

Beliefs on People Analytics: An Empirical Investigation into how Symbolic Expressions Shape SMEs' Technology Perceptions

Completed Research Paper

Introduction

Human resources (HR) professionals see prospects in people analytics (PA), inspired by the successful use of analytics from other departments such as finance and marketing. Relying on data instead of intuition and experience, PA promises increased organizational effectiveness over traditional HR decision-making (Tursunbayeva et al. 2018). PA is a socio-technical system that subsumes workplace technologies which collect and analyze employee data to provide fine-grained insights into “organizational resources, processes, people, and their performance”, facilitating evidence-based HR decision-making (Gal et al. 2020, p. 1). It integrates data from various sources and is based on advanced analytical methods (Tursunbayeva et al. 2018). For example, the tools may help managers continuously measure employee engagement or identify and attract the right talent in a competitive environment. Employees can use PA for self-organization and empowerment (Gierlich-Joas et al. 2020), and to receive customized talent management (Marler and Boudreau 2017). However, PA bears risks. Rising levels of transparency can trigger employee privacy concerns (Teebken and Hess 2021), a loss of motivation (Tams et al. 2020), or severe negative impacts on employees' well-being (Alder 2001).

Driven by novel HR technology and a growing landscape of intelligent tools, a PA hype emerged in recent years (Angrave et al. 2016; van der Togt and Rasmussen 2017; Volini et al. 2019). Despite increasing adoption levels, the absolute level of adoption is only growing slowly (Chen et al. 2018). Concomitantly, there are conflicting reports about the low maturity of PA in organizations (Chen et al. 2018; Davenport and Anderson 2019). To successfully leverage the technologies' potential, organizations must overcome ethical challenges like opacity and unintended nudging and implement transparent change management (Gal et al. 2020).

PA provokes divergent associations for different stakeholder groups, and how they interpret the technological features is at odds. This challenge is fueled by the lacking conceptual clarity of PA (Gal et al. 2017; Tursunbayeva et al. 2018). Like all highly nonmaterial technologies, many stakeholders are involved in constructing its meaning and shaping its trajectory (Gal et al. 2022). As our study discovers, managers in charge of implementation decisions for PA have insufficient knowledge about the technology's features. Managers report confusion about how PA works and adds value, given the growingly divergent landscape of available technology. They espouse skepticism if the promises are delivered and remain cautious about the risks of introducing the technology (Hüllmann and Krebber 2020). This confusion and the knowledge scarcity spark manifold beliefs on PA. Confronting these beliefs with the reality of PA may lead to unmet expectations. These subjective beliefs complicate the introduction of PA into organizations and contribute to failing projects. As a result, it is crucial to uncover how these beliefs are formed. Knowledge about how beliefs are formed enables addressing these misinformed expectations. It contributes to effectively introducing PA in organizations, reducing project failures, and reaping the rewards of data-driven decision-making.

To investigate the beliefs of PA, we use the concept of symbolic expressions (Markus and Silver 2008) which builds on the adaptive structuration theory (AST) by DeSanctis and Poole (1984). Symbolic expressions are a theoretical lens that explains how individuals form beliefs on technological artifacts. Following Markus and Silver (2008), symbolic expressions are defined “as the communicative possibilities of a technical object for a specified user group” (p. 623). Symbolic expressions emerge as a negotiation between an individual and technology. They explain how beliefs are formed by taking individual predispositions and social structures into account when an individual interprets a technology's material properties. Hence, symbolic expressions are well suited for inquiring about a socio-technical system such as PA, which is characterized by distinct beliefs among stakeholders.

Empirically, we focus on small and medium-sized enterprises (SMEs) and conduct 36 semi-structured interviews. Scholars have paid dedicated attention to digital transformation in SMEs (Canhoto et al. 2021; Mandviwalla 2021). However, investigations on the SMEs' beliefs on PA are lacking. While global players are more risk-taking towards implementing novel digital solutions such as PA, and many have established dedicated PA departments during the last decade (Kwok 2021), SMEs face difficulties. SMEs are often family-led businesses with a traditional understanding of leadership (Li et al. 2016). Moreover, SMEs suffer from a shortage of skilled workers (Leifels 2018). They have limited resources, both in financial and human capital (Hewitt-Dundas 2006). These specific characteristics of SMEs hamper the initiation of PA projects (Nieves 2016), although they would benefit from tools that support efficient HR processes and novel leadership practices (Li et al. 2016). We derive the following research question (RQ):

How do managers and employees of SMEs form beliefs about the technological artifact of people analytics?

We contribute to the literature on PA in multiple ways. To the best of our knowledge, this study is one of the first empirical investigations on PA besides various conceptual pieces (Tursunbayeva et al. 2018). With its focus on SMEs, the study is dedicated to the specific requirements of these firms. The study sheds light on the contrasting beliefs of PA and, using the concept of symbolic expressions, derives an explanation for this ambiguity. It highlights contextual factors that guide the formation of beliefs on PA in SMEs. Furthermore, we contribute to the theory of symbolic expressions. Not only do we apply it empirically, but we also theorize how symbolic expressions are negotiated by stakeholders with different norms, values, and positions, and how they are mutually shaped between these stakeholders. Finally, the work contains implications for practice. We derive guidelines for managers in charge of initiating PA projects and design guidelines for developers.

This paper is structured as follows: section two provides an overview of related works on PA and introduces the extended version of the AST by Markus and Silver (2008). Section three explains our data collection and analysis approach using semi-structured qualitative expert interviews with leading functionaries of SMEs. Section four reports the findings before qualitative propositions for the use of PA in SMEs are derived and discussed in section five. Finally, the paper's contribution is highlighted, limitations are pointed out, and an outlook is provided.

Background

The Concept of People Analytics

"People analytics" is an umbrella term that subsumes "human resources analytics", "workforce analytics", and "workplace analytics" (Tursunbayeva et al. 2018). PA is not a novel trend but has emerged over the last decades. Starting in the 1950s, the first payroll systems marked the beginning of basic information systems (IS) for the HR department (Johnson et al. 2016). Driven by their expanding range of functionalities and the increasing amount of data available at the workplace, PA gained importance and spread across industries (Tursunbayeva et al. 2018). Some authors limit the IT artifact of PA to descriptive tools. In contrast, others link them to big data analytics and artificial intelligence (AI) by defining them as "a novel, quantitative, evidence-based, and data-driven approach to manage the workforce" (Giermindl et al. 2021, p. 1). Typically, predictive modeling that generates insights from descriptive and inferential statistical techniques is involved in PA. Employees' behavioral data is collected at a fine-granular level, and data warehouses prepare the data for subsequent analysis; dashboards visualize the data and enable interactive analytics; machine learning algorithms and applications are programmed and embedded into the information technology infrastructure (Gal et al. 2020; Tursunbayeva et al. 2021).

PA is not restricted to the HR department (Johnson et al. 2016) since its importance for any department related to people functions is highlighted (Fecheyr-Lippens et al. 2015). Synthesizing from the literature, we define PA as socio-technical systems that "analyze [people] data from many organizational areas for patterns and present decision-makers with more granular views of organizational resources, processes, people, and their performance" (Gal et al. 2020, p. 1). Looking at application areas, PA can facilitate diverse tasks in the HR field, such as hiring, retention, onboarding, performance measurement, employee training, and various analytics, such as long-term workforce analysis and social network analytics (Hüllmann et al. 2021). Exemplary applications include machine learning of video interviews to identify new hires or linear

regression of pulse surveys to improve leadership skills (Hüllmann et al. 2021). Regarding the level of managerial control, PA can be distinguished into operational and strategic PA, addressing routine structured or long-term unstructured problems, respectively (Anthony 1965; Johnson et al. 2016). For example, PA can support single hiring decisions or long-term workforce planning.

Critics perceive PA as invasive and point out the negative impact on employee privacy. In times of remote work, due to a pandemic, personal and work-life boundaries are blurred, which increases privacy threats (Bhave et al. 2020; Marabelli et al. 2021; Teebken and Hess 2021). With increasing amounts of data becoming accessible, PA facilitates surveillance, leading to employee stress (Tams et al. 2020). PA is criticized for incorporating biases and carries ethical concerns due to the underlying mechanisms' opacity (Gal et al. 2020; Giermindl et al. 2021). In contrast, PA advocates highlight the benefits of increased process efficiency (Mirbabaie et al. 2021), optimized employee allocation and support in different HR functions, and improved decision-making (Levenson 2018; Tursunbayeva et al. 2018).

As the beliefs on PA vary significantly, their implementation in companies is accompanied by certain challenges. Skepticism on PA has to be dispelled, and benefits must be enforced to make their implementation successful. In the following, we review prior literature on the different beliefs of PA, stressing our research gap.

Related Works on People Analytics

PA originated in the HR discipline (Rasmussen and Ulrich 2015; van den Heuvel and Bondarouk 2017) but is increasingly problematized in the IS discipline. Nevertheless, existing research in IS remains scarce. Extant works conceptualize the topic, develop research agendas, or investigate people analytics' negative implications. In a scoping review, Tursunbayeva et al. (2018) deduce a definition from previous works in the HR and IS disciplines. Other definitions are provided by Hüllmann and Mattern (2020) and Gal et al. (2017), who both developed research agendas for PA. The research agendas mostly take a critical stance and suggest reviewing the negative implications of PA. In follow-up studies, Gal et al. (2020) and Giermindl et al. (2021) discuss such negative implications of applying PA in organizations. Other works looking at the benefits and risks of PA include McCartney and Fu (2022) and Clohessy et al. (2018). Themes like the appropriateness of PA, such as privacy, ethical, moral, and other implications are addressed (Gal et al. 2017; Gal et al. 2020; Giermindl et al. 2021; Kloepper and Koehne 2022; McCartney and Fu 2022). Two works take an organizational perspective, proposing how organizations must transform to enable and effectively use PA (Kloepper and Koehne 2022; Peeters et al. 2020). Conversely, Gierlich-Joas et al. (2021) take a leadership perspective and explain how PA can empower employees and managers. Further works provide an overview of why and how PA should be used on different levels of managerial activity (Huselid 2018; Leonardi and Contractor 2018; Levenson 2018; Levenson and Fink 2017; McIver et al. 2018).

Despite prior studies, ambiguous conceptualizations of PA have led to a lack of consensus on what constitutes PA and its boundary conditions (Hüllmann and Krebber 2020). As a result, the discourse is missing strong theory and empirical insights into PA's antecedents and implications. Causal effects are not investigated empirically, except by Aral et al. (2012). The value propositions of PA lack empirical backing. This lack may be caused by the industry's opacity about the internal algorithmic mechanisms implemented in their services and products (Hüllmann et al. 2021).

The nascent research is surprising given the rapidly increasing popularity in practice. Except for a few works (Gal et al. 2020; Giermindl et al. 2021), PA is not present in top AIS outlets. However, PA is an important topic at the intersection of people, organization, and technology. Since previous research focused on conceptualizing the topic, research agendas, and the negative implications of PA, the organizational intention to use and adopt PA is missing scrutiny.

Motivated by contradictory positive and negative beliefs about PA, we inquire about how the beliefs are formed that determine why organizations decide to use or stay away from PA. The formation of these beliefs cannot only be explained by differences in values and norms between organizations (Chen et al. 2018) or by different features of PA technologies in practice. Instead, the beliefs must be seen in the social context of the technology and organization (Markus and Silver 2008). Therefore, we follow the socio-technical lens by Markus and Silver, investigating the symbolic expressions and functional affordances of PA technology that steer the formation of beliefs and inform decisions about adoption.

Theoretical Lens: Markus and Silver's Extension of AST

Analyzing the features of technical objects and how they are interpreted is at the core of the IS discipline (Leonardi 2012; Orlikowski 2000; Sarker et al. 2013). Along these lines, AST by DeSanctis and Poole (1994) is a well-established theory in the IS discipline to investigate the interaction of users with technology on the organizational level. Strongly linked to socio-technical systems (Bostrom and Heinen 1997), AST postulates mutual influences of social structures and technical artifacts in organizations (DeSanctis and Poole 1994). In the original theory of AST, social structures were embedded into technological artifacts as 'spirits' and 'structural features' (DeSanctis and Poole 1994). However, Markus and Silver (2008) criticize these concepts as too abstract and modify them in their extension of the AST.

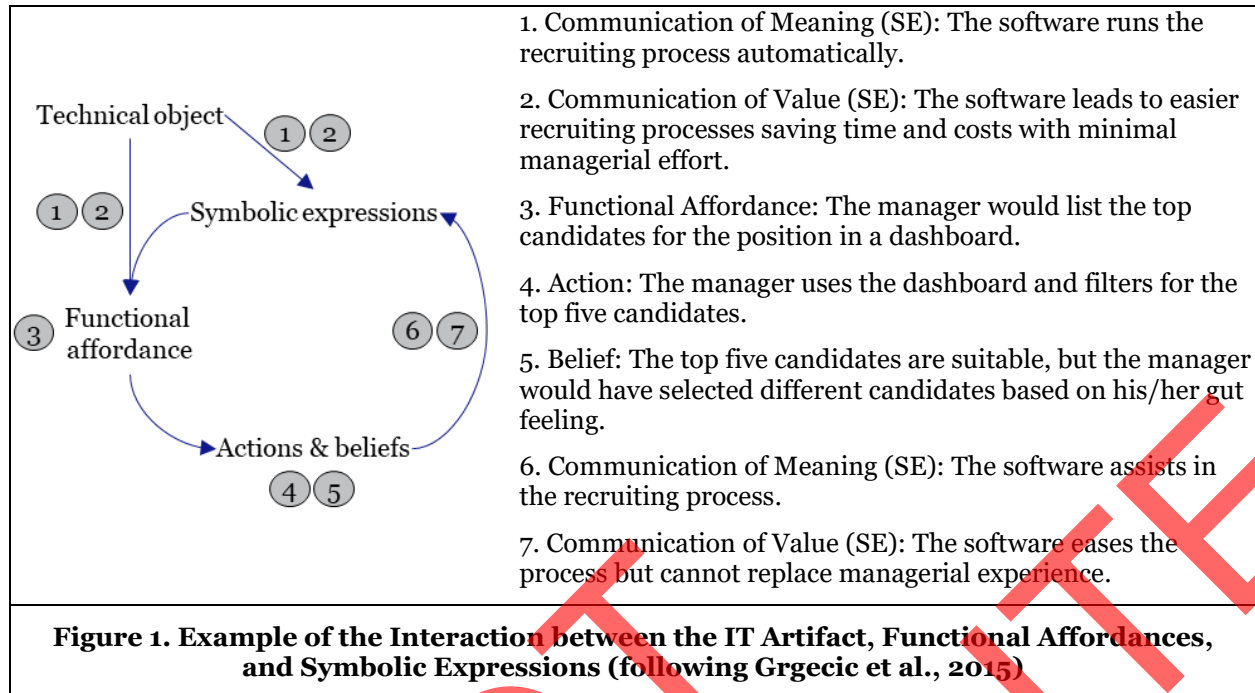
Building on the original theory of AST, they introduce three concepts that describe the interaction between IT and humans: technical objects, functional affordances, and symbolic expressions. Technical object refers to the IT artifact itself, which is material and does not depend on individuals' perceptions. This concept is similar to what DeSanctis and Poole define as 'structural features' and does not contain information on the use of the IT artifact (DeSanctis and Poole 1994). For PA, the technical object can comprise software and hardware components (Rosenkranz 2011). In contrast, the relational concepts—functional affordances and symbolic expressions—refer to the technical object's interaction with different user groups.

Functional affordances are "the possibilities for goal-oriented action afforded to specified user groups by technical objects" (Markus and Silver 2008, p. 622). Markus and Silver (2008) highlight the non-deterministic action potential for users to apply the technical object and focus on the situation- and individual-specific appropriation of technical features (Grgecic et al. 2015). In other words, how users make the technology their own.

Symbolic expressions are defined as "the communicative possibilities of a technical object for a specified user [group]" (Markus and Silver 2008, p. 623). Symbolic expressions can refer to the whole IT artifact or distinct functional components (Goh et al. 2011). The communicative possibilities are distinguished into the communication of meaning and the communication of "intangible" or "ephemeral" values (Grgecic et al. 2015). The communication of meaning depicts how users may interpret the technologies' material properties and functionality (Markus and Silver 2008). Conversely, the communication of values depicts how users may judge or rate the technology's functionality related to their personal or structural values and norms (Grgecic et al. 2015). The meaning and value associated with the technical object emerge from the individual relationship between the user and technology (Goh et al. 2011). As a result, different narratives of technology are possible, given the unique relationship between the user and the technological artifact. These narratives can be positive or negative (or in-between) (Goh et al. 2011). For example, PA could be hailed as the next big evolution in human resources or a boring dystopia of surveillance and Taylorism. Symbolic expressions are formed before the first-ever use of technology. They change over time during and after use through an individual's agency or collectively through social structures such as shared norms and values (Goh et al. 2011). Recurring interactions between humans and technology can institutionalize symbolic expressions and beliefs. Eventually, recurring interactions lead to routinized actions and beliefs (Goh et al. 2011; Orlikowski 2000).

The interactions between technology and humans are illustrated in Figure 1. The technological objects communicate values and meaning, which the individual interprets. From the interpreted value and meaning of the technology, the individual derives functional affordances specific to their personal context and appropriates the technical object. Based on these functional affordances, the individual forms beliefs about the technology and puts the technical object to actual use, that is, the individual performs actions on the technology. Confrontation with the reality of using the technical object may alter the symbolic expressions, which determine, how an individual interprets the communicated values and meaning of the technological artifact (Grgecic et al. 2015).

Designers of PA might intend to embed different values than the users in companies interpret when interacting with the artifact because symbolic expressions are uniquely negotiated by individuals and user groups (Markus and Silver 2008). This difference can lead to unfulfilled expectations or misleading interpretations of PA, ultimately impacting the managerial decision on whether to adopt PA. As this study aims to unpack the beliefs on PA that affect the adoption decision, the symbolic expression lens is helpful. This theoretical concept has been used in other IS publications, for example, in Balci et al. (2014), Rosenkranz (2011), and Stein et al. (2013). However, empirical applications remain scarce.



Methodology

Research Approach

For the methodological approach, we chose qualitative expert interviews, following the guidelines by Myers and Newman (2007). The qualitative approach allowed us to investigate a real-life phenomenon in-depth and examine questions on the *why* and the *how* (Benbasat et al. 1987). The selected approach is an interpretive one as we follow the logic of multiple socially constructed realities and individual interpretations of PA. Furthermore, we choose expert interviews over case studies as we planned to unpack the phenomenon from distinct perspectives, with different stakeholders, and across multiple industries in contrast to investigating one or several cases in greater detail. The semi-structured nature of the interviews let the interviews flow naturally while ensuring comparability of the outcome (Myers and Newman 2007). With its open-ended questions, the interview guideline covered the building blocks of introduction, company setting, understanding of PA, use of PA, and perceived risks and benefits of PA. Before conducting the interviews, the research team discussed the guideline and pre-tested it with two experts.

Data Collection and Analysis

We collected data from German SMEs in two periods to account for the development of the IT artifact in PA, enabling us to examine changes in the perception of PA due to the novel working conditions caused by the pandemic. The first data collection with 15 interviews took place between July and August 2018. At that time, many SMEs were not using PA and had just started evaluating the technology. Six interviews had to be excluded from the analysis due to lacking knowledge of PA. Then, we conducted a second data collection resulting in 27 interviews between June and September 2021.

When approaching potential interviewees, we applied the following sampling criteria: 1) interviewees should either hold a higher management position or be members of PA teams, 2) they should work at an SME in Germany, and 3) they should either have made initial experiences with PA or be new to the topic. The third sampling criterion provided the opportunity to observe symbolic expressions before and after interacting with PA. Besides the (future) users of PA in SMEs, we extended the range of interview partners to four vendors of PA as we consider their view to be relevant compared to the users' perceptions. The vendors are the PA providers which many of our interview partners used. The interviews were conducted via video-conference solutions or the telephone and lasted between 30-45 minutes (see Table 1).

| ID | Position | Industry | Company Size | Use of PA | Functional affordances of PA | Time of interview |
|----|---------------------------|---------------|--------------|-----------|--|-------------------|
| 1 | CHRO | Utilities | 1500 | | n.a. | July 18 |
| 2 | CEO | Logistics | 500 | | n.a. | July 18 |
| 6 | CEO | IT Consulting | 150 | (x) | MS Power-BI | July 18 |
| 8 | Head of Marketing | IT Consulting | 150 | | n.a. | July 18 |
| 10 | Head Professional Service | IT Consulting | 150 | | n.a. | July 18 |
| 12 | Manager of Branch | Telecomm. | 200 | | n.a. | July 18 |
| 13 | HR Officer | Logistics | 200 | | n.a. | July 18 |
| 14 | Partner | IT Consulting | 150 | (x) | BI Tool | Aug 18 |
| 15 | CEO | IT Services | 300 | | n.a. | July 18 |
| 16 | Team Lead HR | Software | 1000 | x | Hiring, Onboarding | June 21 |
| 17 | Team Member PA | Software | 1000 | x | Hiring, Onboarding | July 21 |
| 18 | Team Lead PA | E-Commerce | 500 | x | Hiring, Performance Assessment, Talent Mgmt. | July 21 |
| 19 | Team Member PA | Media | 1500 | x | Workforce Planning, Performance Assessment | June 21 |
| 20 | Team Lead HR | Finance | 500 | x | Workforce Planning, Hiring | June 21 |
| 21 | Team Member PA | Finance | 1500 | x | Workforce Planning, Churn Management | June 21 |
| 22 | Team Member PA | Manufacturing | 1500 | x | Workforce Planning, Churn Management | June 21 |
| 23 | PA Consultant | Consulting | 500 | x | All Fields | July 21 |
| 24 | PA Consultant | Consulting | 100 | x | All Fields | July 21 |
| 25 | Employee R&D | Software | 50 | x | Hiring, Onboarding | June 21 |
| 26 | CEO | Software | 50 | x | Workforce Planning, Churn Management | July 21 |
| 27 | CEO | Software | 10 | x | Workforce Planning, Hiring, Talent Mgmt. | July 21 |
| 28 | Co-CEO | Software | 10 | x | Predictive Analytics | June 21 |
| 29 | Manager of Branch | Consulting | 200 | x | Descriptive Analytics | July 21 |
| 30 | Head of HR | Consulting | 200 | x | Descriptive Analytics | July 21 |
| 31 | Manager of Branch | Consulting | 200 | x | Descriptive Analytics | July 21 |
| 32 | Consultant | Consulting | 200 | x | Descriptive Analytics | July 21 |
| 33 | Consultant | Consulting | 200 | x | Descriptive Analytics | July 21 |
| 34 | Team Lead | Services | 50 | x | Descriptive Analytics | July 21 |
| 35 | Head of HR | Services | 50 | x | Descriptive Analytics | Aug 21 |
| 36 | Team Lead | Services | 50 | x | Descriptive Analytics | Sep 21 |
| 37 | Head of HR | Retail | 400 | x | Descriptive, Prescriptive | July 21 |
| 38 | Employee HR | Retail | 400 | x | Descriptive, Prescriptive | Aug 21 |
| 39 | Head of HR | Manufacturing | 400 | x | Employee Surveys | Aug 21 |
| 40 | Head of HR | Manufacturing | 400 | x | Employee Surveys | Sep 21 |
| 41 | Head of HR | Health | 150 | x | Descriptive Analytics | Aug 21 |
| 42 | Head of Area | Health | 150 | x | Descriptive Analytics | Sep 21 |

Table 1. Overview of Interview Partners

The interviews were recorded, anonymized, and transcribed verbatim (Saldaña 2016). We conducted two coding cycles using the software Atlas.ti to analyze the data. The coding followed an abductive approach (Dubois and Gadde 2002). In the first coding cycle, the research team developed a tentative coding scheme which resulted in 69 codes. Theoretical coding was applied in the second coding cycle as a follow-up as prior knowledge cannot be fully excluded even in interpretive approaches. Thereby, the number of codes was reduced to 30, and different themes like “positive symbolic expressions of people analytics”, “negative symbolic expressions of people analytics”, and “context factors”—including organizational, technological, and human framing conditions for the use of PA—emerged from the codes. An example of the coding scheme can be found in Table 2. In the following, all used quotes were translated into English.

| Theme | Code | Exemplary quote |
|--------------------------------|---------------------------------|--|
| Data analysis and applications | Better quality of data | “The great advantage of people analytics is the standardized approach for data handling. That is something humans are not able to do with a great amount of data.” (ID 38) |
| Negative SE for employees | Higher ethical/privacy concerns | “But what if you have a warning signal ‘Attention, this is a female, 30 years, no kids’? I think that would be unethical.” (ID 42) |

Table 2. Examples for the Coding Scheme

Findings

Symbolic Expressions of People Analytics

We derive and aggregate the symbolic expressions from the analyzed qualitative interviews. Markus and Silver (2008) state that symbolic expressions differ between user groups. Thus, in Table 3, we differentiate between users and non-users of PA, managers, employees, and vendors and derive different themes.

The theme of *data analysis and applications* emerged, in which interviewees value the broad range of applications. Due to the integration of many data sources, PA raises overall data quality and data quantity. Without PA, “the problem at the moment is that there are many tools and many data pools, and they are very dispersed. So, we are building a tool, which defines the new standard [...] as a data layer” (ID 25). Thus, PA abstracts low-level data and facilitates “dashboards from the birds’ eye” (ID 6). It provides holistic overviews: “people analytics always contains a cockpit with the most important information for lazy managers, so they can retrieve all important insights within 90 seconds in an integrated way” (ID 28).

Positive effects are mentioned at the employee level, the manager level, and the organizational level. All stakeholders can benefit from PA as “it is a reference tool for employees and managers” (ID 37) that can address “different types of questions” and insights due to its malleability (ID 1). PA is perceived to increase organizational knowledge because “team leaders can get insights and learn what they have to do” (ID 15). For example, PA assists organizations in workforce development and planning by informing hiring and retention decisions: “If PA helps only to retain one single employee, then it is already worth it” (ID 2). More generally, the organizations believe that PA increases overall productivity as it answers questions such as “How much costs did we save? How much time did we save?” (ID 16). Employees benefit from personal development plans and their well-being being monitored via “monthly team satisfaction surveys” (ID 42). Managers and employees value these surveys: “Indeed, it is crucial to know if an employee is healthy if the job puts too much pressure on him or her. And I highly value the opportunity of PA to see employees grow and develop” (ID 14). Managers underline how PA assists in improving employees’ work-life balance: “I check all 300 monthly timesheets to see if there are any huge outliers, contact managers and employees and say: ‘Watch out, there were five days in the month where the employee worked ten hours. That’s not good. So please make sure that you fix that.’ [...] So that’s what I’m aiming for from a personal point of view, in the direction of work-life balance” (ID 37). Therefore, PA can be seen as a safety anchor for employees to stand up for their well-being.

| Themes | Symbolic expressions | Stakeholder groups | | | | |
|---|---------------------------------|------------------------------|---|--|--|-----------------------|
| | | Users (ID 6,14, 16-42) | Non- Users (ID 1, 2, 8, 10, 12, 13, 15) | Managers (ID 1, 2, 6, 8, 10, 12-16, 18, 20, 29- 31, 34-37, 39-42) | Employees (ID 17, 19, 21, 22, 32, 33, 38) | Vendors (ID 25-28) |
| Data analysis and applications | Better malleability | | X | | | |
| | Better abstraction, overview | | X | | | X |
| | Better quality of data | X | X | X | X | X |
| | Increased quantity of data | X | X | X | X | X |
| Positive SE for managers | More evidence-based decisions | X | X | X | X | X |
| | Rising transparency | X | X | X | X | |
| | Improved control & power | X | | X | X | X |
| | Better leadership | X | X | X | X | X |
| Positive SE for employees | Higher growth and well-being | X | X | X | X | |
| | Increased motivation | | X | | | |
| | Stronger social relationships | | X | | | |
| | More effective staffing | X | X | X | | X |
| Positive SE for organizations | Increased orga. knowledge | | X | | | |
| | Increased performance | X | X | X | X | X |
| | Increased orga. productivity | X | X | X | | X |
| | Increased continuity | X | X | X | | X |
| | Earlier predictions | | X | | | X |
| | Better communication | X | X | X | | X |
| | Improved privacy assurances | | | | | X |
| Negative SE for managers | Decreased managerial control | | | | | X |
| | Questionable validity | X | X | X | | X |
| Negative SE for employees | Higher ethical/privacy concerns | X | X | X | X | X |
| | Lower trust | X | X | X | X | |
| | Increased employee stress | X | | X | X | |
| | More surveillance | X | X | X | X | |
| Organizational uncertainties | More technical difficulties | X | X | X | X | X |
| | More difficult legal compliance | X | X | X | X | X |
| | More transparency | X | X | X | X | |
| | Increased unintended effects | X | | X | X | |
| | Value proposition unclear | | X | | | X |
| Table 3. Symbolic Expressions of PA for Stakeholder Groups | | | | | | |

PA is attributed to facilitating more objective, data-driven leadership. Managers agree that “data-driven HR is making you achieve more accurate decisions” (ID 35). The technical artifact is “not only a pure management system” (ID 39), and it replaces “the gut feeling: [managers] can scientifically prove the efficiency of the company and their decisions” (ID 9). The credibility combined with novel insights can “certainly bring forth many new ideas and new possibilities and ways of looking at people” (ID 9). These new ideas can be “included in the feedback” (ID 34) when conducting employee appraisals or feedback conversations. PA can help continuously monitor KPIs due to automated processes of data analysis, reporting, and partial decision-making: “some want the process to be quick, automatic. The decision should get much easier” (ID 25). The predictive nature of these analyses allows anticipating events by establishing an “early warning system” (ID 40).

In contrast, *negative symbolic expressions* are highlighted, too. Managers, especially those who have not yet implemented PA, express the risk of technical difficulties and challenging legal compliance. “It may be a bit difficult to collect the data that I need in order to be able to make a well-founded decision based on the data” (ID 2), and even if data are available, there is “the danger that over time data garbage arises” (ID 24). Thus, the validity of the technical artifact is questioned. PA is assumed to come with “massive data protection issues” (ID 12). Rising transparency is mentioned as a double-edged sword: “transparency is the guarantor of justice and fairness (ID 15)”. However, the risk of “employee[s being] virtually transformed into a data object” (ID 20) is pointed out. For PA to succeed, it is crucial to stress employees’ benefits by assuring: “I’m not installing a camera like at the checkouts at a supermarket, but I want to make a positive difference” (ID 2). A manager underlines the aspect of communicating the value to employees: “I think that’s where we have to be very sensitive because many people probably feel controlled or monitored rather than recognizing the benefit. If we could turn it around and say we have gained the following insights from this data and we create something that is beneficial for the employee as a result of these analyses, then I can imagine that it would be more likely to be adopted” (ID 16).

Many interviewees state *uncertainty* and are not sure how to assess PA. They are overwhelmed by the functional affordances and the numerous solutions on the market: “There is an incredible number of different vendors with different focuses” (ID 24). Moreover, “from the outside, many systems appear similar, but if I have no statistical knowledge and if I am overwhelmed by buzzwords like AI, it will be quite difficult to make decisions [on the implementation of people analytics]” (ID 28). Due to lacking digital capabilities, “[i]t is sometimes difficult to understand what technology can and cannot do. The first challenge is certainly to clarify these expectations and understand what is possible with the technology.” (ID 27). Therefore, the beliefs about PA vary significantly, and it is difficult to draw a clear picture of the general impressions of PA.

Contrasting User Groups

Due to the heterogeneous beliefs, we provide more insights into the distribution of beliefs among different stakeholder groups. The stakeholders share positive beliefs about PA, such as “better quality of data”, “increased quantity of data”, “more evidence-based decisions”, “better leadership”, and they agree on the risks of “privacy issues” and “difficult legal compliance”. However, we perceive that the stakeholder groups weigh positive and negative beliefs differently.

As the primary target group of PA, managers highlight the benefits of the technology. The multi-sided transparency is assessed positively, and the technologies are framed to support employee well-being instead of employee surveillance. Managers conduct a cost-benefit analysis before implementing PA, and although they are aware of the risks of PA for their employees, the benefits outweigh the risks. They are optimistic that “they can handle the risks” (ID 37) and that they “are doing something good for [the] employees after all” (ID 2). Conversely, they mention the threat of losing power themselves as algorithms might replace their knowledge and experience and as “AI could take their jobs” (ID 27).

The vendors of PA frame their value proposition to meet the decision-makers’ needs. Still, they mention potential negative perceptions by employees and try to transform them into positive ones. For example, the vendors aim to invalidate privacy concerns by providing assurances that “data are anonymized, pseudonymized, and aggregated” (ID 28).

Finally, the risks, such as being monitored and feeling stressed, are more clearly articulated by employees. Yet, some employees draw positive images and state the opportunity of being empowered and experiencing better leadership due to PA. The expressions of users and non-users are similar. What keeps non-users from adapting PA is the uncertainty and unclear value-proposition rather than the negative impression of the technology.

Arising Challenges

The heterogeneity in beliefs causes several challenges for SMEs. The vendor introduces PA to the company: “We as the vendor are in charge of the overall communication” (ID 28). Thereby, the vendor takes the role of bridging the technical system and the organization’s social system and communicates certain features of PA via the value proposition of the technology. “People really need to be able to see what the added value is” (ID 19). In this process, personal factors play a crucial role as “humans purchase from humans and the

gut feeling matters a lot” (ID 27). Therefore, the providers’ assumptions are embedded into the technology and manifest in the technology’s communicative possibilities besides the pure functionality. The functionality’s interpretation by employees and managers, however, can deviate from the vendor’s intention. Thus, as challenge 1 we derive: During the sales process, the challenge of miscommunications between vendor and user of PA can occur.

Symbolic expressions emerge based on the interaction between vendors, employees, and managers, shaped by an individual’s values and norms. Hence, they might differ between user groups as individuals may appropriate the technology differently based on their interpretation. Managers express uncertainty at this stage: “You see people analytics and say ‘Cool, we want to have that!’ but then you have to check first: Do you need this?” (ID 23). The second identified challenge is: The functional affordances of PA are perceived distinctly according to the user groups.

Functional affordances differ between managers and employees: managers intend to use different dashboards and features than employees. We derive challenge 3 that is mismatching perceptions: “not every goal is comprehensible to everyone and attractive to everyone” (ID 40). To overcome this challenge, one interviewee argues that only the management’s symbolic expressions and functional affordances need to be considered as “the implementation of PA is a top-down process and would not work bottom-up” (ID 28). However, ignoring the conflicting perception of employees can endanger the successful implementation of PA: “If there is a steering committee and another consultancy, then the real end-user group is often left out and gets a pre-configured solution where all the other stakeholders agree ‘they will like it’, but the acceptance is low because it is imposed” (ID 27). Therefore, managers should take the broad set of distinct symbolic expressions into account when they derive their actions.

The organizational framing conditions such as leadership, culture, and social structure play a crucial role in forming symbolic expressions and their translation into actions. Depending on the organization’s structures, the technical object’s malleability offers a broad action space rather than deterministic use cases: “For what you use [PA] then, whether you use it ‘evil’ or super ‘Buddhist’, that is always up to the company” (ID 31). Hence, we identify challenge 4: The contextual factors of an organization might be misaligned with the intended use of the technical artifact.

Finally, the interview partners agree that the formation of symbolic expressions—with the resulting actions and beliefs—is a complex, ongoing cycle: “What do you mean by leveraging full potential in the case of people measures? It is a never-ending story. You are never done, and it is a continuous process” (ID 28).

Influence of SMEs’ Context on the Formation of Symbolic Expressions

As another reoccurring theme, the influence of SMEs’ contextual factors was considered important in negotiating symbolic expressions. To account for SMEs’ characteristics, the interviewees pointed out specifics like the company size, the industry, and degree of digitalization, the structure of the HR department, employees’ competencies, and the company’s culture.

First, the interviewees assessed the company’s size as decisive for the perceived value of PA: “If I have a small organization with five or six people, then the question arises as to how large the people analytics system needs to be” (ID 27). Another vendor of PA agrees: “PA is particularly relevant for companies where personnel costs account for a very high proportion of total costs. Otherwise, implementing such a system would make little sense. [...] What often leads to the decision to implement PA and can be an opportunity are companies with many heterogeneous systems. These often have the urge to change something, consolidate and streamline data, for which PA projects are then used.” (ID 26)

Second, tech-affine SMEs have slightly more positive associations for PA as “[they] look at millions of data every day” (ID 16) and “data are in [their] DNA” (ID 18). In contrast, if the companies’ digitalization degree is too low, this is a limiting factor. These companies are unsure if they have the capabilities and skills to implement PA. Consequently, vendors of PA focus on non-tech-affine industries as their potential customers, and “[they] do not devote for other branches like the public sector” (ID 25).

Third, the structure of the HR department is essential as it determines the potential users of PA and the implementation process. Some SMEs have designated PA teams. However, the responsibilities of the teams vary drastically. Some PA teams see their role as: “We provide the figures. The people who run the department must find out what the problem is and investigate it themselves” (ID 22). On the contrary, other

managers do not want to use PA: “I just want to have a new team member, so why should I have to deal with such nonsense? That’s the job of the recruiting team” (ID 17). Due to the unclear distribution of responsibilities, the symbolic expressions are inconsistent within these firms.

Lastly, SMEs’ culture and mindset determine the perceived values of PA as “it’s just a matter of attitudes. How open am I to new things?” (ID 27). Implementing PA requires “a completely different delivery model and a great cultural change” (ID 19) that may be difficult to conduct for traditional SMEs. Only if the culture is adapting, the potential of PA can be released. Otherwise: “expectation and reality might differ. [SMEs] might purchase something they cannot use adequately, which does not make sense” (ID 28) and leads to negative symbolic expressions. On the flipside, “strong concerns [about] company culture” are raised if PA is implemented incorrectly. Taking the boundary conditions of SMEs into account, these hamper the implementation of PA. As a result, many interviewees identify numerous negative effects of PA. However, many still believe in the potential of the technology and, despite uncertainties, decide to implement PA.

Discussion

Beliefs on People Analytics

Our findings are in line with the beliefs on PA that are discussed in the conceptual literature; for example, the benefits of data-driven decision-making on productivity, fairness, and organizational knowledge, applied in hiring, retention, or workforce development (Levenson and Fink 2017; Tursunbayeva et al. 2021). The negative aspects such as surveillance, ethics, privacy (Gal et al. 2020), and concerns about data quality and analytical validity are empirically evidenced (Hüllmann et al. 2021). Moving beyond the common beliefs, we emphasize increased continuity in measuring and monitoring the workforce as well as the malleability of PA. Besides hiring and retention, the data showed that PA provides insights for employee appraisal and feedback conversations, providing novel talking points that were unfeasible before due to relying on intuition and experience only. We find that managers are uncertain whether PA will increase control due to more fine-grained and data-driven insights, or if managers lose power due to not being able to decide freely based on intuition, as having evidence becomes mandatory.

The results show how beliefs about PA are formed for stakeholder groups. It is not as simple as vendors and managers advocating for PA while employees resist the technology (c.f. Giermindl et al. 2021; Kloepper and Koehne 2022). Instead, managers and employees both consider the other group’s perspective, respectively, which, however, may lead to misaligned assessments. Therefore, it is vital to understand how the beliefs are formed that lead to the misalignments and how symbolic expressions, functional affordances, and beliefs are updated and influenced between stakeholder groups. We identified four challenges in this context. These four challenges and the underlying influence mechanisms cannot be explained with only the interactions between an individual and the technology (Grgecic et al. 2015). Therefore, we extend the original theory by stakeholder groups (see Figure 2). We start by explaining the cycle of how symbolic expressions emerge, highlighting the challenges that hinder the successful adaptation of PA in SMEs.

Formation of Symbolic Expressions between Stakeholders

Challenge 1: Miscommunication from the vendor to management and employees. In the first step, the vendor introduces the technology, bridging from the technical system to the organization’s social system. The vendor communicates the values of the technology via manuals, documentation, and advertising the features. Ongoing negotiation cycles between technology and individuals emerge for managers and employees that shape how beliefs are formed. The individuals interpret the technologies’ material properties and functionality within their social context (Markus and Silver 2008) and judge the technology’s functionality related to their personal or structural values and norms (Grgecic et al. 2015). The judgment is influenced by the vendor positively framing the technology, trying to invalidate concerns by framing concerns positively, or providing assurances. Yet, symbolic expressions emerge individually between user and technology, so the interpretations between vendor, manager, and employee can differ (Goh et al. 2011; Leonardi and Barley 2010).

The second step is the central step for our extension to the original theory (Markus and Silver 2008). The individual interprets the communicated value and meaning of the technology and derives functional affordances specific to their personal context (Markus and Silver 2008). By appropriating the technology,

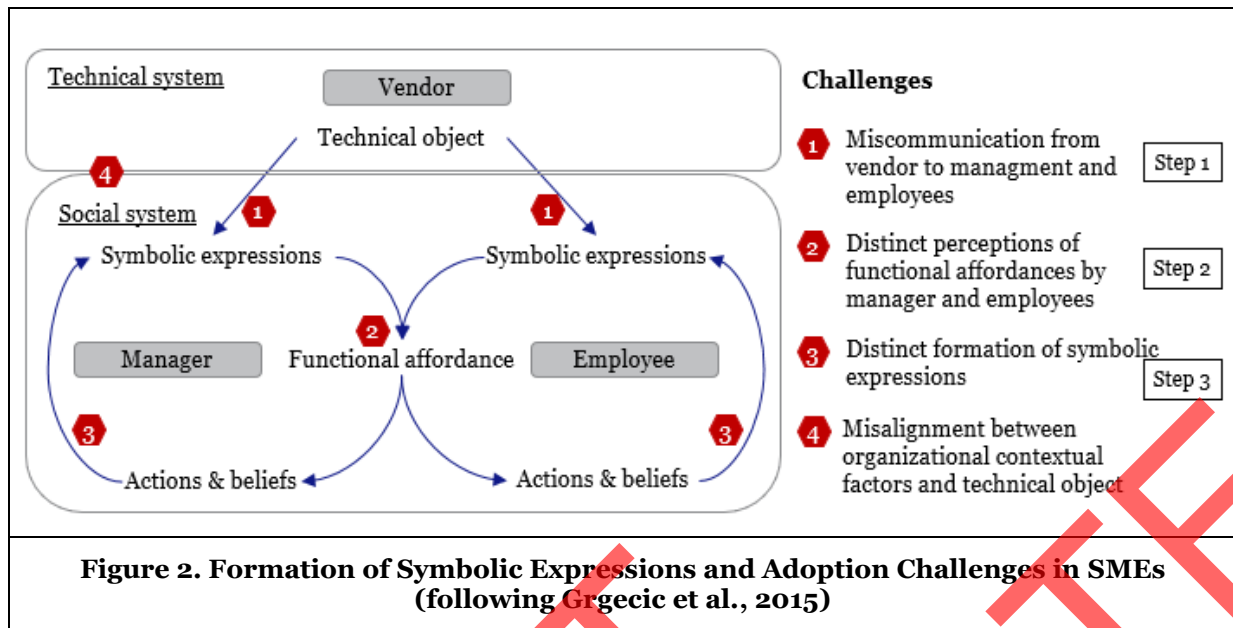
an individual derives an action potential, that is, a hypothetical situation in which the individual would use the technology with a purpose. However, from the interpretation of value and meaning, the individual cannot only derive a functional affordance for themselves but also for their managers, that is, another user group. Thus, from the communicated value and meaning, the employee derives how management would apply the technology with a purpose, interpreting how the manager's application would affect the employee. Conversely, the opposite is possible as well. We label this phenomenon a third-party functional affordance. Third-party functional affordances extend the dyadic conversation between individual and technology to a "listen-in" to other people's conversations. (Grgecic et al. 2015; Markus and Silver 2008)

Challenge 2: Distinct perceptions of functional affordances by managers and employees. Third-party affordances can explain how a symbolic expression informs the perceived functional affordance of another user group. The direct relationship between technical object and functional affordance is obsolete, as it is fully mediated through symbolic expressions that emerge between user groups (Grgecic et al. 2015). As the formation of symbolic expressions happens in the context of personal and social values and norms, the derived third-party functional affordances may differ from how the other user group derives their own respective affordances. For example, the manager's functional affordance is different from how employees think the manager's affordance would be, resulting in misalignment.

Challenge 3: Distinct formation of symbolic expressions. In the third step, the individual forms beliefs about the technology and puts the technology to actual use (Leonardi and Rodriguez-Lluesma 2012). Confrontation with the reality of using the technology may alter the symbolic expressions, that is, how an individual interprets the communicated values and meaning (Goh et al. 2011; Grgecic et al. 2015). Symbolic expressions change over time during and after use through an individual's agency (Goh et al. 2011). This change recurs in a cycle and eventually leads to routinized actions and beliefs (Goh et al. 2011; Orlikowski 2000). However, beliefs can be formed without an individual using the technology themselves. We can explain how other stakeholder groups' actual use affects forming beliefs via third-party functional affordances. The actualization of these third-party functional affordances by others shapes the beliefs and explains how other people's technology use can update an individual's symbolic expressions. As a result, we learn that symbolic expressions are not only negotiated between an individual and technological artifact (Grgecic et al. 2015), but three-way interactions are possible. In our case, the manager or the employee is the third party. As individuals have idiosyncratic personal norms and values (Jones 2014), the same actions may lead to different updates of the symbolic expressions. Both the initial interpretation of values and meaning from the technological artifact and the new actions are interpreted individually, ultimately leading to varying symbolic expressions (Grgecic et al. 2015). It is possible that through the update cycle, the actions and beliefs are routinized (Orlikowski 2000) but do not converge. Despite running through the cycle multiple times, emergent symbolic expressions remain different for stakeholder groups.

Challenge 4: The contextual factors of an organization might be misaligned with the intended use of the technical artifact. Lastly, the context of SMEs showed that contextual factors play a big role as an overarching factor that moderates the outlined process of how symbolic expressions are formed and updated. The organizational characteristics such as company size or industry set the frame and boundaries in which the formation of beliefs happens. The organizational culture and, subsequently, shared norms and values of the organization influence how first- and third-party functional affordances emerge. In the original symbolic expressions theory, it might happen that structural values in the organization ostracize the communication of value to such an extent that the (negotiation) cycle cannot start because the technology will never be put into use. Consequently, the individuals do not appropriate and act upon the technology, and they cannot update their symbolic expressions (Grgecic et al. 2015). However, following our extension of the theory, other user groups can appropriate the technology and put it to use, from which the first-party individual not using the technology can update their beliefs. From the previous assertion follows that symbolic expressions can emerge at any step in a technology's adoption cycle. Thus, a strict separation of different steps has little merit for understanding how individuals form beliefs about technology. Instead, we posit that the three adoption phases by Leonardi and Barley (2010) are inseparable¹. They can recur in the negotiation cycle sequentially or simultaneously. The latter happens when individuals update their beliefs through third-party functional affordances and actions.

¹ We acknowledge that this argument is too brief. However, the space is too limited for a fully fleshed out argument regarding the ontological assumptions underlying the symbolic expressions' (negotiation) cycle.



Conclusion

This empirical paper investigates how symbolic expressions of PA shape the users' perceptions of the technology. We identified three key themes by conducting a qualitative inquiry with 36 interviews. First, many beliefs are characterized by uncertainties surrounding PA functional affordances, value propositions, and risks. Second, the beliefs vary between different stakeholders and are mutually shaped. Third, we identified perceptions that are driven by the contextual factors of small- and medium-sized enterprises.

Theoretical and Practical Contribution

We contribute theoretical insights to the discourse on PA and how users form their beliefs about PA artifacts. Our study is one of the first empirical studies on PA, applying the symbolic expressions lens. Our contributions are grounded in empirical data from SMEs, but the insights generalize to other types of organizations. We refine the existing symbolic expressions by shedding light on which expressions emerge for which stakeholder. Using an interpretive approach, we contribute important insights into how symbolic expressions theory can be extended to explain the formation of symbolic expressions in multiple stakeholder settings. We find that symbolic expressions and functional affordances must be examined together. Symbolic expressions are mutually influenced between different users and groups of users. Specifically, we propose three-way interactions between technology, individual, and third-party users. We theorize how beliefs are formed and updated given an individual's own use or third-party appropriation of technology. Furthermore, we add theoretical insights about the link between beliefs before and after use, showing the inseparability of single adoption steps (Leonardi and Barley 2010).

For practical implications, managers should consider the broad set of distinct symbolic expressions when implementing PA, taking into account the positive and negative effects. Managers should be aware that their perceptions of technology, particularly PA, may differ from their employees. As a result, we recommend planning and implementing decisions surrounding PA jointly with employees and considering the different beliefs on PA. Realizing that beliefs between first-party and third-party use may differ, we suggest fostering conversations between stakeholders and aligning perceptions upfront. The adoption steps cannot be separated into stages such as before and after-use but must be considered jointly as an ongoing cycle. Therefore, continuous conversations about the technology must be established. Accountability for the negative effects should be set up to address employee concerns. Vendors frame PA positively, yet how technology is interpreted may differ significantly between user groups. Thus, we recommend developers of PA to derive the requirements from diverse user groups and test the artifact in different settings.

Limitations and Outlook

Despite being thoroughly conducted, this research comes with certain theoretical and methodological limitations. We use the theoretical lens of symbolic expressions to interpret the perception of PA in SMEs. This concept is well established in IS research and assists in analyzing the phenomenon at the team- and individual-level. However, we encourage further research into the individual level, adding a socio-psychological perspective that uncovers deeper processual insights about interindividual influence mechanisms. On the organization level, investigations on cultural changes and new management practices due to the implementation of PA would add further insights on the implications of adopting PA.

Methodologically, the sample is limited to German SMEs. We purposefully selected experts from multiple organizations to collect data from different industries and perspectives; however, gaining in-depth insights into single cases would be valuable to inform the aforementioned processual insights. The experience of the interview partners with PA varied drastically, which might have caused biases in their answers and could cause different perceptions of the artifact. We accounted for the diverse backgrounds of the interviewees by defining PA in the interviews. To overcome the methodological limitations, we suggest future research investigating the formation of beliefs on PA in longitudinal single case studies and across different cultural contexts. Accompanying an organization from the initiation of PA to its implementation and use could demonstrate how the beliefs unfold over time and impact actions. In such studies, the vendor's perspective could be carved out more thoroughly. Finally, we consider this work a stepping-stone towards more empirical investigations on PA and strongly encourage more studies in this field.

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