be conducted. After examining the existing scientific literature, semi-structured expert interviews were conducted in a subsequent step, representing a relevant source of information for new conceptualizations (MacKenzie et al., 2011). The transcribed interviews were analyzed using Gioia's approach to capture the new construct (Gioia et al., 2013). This procedure is widely considered to produce rigorous findings and enable the identification of patterns and connections (Gioia et al., 2013).

3.1.1. Sample

The sample represents a comprehensive compilation of individuals from different hierarchical levels and agile roles, including senior managers, agile coaches, trainers, developers, and scrum masters. All interview partners had an average of over eleven years' experience in agile work (at least three years). Due to the broad span of experience, several roles had often been occupied by one individual, which allowed a more comprehensive data picture to be generated. We used a combination of theoretical and snowball sampling to select interview participants. This allowed us to identify certain actors from theory (scrum masters, product owners, senior managers, developers, trainers/coaches) who had made a significant contribution to the successful implementation of agility and who understood the agile mindset. To this end, we approached organizations that were particularly progressive in their agile work and selected interview participants who already had a wealth of experience with it. In turn, we asked them to recommend other interview partners who can contribute to the research topic. An overview of the sample can be seen in Table 2.

3.1.2. Data collection and analysis

After carefully considering previous theories on AM and capabilities for strategic agility, we conducted 15 semi-structured interviews with agile work experts between March 27 and April 23, 2020. The interview

Table 2
Overview of the interview sample.

No	Age (Gender)	Role	Experience
I1	38 (m)	Senior manager	3 years
I2	38 (m)	Senior manager	16 years
I3	57 (m)	Senior manager	10 years
I4	41 (m)	Agile coach, trainer (earlier software developer)	12 years
I5	38 (m)	Agile coach (earlier software developer)	15 years
I6	42 (m)	Product owner, stakeholder (earlier developer)	10 years
I7	42 (m)	Scrum master (earlier developer)	11 years
I8	44 (m)	Scrum master	12 years
I9	35 (f)	Scrum master and trainer	5 years
I10	55 (m)	Senior manager, product owner	30 years
I11	31 (m)	IT consultant (earlier developer)	8 years
I12	52 (m)	Top manager, scrum trainer (earlier developer)	19 years
I13	38 (m)	Scrum master	8 years
I14	46 (f)	Senior manager	4 years
I15	57 (f)	Senior manager, trainer	16 years

guide was developed in straightforward and familiar language (Potter and Hepburn, 2005; Denzin and Lincoln, 2011) and checked by two methodological experts and two professional experts (at least four years' experience in agile work). The interviews lasted about one hour each. At the end of all the interviews, theoretical saturation was achieved (Flick, 2013). To ensure the credibility of the data collected in the interviews, the interviewees were faced in the opening phase with general questions about agility to assess their experience and knowledge of agile work (Eisenhardt and Graebner, 2007). The interviews were recorded and transcribed verbatim to improve the accuracy of the analyses. Two interviewers were present during each interview to avoid subjective bias and thus ensure the reliability of the interview content. The analyses were conducted using MAXQDA software. For analysis, we used the Gioia approach (Gioia et al., 2013), an inductive procedure for generating explanations and theories about relevant phenomena that have undergone limited research. While "advances in knowledge that are too strongly rooted in what we already know delimit what we can know" (Gioia et al., 2013, p. 15) parallel cross-checking with existing literature and theory can take place as data emerge (Alvesson and Kärreman, 2007). The procedure was divided into two main steps. In the first step, the interview transcripts were processed through open coding (Strauss and Corbin, 1998) to work out the interviewees' understanding of AM. The variety of codes were subsequently clustered into so-called first order concepts by categorizing them according to commonalities and differences. In the second step, the first order concepts were abstracted to second order themes. As Gioia et al. (2013, p. 20) stated, "We are now firmly in the theoretical realm, asking whether the emerging themes suggest concepts that might help us describe and explain the phenomena we are observing"; if a manageable set of second order themes exists, these themes can then be aggregated in the construct (Gioia et al., 2013). To do so, we intensively discussed the clustering with two IS researchers to assess the distinctiveness of the dimensions and restrict the domain of the construct (MacKenzie et al., 2011). Related literature on the four dimensions was carefully examined (see Fig. 2 for the final data structure according to the Gioia approach). We therefore used the three key capabilities of strategic agility according to Doz and Kosonen (2010) as well as Morton et al. (2018) as a reference frame without delaminating for new theory knowledge (Alvesson and Kärreman, 2007; Gioia et al., 2013) and discussed the agile mindset in regard to those key capabilities.

3.2. Quantitative survey for developing a measurement tool for agile mindset (RQ2)

As far as we know, there is currently no measure to capture AM. To consider AM and its relationship to other constructs, we developed a scale according to the construct mixology approach of Newmann et al. (2016). Construct mixology is a practice for "developing new constructs by combining elements of older constructs" (Newman et al., 2016, p. 945) that has been used frequently in organizational and human resources science. Among other things, the approach has the decisive advantage in that broad constructs have a higher predictive utility and, at the same time, measure more economically, due to a lower number of items, instead of a measurement with items of all tangent constructs.

3.2.1. Sample

We conducted an online survey to test our developed items based on the results of RQ1. A market research institute had recruited participants who already had experience with agility in their company. Additionally, the participants had to go through screening to make sure that they fit to the sample. The participants were from a wide range of different work sectors, the main two being services (18%) and IT (14%). The sample included 67% male and 33% female participants with an average age of 42.99 years (SD = 11.48). To ensure data quality, we cleaned the data carefully. There were responses from 449 survey participants after cleaning.

3.2.2. Data collection and analysis

Based on the results of RQ1, we first looked for so-called orbiting constructs, namely constructs that are close to AM in terms of content in some way or suggest a tendency to overlap. We therefore investigated the literature using the INN construct-level searching tool (Larsen and Bong, 2016) and semantic scale network tool (Rosenbusch et al., 2020) and discussed further orbiting constructs in a workshop with other academics. We identified 79 orbiting constructs. The closest constructs in terms of content (orbiting constructs) were scales such as "workforce agility" (Breu et al., 2002), "meaning" as a part of psychological empowerment (Spreitzer, 1995), "customer orientation" (Saxe and Weitz, 1982), "openness" (McCrae and Costa, 1987), and "work-related curiosity" (Mussel et al., 2012). We used this and other identified orbiting scales to check the extent to which the already validated item formulations were adaptable to AM. For our item development, we followed the recommendations of DeVellis (2017). The wording of our items was split from two sources: the expert interviews that we had conducted and the already validated items from the constructs close to AM. Their wording of the items could therefore be used as an already validated basis for adapting them according to our data structure results from the Gioia approach (Gioia et al., 2013). In this way, we developed a pool of 55 items that were based on AM conceptualization. Comments by a panel of four academics and two practitioners of a management consulting company for agility helped us improve and select our items. In this step, we adapted and deleted further items. After that, we ended up with 25 items reflecting an AM. To test the reliability and validity of our scale, we conducted an online survey with 449 participants (Eilers, 2022).

As recommended by Worthington and Whittaker (2006) and as Rasool et al. (2021) did in their measurement development paper, we tested the structure of the AM survey instrument using exploratory factor analysis. Both Bartlett's test (Chi^2 (378) = 4736.94, $p < 0.001$) and the Kaiser–Meyer–Olkin measure of sampling adequacy (KMO = 0.935) indicated that the variables were suitable for factor analysis (Worthington and Whittaker, 2006). Furthermore, the anti-image correlation showed that no variables were less than 0.86. Thus, a principal component analysis with varimax rotation was performed. Based on the screen plot and the eigenvalues of the factors ≥1.0, a four-factor solution was offered, explaining 52.46% of the variance. To avoid unclear cross-loadings and improve the economic application, five items were removed. After that, only one item, "I like supporting other people in my team," showed indistinct cross-loadings next to the assigned dimension "attitude towards collaborative exchange" with the dimension "attitude towards empowered self-guidance." From the expert interviews, the connection of the two dimensions could be logically justified, since

proactive support within a team has a self-guidance aspect in addition to a collaborative aspect. Thus, cross-loading could remain theoretically justified. Furthermore, we are able to identify the item regarding internal consistency (Cronbach's alpha) as relevant and well-fitting. The factor loadings with 20 items can be seen in Table 3. The improved four factors and the included items explain 57.17% of the variance. Based on the classical test theory, we further checked our scale for item scale correlation and calculated the reliability with Cronbach's alpha. The results regarding the corrected item-to-scale correlation of the dimension showed satisfying results with values ≥.50. Two items showed a borderline corrected item-to-scale correlation of 0.43 and 0.47. Every subdimension showed a Cronbach's alpha of 0.71 or higher. The overall scale of the AM offered a Cronbach's alpha of 0.91. Furthermore, we performed a confirmatory factor analysis and calculated McDonald's omega (0.90), AVE (0.77), and composite reliability (0.93).

3.3. Quantitative survey to investigate the relationship between agile mindset and organizational performance (RQ3)

3.3.1. Research model and hypothesis development

Organizational agility enables a company to respond quickly and competitively to changes in the marketplace. As a result of an organization's higher agility, higher profits and lower costs can be expected (Sambamurthy et al., 2003; Lu and Ramamurthy, 2011; Tallon and Pinsonneault, 2011; Ofoegbu and Akanbi, 2012; Chen et al., 2014; Queiroz et al., 2018; Arokodare et al., 2019; Kale et al., 2019). For example, Queiroz et al. (2018) showed the positive impact of process agility on performance regarding IT application orchestration capability. They argued that agility mediates the relationship between such capability and organizational performance, which they confirmed in a quantitative survey. Harraf et al. (2015) offered a review of agility on an organizational level and its connection with organizational effectiveness. Tallon and Pinsonneault (2011) also showed the mediating effect of strategic agility in their research. Their study addressed the influence of strategic IT alignment on organizational agility and its effect on business performance. Other scholars have focused strategic agility on perceived performance in manufacturing companies and were able to show the connection between strategic agility and organizational performance in this context (Ofoegbu and Akanbi, 2012). They stated: "Everybody in the organization has a sense of belonging, to be motivated, to contribute, to overall organizational performance" (Ofoegbu and Akanbi, 2012, p. 159). Based on this previous research, we propose the following hypothesis:

H1: Strategic agility is positively related to organizational performance.

Agility requires a change in the experience and behavior of actors in an organization (Crocitto and Youssef, 2003). To continuously screen and respond to a dynamic environment in a promising way, actors are required to have an AM to a great extent. By exhibiting high levels of the dimensions of an AM, they should contribute to more pronounced strategic agility. Based on this, the following hypothesis will be verified:

H2: The agile mindset is positively related to strategic agility.

Along with the sociotechnical theory, to achieve a organization's desired performance, it seems relevant to focus on actors who bring a mindset that is compatible with an uncertain, digitally driven work environment. In practice, this is often referred to AM. An actor with a highly pronounced AM should thus contribute to stronger strategic agility, positively influencing their organization's performance. Actors who have a high AM rate professional exchanges with other colleagues positively and thus support them in their performance. They consider it important to address errors or obstacles and keep their customers in mind in their work. Customer orientation, as a near construct that is not aligned to a dynamic environment, is also shown to be related to performance outcomes (Grizzle et al., 2009; Brockman et al., 2012). In the context of agility, viewed through sociotechnical theory in a digitally driven VUCA environment, however, it can be assumed that it is not AM that directly influences performance but rather the AM of actors that

Table 3
Principal component analysis with varimax rotation.

	Attitude towards empowered self-guidance	Attitude towards customer co-creation	Attitude towards learning spirit	Attitude towards collaborative exchange
I can decide for myself how I achieve a work goal.	**0.71**			
I am good at organizing myself.	**0.63**			
I learn new skills that help me handle changes.	**0.59**			0.48
I use mistakes as a chance for me to adjust my approach.	**0.58**		0.37	
I have the courage to take on new tasks for which I do not yet know all the requirements.	**0.58**			
I adjust to changes.	**0.54**			0.37
Through direct conversation, I try to find out what my customer needs.		**0.79**		
I talk to my customers regularly.		**0.76**		
I try to find out what is most important for the customer.		**0.67**	0.45	
While working, I frequently think about how my job helps customers.		**0.63**		
I try to reach my goals by satisfying customers.		**0.60**		
I come up with new ideas to better complete my tasks.			**0.72**	
I like exchanging views with others about the challenges of reaching our goal.			**0.71**	
It is important to me to always learn something new.			**0.66**	
I enjoy exploring new situations.			**0.57**	
I solve difficult challenges best when I work together with others in a team.				**0.76**
I like making my work transparent for others.				**0.63**
				0.60

(*continued on next page*)

Table 3 (*continued*)

	Attitude towards empowered self-guidance	Attitude towards customer co-creation	Attitude towards learning spirit	Attitude towards collaborative exchange
I appreciate the different perspectives within my team.				
I like supporting other people in my team.	0.52			**0.37**
I regularly review my approach with others.				**0.54**

Note: Values up to 0.35 are suppressed.

contributes to the agility of the organization. This, in turn, leads to the organization's increased performance. In this perspective, strategic agility plays a mediating role. Based on this line of reasoning, the following hypothesis should be tested:

H3: Strategic agility mediates the effect of the agile mindset on organizational performance.

3.3.2. Sample

To investigate our research model based on the socio-technical system theory, we used the same data that were used for answering RQ2 with 449 participants.

3.3.3. Measures

To measure AM, we referred to the results after RQ1 and RQ2 were answered. The previously developed scale captured AM as an attitude. The 20 items were recorded on a 7-point Likert scale (1 = strongly disagree; 7 = strongly agree).

Agility refers to how easily and quickly organizations can sense and respond to a dynamic market environment and change their strategy in this regard (Tallon et al., 2019). In this context, Sambamurthy et al. (2003) proposed three relevant areas that constitute the agility of a company: customer responsiveness, business partnerships, and operations. Based on this definition, Tallon and Pinsonneault (2011) developed a scale "to assess the ability of firms to easily and quickly change their strategy in each of these three areas" (Tallon and Pinsonneault, 2011, p. 473). We used this scale in our study. All items were rated on a 7-point Likert scale (1 = strongly disagree, 7 = strongly agree). (Tallon and Pinsonneault, 2011) study supported the reliability and validity of the scale. Organizational performance refers to how far an organization can progress in its business goals (Kim et al., 2012). To measure the perceived organizational performance of our participants, we used the scale of Queiroz et al. (2018), which is based on Powell and Dent-Micaleff (1997) and already has satisfactory validation characteristics. The scale included items regarding market share, sales growth, revenue, and profitability. While Powell and Dent-Micaleff (1997) included a three year period in their scale, we used the adapted items to better reflect the competitive situation. This approach and the implied item wording were already used in a scale by Queiroz et al. (2018). The scholars showed reliability and cross-validity in their study. The five items of the scale were measured with a 7-point Likert scale (1 = strongly disagree, 7 = strongly agree).

3.3.4. Analysis

We used the PROCESS plugin for SPSS by Hayes (2012, 2013) to conduct our analysis and test our research model. Table 4 shows the descriptive statistics, Cronbach's alpha, and correlations between the variables.

The research model (see Fig. 1) presents a mediation between AM, strategic agility, and organizational performance. Four criteria must be met to represent complete mediation, according to Baron and Kenny (1986) and Holmbeck (1997): 1) the relationship between the independent variable and the mediator (path a) must be significant, 2) the mediator and the dependent variable must be significantly related (path b), 3) the relationship between the independent and dependent variables without considering the mediator must be significant (path c), and 4) path c must become smaller or no longer significant when the mediator is taken into account (path c').

In our research model, we proposed the AM as an indirect determination of organizational performance. The regression analysis showed that path a, namely the relationship between AM and organizational agility, was significant, with 0.80**. Path b, showed a significant relationship between strategic agility and organizational performance (0.56**). And path c, the direct effect of AM to organizational performance without taking organizational agility into account, presented a significant effect (0.48**). To fulfill the fourth criterion of a valid mediation, the effect of AM on organizational performance was calculated taking organizational agility as a mediator variable into account. This showed that path c' was 0.03 and not significant. Thus, there was complete mediation of AM on organizational performance via organizational agility. The indirect effect (path a $\times$ path b) of the mediation was 0.45. The overall model explained 22% of the variance (R^2), which can be seen in Fig. 1. We tested our research model for common method bias with Herman's single factor test (Podsakoff and Organ, 1986) and a correlation test (Bagozzi et al., 1991; Pavlou et al., 2007) and could not identify problems regarding common method variance.

4. Results and discussion

4.1. What is an agile mindset?

Based on our data, we can specify the general property "attitude" for the AM of an individual. Eagly and Chaiken (1993, p. 1) defined attitude as "a psychological tendency that is expressed by evaluating a particular entity with some degree of favor or disfavor." An individual with a strongly developed AM evaluates learning, exchanges with others, their own work organization, and value creation in terms of the customer in a highly positive way. We postulate the following definition accordingly: The AM is the attitude of an individual within a dynamic work context that is expressed by positively evaluating how they: 1) continuously seek

Table 4
Descriptive statistics, Cronbach's alpha and Spearman's rho correlation of the variables.

		Mean	SD	1	2	3	4	5	6	7
1	Agile mindset scale	6.21	0.64	.91	.840**	.795**	.757**	.747**	.504**	.198**
2	Attitude towards learning spirit	6.31	0.77	.840**	.71	.588**	.524**	.630**	.438**	.198**
3	Attitude towards collaborative exchange	6.10	0.76	.795**	.588**	.71	.418**	.538**	.407**	.128**
4	Attitude towards empowered self-guidance	6.27	0.70	.757**	.524**	.418**	.80	.485**	.382**	.218**
5	Attitude towards customer co-creation	6.14	0.93	.747**	.630**	.538**	.485**	.81	.390**	.123*
6	Organizational agility	5.49	1.15	.504**	.438**	.407**	.382**	.390**	.88	.450**
7	Organizational performance	5.11	1.39	.198**	.198**	.128**	.218**	.123*	.450**	.92

Note. SD = Standard Deviation; Cronach's alpha can be seen in the diagonal of the correlations.
*=p<.05; **=p<.01.

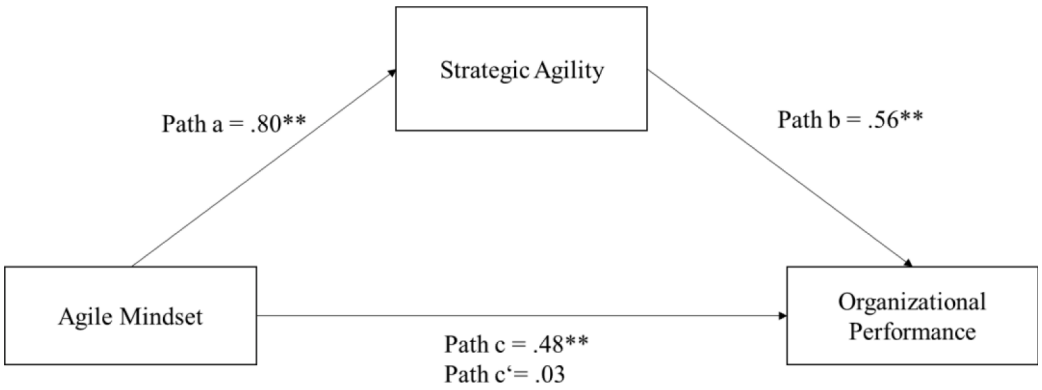

Fig. 1. Results of the analyzed research model.

new insights to respond to changes, 2) transparently share and discuss methods and results of work with others, 3) decide for themselves how to proceed, and 4) are continuously customer oriented in a co-creation process at work. Attitude is not fundamentally manifest, but changeable over time (Schwarz, 2007), as the following interviewee pointed out, "I can influence it and thereby allow people to change it [their agile mindset] themselves" (I5).

The attributes shown in the conceptual theme were common in most of the interviewees' descriptions. The definition is not too specific and not too broad (Wacker, 2004). Wacker (2004) also recommended modifiers, which we included in our definition, e.g., 'value creation for the customer" or "own work organization," to make the description of the construct even more precise. The nature of the AM construct was analyzed more deeply using the approach of Polites et al. (2012). AM is not directly observable and measurable and is therefore specified as a latent construct (Polites et al., 2012). This indicates that the construct is measured via an indirect measurement with several items that capture AM (Bechger et al., 2003). The identified dimensions are called "attitude towards learning spirit," "attitude towards collaborative exchange," "attitude towards empowered self-guidance," and "attitude towards customer co-creation," which could all be distinguished from each other. Indicators such as "glad to try out new things and experiment" and "being interested in new topics and issues" in turn reflect the four dimensions and are interchangeable within them. Based on this, it can be assumed that AM is a reflective first-order and a reflective second-order construct. This multidimensional structure is widely used in psychology

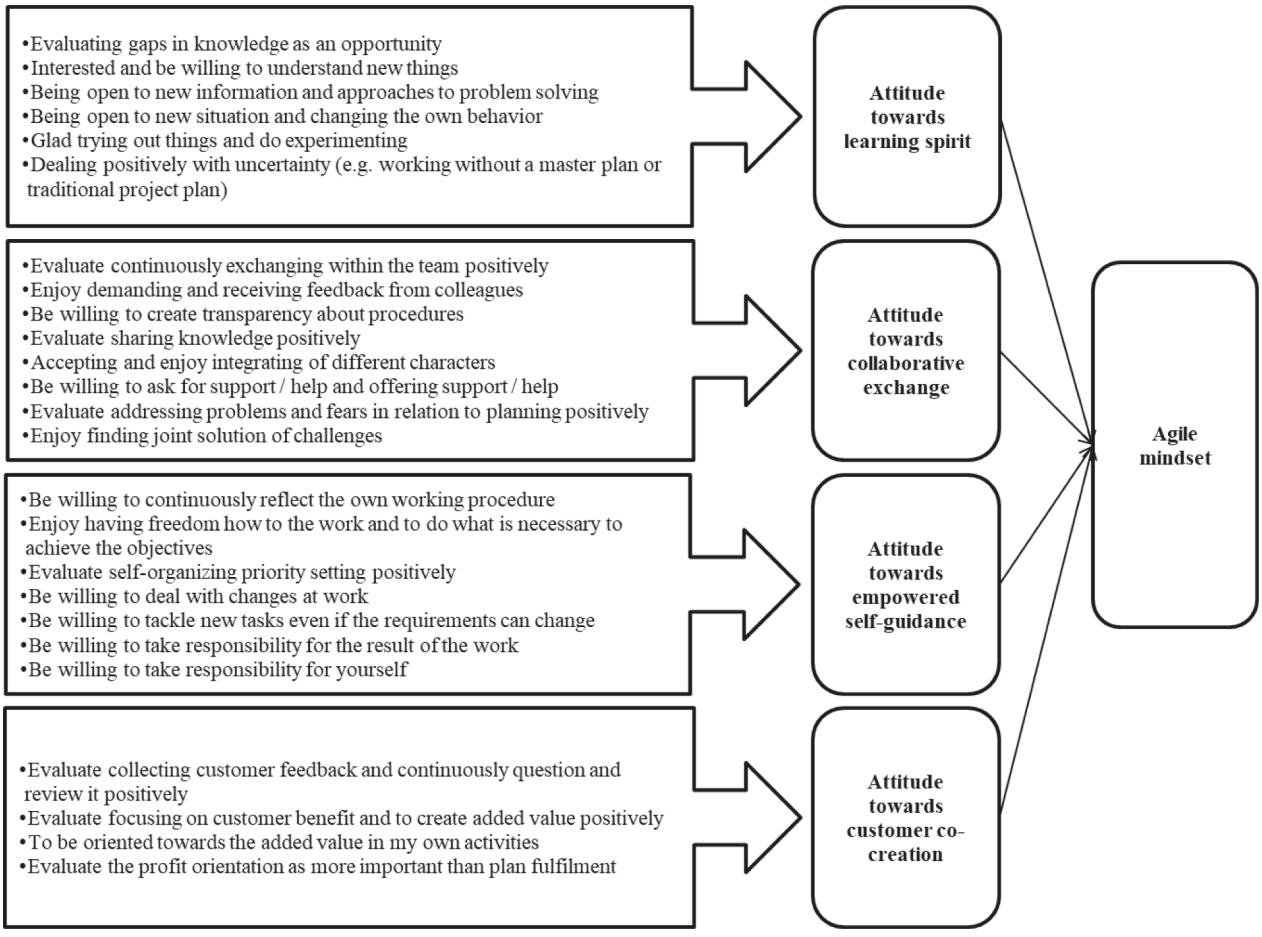

Fig. 2. Data structure.

and IS research (Polites et al., 2012). The dimensions are explained in more detail below. In each case, we begin with a description of the dimension and show how it can influence value-oriented behavior in digitization; we then place it in the literature strand of strategic agility capabilities as a theoretical framework according to Doz and Kosonen (2010), Morton et al. (2018) and Debellis et al. (2021). The data structure can be seen in Fig. 2 and shows the consolidation process from data through dimensions and AM.

4.1.1. Attitude towards learning spirit

The first identified dimension of AM is called "attitude towards learning spirit." It is the degree to which an actor evaluates openness and searches positively for new things regarding their work in a digitally driven VUCA environment. Failures and knowledge gaps are opportunities to learn new things. This attitude seems to be especially important in such a VUCA environment because of the dynamics the work offers. Furthermore, it is necessary to enjoy experimenting and trying out new things for emerging practices to deal positively with this uncertainty. This is actually what Kane et al. (2015) offered as relevant in a digital transformation.

Actors with a high level of this dimension are more likely to exhibit value-creating behaviors in the context of digitalization. This is demonstrated, for example, by the tendency to actively search for new innovative (technical) solutions for their own work. They are open and curious about new technology and try it out to learn from it and derive work benefits for themselves. In doing so, they are inspired by new technological innovations and generate new knowledge and skills with new technologies such as robotic process automation. In turn, they transfer this knowledge to their own work and thus promote the process of digitalization in their organization. In addition, they are more amenable to new types of digital projects that are, for example, mediated and handled via online labor markets.

The "attitude towards learning spirit" mindset dimension has a strong connection with the literature on strategic agility and transfers it to an individual (employee) level. By focusing on continuous learning, actors pay attention to strategic sensitivity, which is a core capability for strategic agility (Doz and Kosonen, 2010; Morton et al., 2018; Shams et al., 2021). By constantly searching for new things, actors intensively perceive their environment and the market and react accordingly. Our results are further in line with Miler and Gaida (2019) who included an "open mind" as part of the AM, as well as with Senapathi and Srinivasan (2013), who pointed out the relevance of using learning opportunities.

4.1.2. Attitude towards collaborative exchange

"Attitude towards collaborative exchange" refers to the extent to which an actor positively values transparent work and sharing knowledge to solve problems by swapping information and ideas with colleagues. Working in a digitally driven VUCA environment often demands cross-functional teams to deal with challenges. Actors with a high extent of "attitude towards collaborative exchange" think it is important to integrate different perspectives, and they enjoy asking for help and supporting others.

This dimension also tends to lead to actors' behaviors that can be supportive in the context of digitalization. If the "attitude toward collaborative exchange" is high, the actors may tend to make their knowledge and experience available through collaboration tools and knowledge management platforms or by participating in online workspaces and discussion forums (Morton et al., 2018). Thus, they are more likely to use such technologies. Actors may also be more likely to be active in the form of social network applications, through which they can ask questions, discuss issues, and solve collaborative problems. As a result, actors collaborate across departments and locations in the sense of digital and cross-functional networking. Collaboration tools can be supportive in showing drafts of new business models, improvements in product development or prototypes and stimulate discussion. Acquired knowledge of new technologies (e.g., robotic process automation) and how they support the respective actor is readily shared, thus advancing the digitalization of an organization.

The "attitude towards collaborative exchange" complements previous theory on strategic agility capabilities. By making one's own working methods transparent, interacting openly with other actors, and thus exchanging knowledge, resources are effectively shifted within an organization, which strengthens the "resource fluidity" strategic agility capability (Doz and Kosonen, 2010; Morton et al., 2018; Debellis et al., 2021). Further research has shown the relevance of knowledge-sharing and investigated individual and interpersonal determinations for hindering knowledge sabotage (Perotti et al., 2022). Besides this, previous results have shown that innovation increases through interaction between IT personnel and promoters (Kettinger and Lee, 2002; Fink and Neumann, 2007; Panda and Rath, 2017) or by combining internal and external knowledge (Ferraris et al., 2017). To strengthen collaborative exchange, organizational democracy, which has been shown to have positive effects on knowledge sharing (Rezaei et al., 2021), could be take into account. While the "leadership unity" strategic agility capability in the previous conceptualization was only related to senior teams, "attitude towards collaborative exchange" can be used as a basic model that goes beyond them. According to this, not only the senior team should make "bold," "fast" decisions, without being caught up in "win–lose politics" (Morton et al., 2018, p. 96) but the actors as a whole should develop data-based and collaborative solutions. "Attitude towards collaborative exchange" could further strengthen collaborative innovation, which leads to technology transfer (Scuotto et al., 2020). Previous literature on AM includes team communication, team structure (self-organized, cross-functional), or team attitudes (Senapathi and Srinivasan, 2013; van Manen and van Vliet, 2014; Denning, 2016). An individual actor perspective regarding interactions with others has been missing so far in agile mindset theory. Our results sharpen and extend the theory in this case.

4.1.3. Attitude towards empowered self-guidance

The third dimension, "attitude towards empowered self-guidance," can be defined as the extent to which actors positively value reflection on themselves and their work processes, organize themselves, and take responsibility for their work. Actors enjoy deciding proactively by themselves how to proceed with work and reflecting on their own procedures. As is also included in the agile manifesto (Beck et al., 2001), actors value goal achievement (the "what?") more highly than sticking to a precise plan to get there (the "how?"). In doing so, they find it essential to take responsibility for goal achievement and adapt to changes in work in a self-organized manner. Taking responsibility for oneself also plays a role. Since actors in agile contexts, driven by digital technology, usually have more freedom and responsibility (Forsythe, 1997; Kane et al., 2015; Schwaber and Sutherland, 2017) to make decisions quickly and apply their expertise to change, this AM attitudinal dimension supports the actor.

A high level of this mindset dimension tends to be accompanied by behaviors that support the digitization of an organization. For example, AM actors use digital tools more easily to monitor their own work and thereby increase the value contribution of their work process and the result. They also like to use digital collaboration or project management tools to organize themselves or projects in a team. They decide on the next steps in their work based on current data. When collecting data and organizing their own work, they also tend to consider new types of technology, such as robotic process automation.

The "attitude towards empowered self-guidance" plays into all three strategic agility capabilities (Doz and Kosonen, 2010; Morton et al., 2018; Debellis et al., 2021). The preferred self-organized and data-driven approach of AM actors can strengthen strategic sensitivity, as they proactively search for the most value-oriented work processes. In this context, value-oriented also means making available the resources identified during their own reflection process, which in turn goes along with resource fluidity. With a high degree of "attitude towards

empowered self-guidance," it is important to make decisions within the context of one's own work process and the work results that lead to the highest sustainable value contribution. Thus, the AM dimension is also connected with leadership unity and transfers the capabilities of strategic agility on the individual actor level. Experimenting and using mistakes self-organized as an opportunity to adapt one's own work process is in line with previous research on VUCA (Bresciani et al., 2021). While previous theory includes self-organization and autonomy as relevant aspects of AM (Denning, 2016; Ozkan et al., 2020), we specified them in connection with responsibility for actions taken when dealing with self-organization in response to a changing environment.

4.1.4. Attitude towards customer co-creation

"Attitude towards customer co-creation" describes the extent to which an actor in a digitally driven VUCA environment positively values being continuously oriented towards value for the customer and staying in direct contact with them. The actor continuously seeks feedback from direct customers, even on lightweight solutions. They consider it important to always align with the customer's value to sense and respond to changes quickly.

Actors who have a strong "attitude towards customer-cocreation" can promote digitalization within their organization through certain behaviors. For example, they tend to use digital options to interact with customers. Integrated new technologies such as 5 G or IoT connectivity can support identifying customer challenges and needs. In doing so, actors integrate customers through augmented reality elements, for example, and evaluate new prototypes. For direct customer orientation, actors collect data, which is generated in direct interaction or through customer behavior. In digital information hubs, actors like to access real-time data from their customers to directly evaluate the value delivery of their activity with the customer.

Cunha et al. (2020) described how organizations sometimes struggle or misinterpret changes in the market environment and accordingly do not show the necessary strategic sensitivity (Doz and Kosonen, 2010; Morton et al., 2018). They stated that this issue requires a new mindset to face this (Cunha et al., 2020). The "attitude towards customer co-creation" dimension of AM plays a role in this topic. The theory of strategic agility capabilities (Doz and Kosonen, 2010; Debellis et al., 2021) is extended to the effect that actors with a high level of the "attitude towards customer co-creation" dimension are close to their customers and thus also to the market. Through the continuous reflection and integration of the customer, dynamic developments in the market can be interpreted more correctly. The relevance of external knowledge for innovation (Ferraris et al., 2017), firm performance, and competitiveness (Dezi et al., 2021) can thereby be confirmed. While previous research understands customer orientation is not forced as a construct that has to be implemented in direct customer contact, we sharpen customer orientation in the "Attitude towards customer co-creation" dimension to the effect that the focus is on direct exchange and participatory integration in the value creation process for customers.

4.2. How can agile mindset be measured?

We developed a measurement instrument for agile mindset, which has been missing so far in theory. The reliability of the data structure was satisfactory (Cronbach's alpha $\geq$.71), and the descriptive analyses showed no abnormalities. With the exception of one item, the examination of the factor loadings also provided an acceptable result, and the item can be well justified based on theory. The length of the scale covers all four dimensions but also allows economical handling. The items can be seen in Table 3. Previous conceptualization of AM (e.g. Senapathi and Srinivasan, 2013; van Manen and van Vliet, 2014) showed important insights of the agile mindset but were too broad over several levels of analysis to form the basis for a measurement tool. Morton et al. (2018) already called for further exploration of strategic agility at the individual level. With the development of our measurement instrument, we are filling precisely this gap.

4.3. What is the relationship between agile mindset and organizational performance?

Building on sociotechnical systems theory and the previous literature, we formulated three hypotheses that postulate the relationship of AM for organizational performance. As a corporate response to the increasing VUCA environment, strategic agility should thus have a significant impact on organizational performance (H1). The individual's AM should have a positive impact on organizational agility (H2). To investigate the relevance of AM for organizational performance, we deduced that AM has an indirect effect through strategic agility (H3).

All three hypotheses in our model have been confirmed. Full mediation explains 22% of the variance. The strong indirect effect of AM on organizational performance was 0.45, suggesting the important role of the employee mindset. Since strategic agility and the AM of employees are highly correlated (0.80**), AM is important for considering and promoting successful strategic agility. These results are in line with findings of Arokodare et al. (2019) and Van Manen and Van Vliet (2014), who searched for the relation between agility and organizational performance. However, different to Arokodare et al. (2019) we did not investigate culture as a moderator between agility and organizational performance, rather the agile mindset of the actors as a determinant. This enables us to expand previous theory on the AM and increased the nomological network around agility.

5. Limitations and future research

Like all research, our study is subject to limitations. Since all variables of the online survey were collected simultaneously from the same source, there is a risk of a common method variance (Podsakoff et al., 2003). Even though our results indicate that common method variance did not have a serious influence, in the interest of future research, the findings should be confirmed by different survey types. For example, objective performance measures, instead of perceived performance measures, may provide clues in this regard. Although our study shows a satisfactory overall results, one item shows conspicuous cross-loadings to a second factor. In future studies, a reformulation of items could yield a clearer loading on the dimension. We therefore call to improve our scale further. All participants worked for organizations in Germany, Austria, and Switzerland, which might have cultural implications at the individual and organizational level. It would be interesting to check whether the correlations differ in other cultures, for example, with greater power distance (Hofstede and Bond, 1984).

Moreover, it could be of great interest to investigate influences on AM in future research. On the one hand, a trickle-down effect of managers' AM to employees could provide valuable further insights or an extension of AM in terms of an "agile leader mindset." Ferraris et al. (2021) offered the first results on how the cognitive capabilities of a CEO influence strategic agility. How manager with an agile mindset empower their employees (Durward et al., 2019; Simmert and Peters, 2020) to develop an agile mindset could provide relevant knowledge for strategic agility. On the other hand, other structural conditions, such as working methods, could also influence the development of AM. To explore the nomological network of AM even further, specific behaviors and practices, such as knowledge-sharing behavior (Suofi et al., 2014; Perotti et al., 2022) or social agile practices (Hummel et al., 2015) should be taken into account. Further, more deeper insights with multiple case studies on how actors with an AM interact with specific digital technologies and innovation such as crowd working platforms (Durward et al., 2019; Simmert and Peters, 2022), and how this improves other outcomes over time beyond organizational performance (e.g., job satisfaction, fluctuation, organizational decision time), can add valuable insights into strategic agility theory. We further call for research of the agile mindset on team and organizational level.

With our study, we provide a springboard to take a closer look at the exploration of the AM in different settings and contribute to the success of strategic agility.

6. Conclusion

With increasing VUCA characteristics of the business environment, the need for strategic agility to ensure and improve the performance of organizations is also growing. However, implementing agility is not always successful, and some fail. The reasons for this can often be identified at the actor's level: in their AM. For successful strategic agility, companies need actors with an AM. But until today, a conceptualization with a measurement tool to monitor and promote AM has been missing.

6.1. Theoretical contribution

In this problem context, our study makes a relevant contribution to research. First, it conceptualizes the AM of actors and a theory of how it adds value to organizations. We thereby close the research gap that previous conceptualizations of AM have left, as they have not been specific enough for the individual, have provided multiple levels within the definition, or have been unclear in their differentiation, entity, or domain. We capture AM as an attitude of the individual, which influences an organization's strategic agility and thus benefits its performance. On top of these, we describe how actors with an high extent of AM deal with digital disruption in a value-creating manner.

Second, based on this paper's conceptualization of AM, we allow, for the first time, the quantitative capture of AM using a measurement tool. Besides, it enables other researchers to use the suggested measurement tool for their research, refine it, and thereby further explore agility at the actor's level.

Third, our study extends the nomological network concerning the investigation of AM and its relevance for organizational performance in the digitally driven VUCA context. Previous studies have often only considered technical or work design aspects in agile ways of working. The social aspects, in terms of agility and organizational performance, have received only limited attention so far. However, the experience, evaluation, and behavior of employees are shown to have an important influence on the success of organizations (van Manen and van Vliet, 2014; Dikert et al., 2016) and therefore represent an important research gap that we have addressed in our paper. We have expanded the theory of strategic agility capabilities by describing the interrelation of AM dimensions through the three key strategic agility capabilites of Doz et al. (2010) and increased the nomological network of strategic agility by including AM as a relevant determinant for strategic agility.

6.2. Practical contribution

There is currently no industry standard for how organizations understand AM and how it contributes to strategic agility or organizational performance. However, executives who are responsible for implementing strategic agility of their organization face the challenge of aligning actors with transformation to remain high-performing in the digitally driven VUCA environment (Bennett and Lemoine, 2014; Alt et al., 2020). The demonstrated relevance of the AM, the clear conceptualization and measurement tool of the AM provided in this paper represents valuable insights for several target groups: executives, employees as well as human resource management and talent development departments.

Executives knowledge of AM enables them to promote strategic agility for organizational performance. By quantitatively recording AM, executives have the opportunity to investigate the organization's status quo and thus enable a number-based impression of the current situation and they can take concrete actions to support the actors. Furthermore, they can assess the impact of these actions by evaluating AM after those actions. The implementation of strategic agility can thereby be accompanied and pushed by using data.

Employees have a common understanding about what AM is and can get an insights about their own AM. We already used the conceptualization in retrospectives with agile teams to speak about the relevance and impediments which hindered employees and teams to achieve an agile mindset and transfer it into action. By doing so, the conceptualization of AM improves agile work and supports individual actors as well as teams to perform in a VUCA environment.

Furthermore, human resource management and talent development departments can install targed-oriented initiatives and providing a framework in which actors can develop their AM themselves (Cunha et al., 2020). Our explanation of how actors deal with new technology and digital tools fosters the relevance for staffing and composing teams for innovative projects. The effects of treatments, actions, and human resources (Ferraris et al., 2019; Cunha et al., 2020) management practices can also be verified through pre and post surveys and thus positively influence organizational performance through a successful agile transformation.

As our paper has clearly pointed out: AM matters because it is a strongly influential factor for successful strategic agility and organizational performance in a digitally driven VUCA environment.

Declaration of Competing Interests

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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Karen Eilers is Associated Researcher at the Institute of Information Management, University of St. Gallen. Her research interest focuses on challenges and solutions for organizations, leaders, and employees in agile transformation.

Prof. Dr. Christoph Peters is Assistant Professor at the Institute of Information Management, University of St. Gallen. His research focuses on the sociotechnical design of digital work and service systems with a special focus on hybrid intelligence.

Prof. Dr. Jan Marco Leimeister is Professor and Director at the Institute of Information Management, University of St. Gallen. His primary research fields comprise crowdsourcing, crowd work, digital business transformation, service development, service management as well as collaboration management.