

# Can support by digital technologies stimulate intrapreneurial behaviour? The moderating role of management support for innovation and intrapreneurial self-efficacy

Tanja Rabl<sup>1</sup>  | Valentin Petzsche<sup>1</sup>  | Matthias Baum<sup>2</sup>  |  
Sonja Franzke<sup>2</sup> 

<sup>1</sup>Chair of Human Resource Management, Leadership, and Organization, Technische Universität Kaiserslautern, Kaiserslautern, Germany

<sup>2</sup>Chair of Entrepreneurship and Digital Business Models, University of Bayreuth, Bayreuth, Germany

## Correspondence

Tanja Rabl, Chair of Human Resource Management, Leadership, and Organization, Technische Universität Kaiserslautern, P.O. Box 3049, 67653 Kaiserslautern, Germany.  
Email: [tanja.rabl@wiwi.uni-kl.de](mailto:tanja.rabl@wiwi.uni-kl.de)

## Abstract

Drawing on theorising on digital technologies as external enablers of entrepreneurial activities and an interactionist perspective on corporate entrepreneurship, this article examines the relationship between digital technology support and employee intrapreneurial behaviour. We propose that management support for innovation as an organisational characteristic and intrapreneurial self-efficacy as an individual characteristic moderate this relationship. Findings from a metric conjoint experiment with 1360 decisions nested within 85 employees showed that support by social media, support by collaborative technologies, and support by intelligent decision support systems were significant predictors of employee intrapreneurial behaviour. However, the relative impact of support by these digital technologies varied with different levels of management support for innovation and intrapreneurial self-efficacy.

## KEYWORDS

conjoint experiment, digital technology support, intrapreneurial self-efficacy, intrapreneurship, management support for innovation

This is an open access article under the terms of the [Creative Commons Attribution](https://creativecommons.org/licenses/by/4.0/) License, which permits use, distribution and reproduction in any medium, provided the original work is properly cited.

© 2022 The Authors. *Information Systems Journal* published by John Wiley & Sons Ltd.

## 1 | INTRODUCTION

In times of digitalisation, organisations face enormous pressure to reflect current business strategies and explore new business opportunities. Confronted with these challenges, intrapreneurship, which is defined as entrepreneurship within an existing organisation that is initiated by employees<sup>1</sup> (Blanka, 2019), is key to organisational renewal and survival. Organisations thus need to know how intrapreneurial behaviour can be stimulated in their employees (Hornsby et al., 2002). At the same time, digitalisation brings along an exponential rise in the capabilities of digital technologies (Adomavicius et al., 2008), defined as ‘products or services that are either embodied in information and communication technologies or enabled by them’ (Lyytinen et al., 2016, p. 49). Digital technologies lead to the emergence of opportunities that spark new economic activity (Roberts, 1991; von Briel et al., 2021) and can be leveraged for designing innovative and sustainable solutions (Parth et al., 2021; Qureshi et al., 2021). Against the backdrop of these emerging trends, we integrate the information systems and digital entrepreneurship literatures with the intrapreneurship literature to answer the question if and under which conditions support by different types of digital technologies enable employee intrapreneurial behaviour. We thereby focus on support by social media, support by collaborative technologies, and support by intelligent decision support systems.<sup>2</sup>

The information systems and digital entrepreneurship literatures (e.g., Abubakre et al., 2021; Berger et al., 2021; Gustavsson & Ljungberg, 2018; Nambisan, 2017; Steininger, 2019; von Briel et al., 2018) have begun to postulate digital technologies as external enablers of entrepreneurial activities. Within these burgeoning research streams, scholars have put their main attention on analysing the organisational level and on examining how digitalisation affects entrepreneurial activities outside existing corporations (e.g., Abubakre et al., 2021; Nambisan et al., 2019; Steininger, 2019; Venkatesh et al., 2017), neglecting the individual-level implications of digital technologies on employees’ intrapreneurial activities. This is quite astonishing, given that the intrapreneurship literature has highlighted the importance of examining the determinants of individual intrapreneurial behaviour (e.g., Blanka, 2019; Hornsby et al., 2002; Kuratko et al., 2005). Accordingly, enhancing understanding at this frontier is a relevant endeavour because digital technologies may enable intrapreneurial behaviour by making it easier to invent new methods to create, deliver, and capture value for actors in existing organisations (Autio et al., 2018; Nambisan et al., 2019; Steininger, 2019). Given that intrapreneurs act within a different context than entrepreneurs (Blanka, 2019; Parker, 2011) and that intrapreneurial behaviour and entrepreneurial behaviour have different antecedents (E. J. Douglas & Fitzsimmons, 2013; Parker, 2011), our study extends the information systems and digital entrepreneurship literatures by theorising and empirically examining the relationship between digital technology support and employee intrapreneurial behaviour. We thereby integrate the individual and organisational level perspective and advance previous studies by switching the focus from entrepreneurship to intrapreneurship.

Our article builds on recent conceptual work by von Briel et al. (2018) on digital technologies as external enablers of entrepreneurial activities and draws on an interactionist perspective on corporate entrepreneurship (Hornsby et al., 1993). In this vein, we argue that specific organisational conditions that are aligned with technological developments in the external environment of the organisation—such as digital technology support—provide an impetus to engage in intrapreneurial behaviour (see Kuratko et al., 2004) and that this impetus is contingent upon further organisational and individual characteristics. On that basis, we examine interactions of digital technology support with management support for innovation (as an organisational characteristic) and intrapreneurial self-efficacy (as an individual characteristic). Both management support for innovation (e.g., Hornsby et al., 2009) and intrapreneurial self-efficacy (e.g., Globocnik & Salomo, 2015) play a role regarding employee intrapreneurial behaviour and are likely to foster the recognition and usage of the opportunities for intrapreneurship enabled by digital technology support.

By considering both organisational and individual characteristics as contingencies, our study offers valuable clues regarding the question under which conditions digital technology support enables employee intrapreneurial behaviour. With this, we add to theorising in the digital entrepreneurship literature about digital technologies as enablers of entrepreneurial activities and extend first empirical findings (e.g., Baum & Rabl, 2019) on contingencies of the

enabling role of digital technologies regarding intrapreneurial behaviour. In addition, our study provides an empirical test of interactive effects on employee intrapreneurial behaviour as proposed by Hornsby et al.'s (1993) interactive model of corporate entrepreneurship and thus also contributes to the intrapreneurship literature.

Finally, our study makes an important contribution to managerial practice. It provides organisations with insights into which digital technology infrastructure can help foster employee intrapreneurial behaviour under which conditions.

## 2 | LITERATURE REVIEW

### 2.1 | Employee intrapreneurial behaviour

Research has emphasised that intrapreneurship does not only happen on the organisational level, but traces back to individual-level behaviour (Blanka, 2019; Gawke et al., 2019; Moriano et al., 2014; Neessen et al., 2019). Gawke et al. (2017) define employee intrapreneurial behaviour as ‘an individual employee's agentic and anticipatory behaviours aimed at creating new businesses for the organization (i.e., venture behavior) and enhancing an organization's ability to react to internal and external advancements (i.e., strategic renewal behavior)’ (p. 89). It is extra-role behaviour that is positive, voluntary, and not prescribed by the organisation (Neessen et al., 2019; Rigtering & Weitzel, 2013). It differs from other proactive extra-role behaviours such as innovative behaviour because it can foster an organisation's ability to leverage opportunities ‘departing from the customary’ (Antoncic & Hisrich, 2001, p. 498) even without creating new products, services, or processes (Gawke et al., 2018, 2019), which is the essence of innovative behaviour (Janssen, 2000). However, intrapreneurial behaviour is closely related to innovative behaviour, with both behaviours incorporating the aspect of newness (see Antoncic & Hisrich, 2003). Newness, in turn, is seen as a defining characteristic of intrapreneurial behaviour (see Kuratko et al., 2004). Intrapreneurs are entrepreneurial employees (Antoncic & Hisrich, 2001; Blanka, 2019; Gerards et al., 2021) who—in their intrapreneurial endeavours—proactively go beyond standard job descriptions, show persistence in overcoming obstacles, and take on risks in acting beyond conventional limitations and boundaries (Halme et al., 2012; Rigtering & Weitzel, 2013). They ‘possess the same entrepreneurial spirit as entrepreneurs’ (Hisrich, 1990, p. 209).

In contrast to entrepreneurs, intrapreneurs act within a given organisational context. This has both advantages and disadvantages. On the one hand, intrapreneurs can benefit from organisational resources and organisational support in their intrapreneurial endeavours and have limited financial risks. On the other hand, intrapreneurs may face obstacles due to restricting policies and regulations, reduced autonomy and control, limited rewards for intrapreneurial activities, and career risks in case of failure (Blanka, 2019; Gerards et al., 2021; Moriano et al., 2014). Moreover, E. J. Douglas and Fitzsimmons (2013) as well as Parker (2011) highlight that intrapreneurial and entrepreneurial behaviours are distinct and that both have different antecedents (e.g., risk tolerance is important for intrapreneurs, while income, autonomy, and ownership are more important for entrepreneurs).

The literature on the determinants of intrapreneurial behaviour has shown that both individual factors and organisational factors that constitute a favourable internal environment (see e.g., Hornsby et al., 2002; Kuratko et al., 1990) play a role in predicting intrapreneurship (for reviews see Blanka, 2019; Neessen et al., 2019). While research has started to carve out the singular effects of specific individual-level (e.g., intrapreneurial self-efficacy) and organisational-level variables (e.g., management support), previous studies mostly neglected examining how different determinants interact (Neessen et al., 2019).

According to Hornsby et al.'s (1993) interactive model of corporate entrepreneurship, the decision to act intrapreneurially results from an interaction between environmental or organisational changes, organisational characteristics, and individual characteristics. Kuratko et al. (2004) already suggested that the availability of digital technologies can be an organisational condition aligned with technological developments in the external environment of the organisation that triggers intrapreneurial behaviour. In their study, Baum and Rabl (2019) found that the effect of

organisational digital capital on employee likelihood to participate in a corporate new venture team is strengthened by ability-related and motivation-related individual factors. We build on these conceptual considerations and first empirical findings in our study, thus contributing towards illuminating the conditions under which employee intrapreneurial behaviour can be fostered by digital technology support.

## 2.2 | Digital entrepreneurship

Digital entrepreneurship is defined as the use of digital technologies to generate new possibilities for economic and social interactions (Abubakre et al., 2021; Nambisan et al., 2018). It 'includes ventures and transformation of existing businesses by creating novel digital technologies and/or novel usage of such technologies' (Shen et al., 2018, p. 1125). Thus, the core thought of digital entrepreneurship is that digital technologies affect new venture creation and processes (Sahut et al., 2021). As such, examining the mechanisms through which digital technologies affect entrepreneurial processes has received increasing attention within entrepreneurship and information systems research (Nambisan & Baron, 2021).

Steininger's (2019) literature review on digital entrepreneurship research showed that apart from being the outcome of entrepreneurial actions or the business model itself, digital technologies can spark entrepreneurial operations in two ways: on the one hand as facilitators supporting entrepreneurial activities and on the other hand as mediators connecting entrepreneurs with their clients. Conceptual work has further elaborated on the role of digital technologies as external enablers of entrepreneurial activities. While Gustavsson and Ljungberg (2018) identify characteristics of digital technologies that enable entrepreneurial undertakings, Autio et al. (2018) highlight digital affordances (i.e., action potentials of digital technologies; Majchrzak & Markus, 2013) that change the creation, delivery, and capturing of value and enable successful pursuit of entrepreneurial opportunities. In a similar vein, Nambisan et al. (2017) postulates that digital technologies make boundaries more fluid and agency less predefined and more dispersed, thus opening up entrepreneurial opportunities. Building on Nambisan's (2017) elaborations and in line with work on digital affordances, von Briel et al. (2018) propose a theoretical framework for explaining why digital technologies serve as external enablers of entrepreneurial activities.

The literature dealing with the enabling role of digital technologies regarding entrepreneurship largely adopts an organisational-level perspective (see e.g., Autio et al., 2018; Butler et al., 2020; Chalmers et al., 2021; Li et al., 2018; Ojala, 2016; Rosin et al., 2020; Sambamurthy et al., 2003), while research on the individual level is relatively scarce (see also the literature reviews of Steininger, 2019, and Zaheer et al., 2019). The few existing individual-level quantitative empirical studies on digital entrepreneurship mainly focus on digital technology usage and adoption (e.g., Barnett et al., 2019; Batool & Ullah, 2018; Venkatesh et al., 2017; Zenebe et al., 2018), providing first indications that digital technologies may foster individual entrepreneurial activities.

Compared to their role regarding entrepreneurship outside existing organisations, research has been rather silent on the enabling role of digital technologies regarding entrepreneurship in existing organisations. Focusing on the organisational level, quantitative empirical studies, for example, found entrepreneurial alert information systems (e.g., Simsek et al., 2009), an organisation's information technology capabilities (e.g., Y. Chen et al., 2015), and an organisation's digital technology usage (e.g., Yunis et al., 2018) to be beneficial for corporate entrepreneurship.

Up to date, however, there are only a few pioneer studies examining the role of digital technologies regarding entrepreneurial activities in organisations on the individual level. In their qualitative study, Arvidsson and Mønsted (2018) investigated the tactics that digital corporate entrepreneurs use to leverage the enabling potential of digital technologies. In their quantitative experimental study, Baum and Rabl (2019) found that an organisation's digital process and knowledge capital positively affected employee likelihood to participate in a corporate new venture team. They found this effect to be strongest when employees had high personal initiative and were highly digitally fluent. The work by Petzsche et al. (2022) combining a quantitative experimental study with qualitative interviews showed that digital affordances increased employee-perceived information technology support for innovation and decreased

employee-perceived work overload, which in turn fostered employee corporate entrepreneurship participation likelihood. Drawing on the conceptual considerations on the enabling role of digital technologies, our study contributes to this nascent research stream focusing on digital intrapreneurship on the individual level.

### 3 | THEORY AND HYPOTHESES

To analyse the question if and under which conditions digital technology support enables employee intrapreneurial behaviour, we integrate von Briel et al.'s (2018) conceptual work on digital technologies as external enablers of entrepreneurial activities with an interactionist perspective on corporate entrepreneurship (Hornsby et al., 1993). Based on recent theoretical considerations concerning the importance of agency and boundaries for entrepreneurial processes and outcomes (Nambisan, 2017), von Briel et al. (2018) develop a framework that conceptualises the role of digital technologies in venture creation. They identify two main dimensions along which digital technologies can be characterised: specificity and relationality (von Briel et al., 2018). Specificity describes the degree to which digital technologies allow control over inputs, transformations, and outputs. Highly specific digital technologies typically have limited options for reprogramming, while digital technologies with low specificity are less rigid and can be adapted to include new functions (von Briel et al., 2018). Relationality reflects the degree to which digital technologies allow connections and interactions with a large number of diverse actors (Kallinikos et al., 2013). Similar to specificity, the relationality of a digital technology can vary. While digital technologies with a low degree of relationality have a limited number of connections at a time, digital technologies with a high degree of relationality connect large numbers of diverse actors (von Briel et al., 2018).

As such, the framework developed by von Briel et al. (2018), focusing on variations of the specificity and relationality of digital technologies, depicts the 'enabling potential of any digital technology, regardless of whether it already exists or might emerge in the future' (p. 51). Based on these considerations, we posit that digital technologies can act as important enablers of intrapreneurship because they break up boundaries and increase the distribution of agency within organisations, encouraging extra-role behaviour and engagement in intrapreneurial activities (Nambisan, 2017; Neessen et al., 2019; Rigtering & Weitzel, 2013; von Briel et al., 2018).

#### 3.1 | Digital technology support as an enabler of employee intrapreneurial behaviour

To explore digital technology support as an enabler of employee intrapreneurial behaviour, we focus on different digital technology configurations based on the characteristics developed by von Briel et al. (2018). As such, we draw on digital technologies that differ strongly in their specificity and relationality to exemplify underlying mechanisms and provide a more comprehensive basis for theorising (Nambisan, 2017; von Briel et al., 2018). Hence, we focus on technologies that combine extreme ends of the control versus connectivity spectrum to tease out theoretical differences. The chosen combinations were thus selected as follows: low specificity and high relationality (social media), medium specificity and medium relationality (collaborative technologies), as well as high specificity and low relationality (intelligent decision support systems), allowing to cover a broad range of possible configurations, while also being practically relevant to our context. The three chosen digital technologies have been shown to play a vital role in innovative and entrepreneurial endeavours and are thus well-suited for the intrapreneurship context (see e.g., Dellermann et al., 2019; Martín-Rojas et al., 2020; Olanrewaju et al., 2020; Schneckenberg et al., 2015; Secundo et al., 2020).

Social media represent digital platforms that facilitate information sharing and connect large numbers of content creators simultaneously (Germonprez & Hovorka, 2013; McFarland & Ployhart, 2015; von Briel et al., 2018). Collaborative technologies are software applications that facilitate group work (Recker et al., 2013) by helping people organise their work (Doll & Deng, 2001) and 'coordinate interdependent actions for reaching common goals' (Shih

et al., 2015, p. 455). Intelligent decision support systems are ‘interactive computer-based systems that use data, expert knowledge, and models for aiding organizational decision makers in semi-structured problems incorporating problem-solving techniques of artificial intelligence’ (Sarma, 1994, p. 403). These support systems can thus improve decision-making and reduce biases (Blohm et al., 2016; Dellermann et al., 2019). In Table 1, we provide an overview over the classification of the three digital technologies along the specificity and relationality dimensions, underscoring their exemplary character in disentangling the effect of digital technologies on intrapreneurial activities. In the following, we outline how and why support by these digital technologies should enable employee intrapreneurial behaviour.

Social media are characterised by low specificity and high relationality (von Briel et al., 2018). They allow employees to establish connections and communicate with anybody in the organisation. They also offer employees the opportunity to create, manage, and share content and view all communication and content as well as related activities from all organisational members whenever they wish (Germonprez & Hovorka, 2013; Leonardi & Vaast, 2017; McFarland & Ployhart, 2015). Thus, social media allow low control over inputs, transformations, and outputs and a high number of connections and interactions with diverse actors (von Briel et al., 2018).

Due to their low specificity and high relationality, social media should provide a high potential for the expansion and substitution of resources and the creation of something new by combining different resources or changing the existing, which in turn should enable employee intrapreneurial behaviour (see von Briel et al., 2018). Through affording anyone to create content and share information, knowledge, and ideas (Leonardi & Vaast, 2017), social media increase the number of actors and the volume of available resources. They allow employees broad access to complementary resources that they can bundle with their own resources to create something new. Providing diverse actors with a forum for seeking, contributing, and brokering knowledge (Havakhor et al., 2018), social media substitute traditional sources of inspiration (Sigala & Chalkiti, 2015). This enriches and expands employees' cognitive abilities to perform complex innovation tasks (Sigala & Chalkiti, 2015) and facilitates the generation of new and creative ideas (Lam et al., 2016; Sigala & Chalkiti, 2015). As social media enable digital relations and make social networks transparent, they help employees broaden and deepen their networks as well as build, enhance, and maintain social capital (Smith et al., 2017). Social capital, as an antecedent of (corporate) entrepreneurial activities, helps in opportunity identification and realisation (Dess, 2003; Smith et al., 2017) and thus supports intrapreneurial behaviour.

Collaborative technologies are characterised by a medium level of specificity and a medium level of relationality (von Briel et al., 2018). They support project-based group work of diverse actors from different locations by enabling goal- and task-oriented communication, coordination of interdependent activities, and knowledge sharing (Bertolotti et al., 2015; Doll & Deng, 2001; Recker et al., 2013; Shih et al., 2015). Due to their goal and target group focus,

**TABLE 1** Classification of digital technologies

Digital technology	Specificity	Relationality
Social media	Low: Anybody in the organisation can create, manage, share, and view any content anytime → Low control over inputs, transformations, and outputs	High: Platform for social interaction that is open to anybody in the organisation → High number of connections
Collaborative technologies	Medium: Work group members create, manage, share, and view content to achieve their common goals → Certain degree of control over inputs, transformations, and outputs	Medium: Systems supporting collaboration that is limited to work group members → Number of connections limited to work group
Intelligent decision support systems	High: Controlled input results in controlled output through a formal decision model and solution method (algorithm) → Tight control over inputs, transformations, and outputs	Low: Systems supporting decision-making limited to one actor using the system at a time → Low number of connections

collaborative technologies allow a certain degree of control over inputs, transformations, and outputs as well as interactions within a work group (von Briel et al., 2018), which sets them apart from social media.

Because of their medium specificity and relationality, collaborative technologies should not only offer opportunities to expand and substitute resources and create something new by combining different resources or changing the existing, but also should allow for saving time and resources (see von Briel et al., 2018). Collaborative technologies allow synchronous and asynchronous communication, sequential single-user editing and simultaneous editing of content during group work, as well as access to current and past information and information exchange logs (Recker et al., 2013). Thus, they facilitate communication and interaction with (project) team members and help employees better coordinate their work (Bélanger & Allport, 2008; Bertolotti et al., 2015; Doll & Deng, 2001). They can be used to share information, knowledge, insights, ideas, and experiences (Bélanger & Allport, 2008; Recker et al., 2013) and allow the efficient storage and retrieval of information and knowledge (Adamides & Karacapilidis, 2006; Bertolotti et al., 2015). In sum, collaborative technologies enhance the effectiveness of project-based group work (Shih et al., 2015) by reducing the cognitive costs of communication, coordination, and knowledge sharing (Recker et al., 2013).

The above described characteristics reduce the time and effort that need to be invested in collaboration and thus free up time, while also encouraging more collaboration which facilitates intrapreneurial activities. Moreover, collaborative technologies offer the opportunity to interact with colleagues from various backgrounds across functional boundaries, hierarchical levels, and locations (Bertolotti et al., 2015; Recker et al., 2013). Allowing both asynchronous and synchronous communication, collaboration, and knowledge sharing, they substitute traditional sources of information and feedback (Bertolotti et al., 2015) and contribute to generating innovative problem solutions (Recker et al., 2013). In line with this, Schneckenberg et al.'s (2015) findings indicate that collaborative technologies leverage learning and knowledge sharing, which are important for intrapreneurial endeavours.

Intelligent decision support systems are characterised by high specificity and low relationality (von Briel et al., 2018). They are used by decision-makers for '(a) organizing problem inputs; (b) structuring the decision problem decision model; (c) using the decision model to simulate policies and events; (d) finding the best problem solution' (Phillips-Wren et al., 2009, p. 643). They incorporate a data base with decision relevant data, a knowledge base with problem knowledge, and a model base with a formal decision model and solution method (algorithms) (Phillips-Wren et al., 2009). Thus, inputs, transformations, and outputs are tightly controlled and interactions are usually limited to one actor using the system at a time.

Due to their high specificity and low relationality, intelligent decision support systems should have a high potential for allowing to save time and resources (von Briel et al., 2018). Intelligent decision support systems extend human's cognition when facing complexity (Jarrahi, 2018), which in turn should enable employee intrapreneurial behaviour. These systems help to filter the increasing overflow of information in times of accelerating digitalisation and enable effective and productive decision-making (Baskerville et al., 2020; Jantan et al., 2010). Automatically identifying robust patterns from big data, algorithms in intelligent decision support systems allow predictions and recommend actions (Kellogg et al., 2020; Shrestha et al., 2019). Artificial-intelligence-based decision-making is comparatively fast, involves highly replicable processes and outcomes, and allows to evaluate a large set of alternatives (Shrestha et al., 2019). Thus, intelligent decision support systems should decrease the amount of time as well as the mental and cognitive effort that have to be invested when performing intrapreneurial activities. Moreover, intelligent decision support systems facilitate decision-making processes where uncertainty or incomplete information exist (Jantan et al., 2010). Intrapreneurial activities are characterised by uncertainty (McGrath, 1999; McGrath & MacMillan, 2000), which makes the risk of a failure inherently high (Shepherd et al., 2013). By providing real-time insights about early warning signs of problems, intelligent decision support systems help to detect anomalies and enable timely corrective actions (Jarrahi, 2018). In addition, they can bypass biases and heuristics (Kellogg et al., 2020) that employees may use in intrapreneurial decision-making (see Shepherd & Patzelt, 2017), decreasing the likelihood of failure and reducing risk.



To summarise, support by social media, support by collaborative technologies, and support by intelligent decision support systems reflect the availability of new opportunities and thus become salient, which is an important precondition for providing the impetus to act intrapreneurially (Greenberger & Sexton, 1988; Hornsby et al., 1993). Consequently, digital technology support should foster employee intrapreneurial behaviour. Thus, we propose:

**Hypothesis 1.** (a) *Support by social media, (b) support by collaborative technologies, and (c) support by intelligent decision support systems are positively related to employee intrapreneurial behaviour.*

### 3.2 | The moderating role of management support for innovation

Building on an interactionist perspective on corporate entrepreneurship (Hornsby et al., 1993), we propose that the impetus to engage in intrapreneurial behaviour provided by digital technology support is contingent on further organisational characteristics. Management support for innovation is an organisational characteristic that plays a role in fostering employee intrapreneurial activities (Hornsby et al., 2009). It is defined as ‘the willingness of top-level managers to facilitate and promote entrepreneurial behavior, including the championing of innovative ideas and providing the resources people require to take entrepreneurial actions’ (Kuratko et al., 2005, p. 703). It reflects ‘the extent to which the management structure itself encourages employees to believe that innovation is, in fact, part of the role set for all members of the organization’ (Hornsby et al., 1993, p. 32). It is characterised by a quick adoption of employee ideas, the recognition of people who bring ideas forward, support for small experimental projects, and seed money to get projects off the ground (Hornsby et al., 1993). As such, it is an established construct within intrapreneurship research that has been found to be relevant in fostering employee intrapreneurial behaviour (Kuratko et al., 1990, 2005).

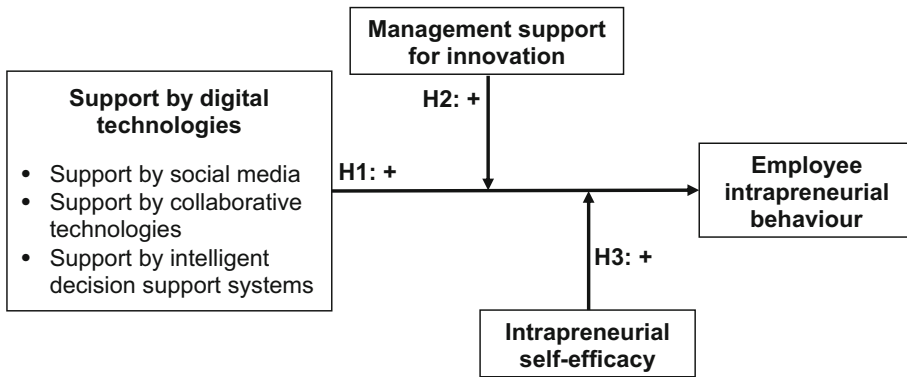
We propose that employees with management support for innovation at their disposal will be more likely to recognise the intrapreneurship-enabling potential provided by social media, collaborative technologies, and intelligent decision support systems. We do so for the following reasons. First, the encouraging effect of management support for innovation fosters employee creativity (Amabile et al., 1996; Madrid et al., 2014), which is seen as essential for successfully utilising digital technologies to generate novel ideas and solutions (Nambisan et al., 2017; Shao et al., 2022). Second, management support for innovation promotes employee beliefs that entrepreneurial behaviour is expected of all members of the organisation (de Villiers-Scheepers, 2012). This may cause employees to search for methods and tools that make it easier to fulfil this expectation and make them more prone to recognise the enabling potential provided by digital technologies. Third, management support for innovation creates the perception that explorative behaviour, creative problem solving, and proactive opportunity seeking are valued (de Villiers-Scheepers, 2012). The more employees perceive that the management supports seeking and recognising new business opportunities, the more they should feel inclined to reciprocate by seeking for new opportunities (Dimov, 2007; Zampetakis et al., 2009). Consequently, they should be more likely to recognise the intrapreneurship-enabling opportunities offered by digital technologies. Thus, we propose:

**Hypothesis 2.** *Management support for innovation moderates the relationships of (a) support by social media, (b) support by collaborative technologies, and (c) support by intelligent decision support systems with employee intrapreneurial behaviour such that the positive relationships are stronger (weaker) when management support for innovation is high (low).*

### 3.3 | The moderating role of intrapreneurial self-efficacy

In line with an interactionist perspective on corporate entrepreneurship (Hornsby et al., 1993), we further propose that the impetus to engage in intrapreneurial behaviour provided by digital technology support is not only contingent





**FIGURE 1** Conceptual model

on further organisational characteristics, but also on individual characteristics. Employees' intrapreneurial self-efficacy is an individual characteristic that is important regarding employee intrapreneurial behaviour (Globocnik & Salomo, 2015) because 'efficacy beliefs influence how people feel, think, motivate themselves, and behave' (Bandura, 1993, p. 118). Intrapreneurial self-efficacy is defined as the belief in one's ability to successfully perform the roles and tasks associated with intrapreneurship (Blanka, 2019; Globocnik & Salomo, 2015).

We propose that employees with high intrapreneurial self-efficacy will be more likely to recognise the intrapreneurship-enabling potential provided by social media, collaborative technologies, and intelligent decision support systems. We do so for the following reasons. First, employees with high intrapreneurial self-efficacy have a higher intrinsic motivation for intrapreneurial tasks and accept higher levels of risk (Globocnik & Salomo, 2015), which sparks their creativity (Dewett, 2007). Being creative entails finding new ways and searching out new technologies to achieve goals (Zhou & George, 2001). Consequently, employees with high intrapreneurial self-efficacy should be more likely to see how digital technologies can enable intrapreneurial endeavours. Second, highly self-efficacious employees have strong confidence in their abilities and a focus on opportunities (Krueger & Dickson, 1993). Employee self-efficacy has been found to be positively related to the perception of opportunities (Krueger & Dickson, 1994; Sardeshmukh & Corbett, 2011). Consequently, employees high in intrapreneurial self-efficacy should be more likely to recognise that the enabling mechanisms provided by digital technologies constitute opportunities for a facilitated enactment of intrapreneurial activities. Thus, we propose:

**Hypothesis 3.** *Intrapreneurial self-efficacy moderates the relationships of (a) support by social media, (b) support by collaborative technologies, and (c) support by intelligent decision support systems with employee intrapreneurial behaviour such that the positive relationships are stronger (weaker) when intrapreneurial self-efficacy is high (low).*

Our proposed conceptual model is shown in Figure 1.

## 4 | METHODS

### 4.1 | Sample

We used a metric conjoint experimental design to examine our research questions. Participants were recruited via the professional network service Xing that is the leading online business network in German-speaking countries with

19 million members (New Work SE, 2021). We contacted Xing users who matched our inclusion criteria, that is, worked in for-profit organisations in the manufacturing sector in Germany. We did not include assembly-line workers, part-time workers, or leased labourers because the structure of these jobs should provide only few opportunities to perform intrapreneurial behaviour. Being a part-time worker, for example, was found to be negatively related to the likelihood of becoming an intrapreneur (Adachi & Hisada, 2017). Therefore, we only recruited employees who had a realistic chance of being able to perform intrapreneurial behaviours. This was done to ensure that the situation presented to participants is familiar to them in order to avoid that results are biased by artificial responses (Aguinis & Bradley, 2014; Aiman-Smith et al., 2002; Cavanaugh & Fritzsche, 1985). Our study focused on the manufacturing sector for several reasons: With a share of Germany's gross value added of 20.2% in the year 2021 (German Federal Statistical Office, 2022), the manufacturing sector is a major contributor to Germany's economic performance (German Federal Ministry for Economic Affairs and Energy, 2019). Operating in a highly dynamic environment characterised by technological, societal, and economic challenges, firms in this sector have a high necessity for radical change and disruptive innovation (German Federal Ministry for Economic Affairs and Energy, 2019), making intrapreneurial activities that reflect 'departures from the customary ways of doing business' (Antoncic & Hisrich, 2003, p. 20) and therefore foster innovation (Halme et al., 2012) particularly relevant and salient. The manufacturing sector is not only Germany's economic sector with the highest innovation expenditures (German Federal Ministry of Education and Research, 2022). The Intrapreneurship Monitor 2021 (Baum et al., 2021) also showed that German companies from the manufacturing sector had the highest share of intrapreneurial activities. Potential study participants who accepted our contact request received an additional message including further information and the link to the study questionnaire.

We sent the link to the questionnaire to 363 employees. Of those, 106 provided complete answers, which reflects a response rate of 29.20%. Additionally, we checked for our inclusion criteria (see above) via corresponding questions included in the survey. In total, 95 participants provided complete answers and matched the inclusion criteria. After checking for test-retest reliability, we had to exclude 10 participants due to low test-retest reliability scores between the main scenarios and the duplicates (see below). This led to a final sample size of 85.

In our final sample, 20.00% were female, which approximately matches the proportion of women working full-time in the German manufacturing sector (German Federal Statistical Office, 2020). The average participant was 42.95 years old and had 19.25 years of working experience. Among participants, 81.18% had a leadership position in their respective organisation. Regarding hierarchy level, 8.24% held operational level positions, 31.76% lower management positions, 36.47% middle management positions, and 23.53% upper management positions.<sup>3</sup> This is in accordance with Hornsby et al. (2009), who stated that actors at different hierarchical levels—ranging from operational level employees to upper managers—are involved in intrapreneurial activities. Thus, our sample includes realistic targets for entrepreneurial engagement within organisations (Baum & Rabl, 2019; Monsen et al., 2010).

To test for non-response bias, we compared the individuals that did not react to our invitation with the participants in our final sample regarding their sex and their organisational tenure stated in their professional network service profile. This procedure allowed us to check whether there are differences between true non-respondents and true respondents. There were no statistically significant differences regarding sex ( $\chi^2 = 2.55, p = 0.11$ ) and organisational tenure ( $t[1631] = 0.03, p = 0.98$ ). Additionally, we compared early and late respondents regarding sex, organisational tenure, and company size. There were no statistically significant differences regarding sex ( $\chi^2 = 0.23, p = 0.63$ ), organisational tenure ( $t[32] = -0.15, p = 0.88$ ), and company size ( $\chi^2 = 1.03, p = 0.60$ ). These analyses suggest that non-response bias does not seem to be a major issue in our study.

## 4.2 | Design of the conjoint experiment

In metric conjoint experiments, participants evaluate a number of hypothetical scenarios (i.e., profiles) that are described by a combination of decision attributes (Brundin et al., 2008). After each scenario, participants have to

make decisions (e.g., decision to initiate an intrapreneurial project). Decomposing participant evaluations into the underlying structures (Louviere & Hout, 1988), conjoint experiments allow us to examine the specific determinants of employee intrapreneurial behaviour. Conjoint experiments are widely used in (corporate) entrepreneurship research (e.g., Baum & Rabl, 2019; Behrens & Patzelt, 2016; Monsen et al., 2010). Making assessments based on only a few limited cues is consistent with observations that real life decision-makers typically use between three and seven attributes when deciding (Brundin et al., 2008; Stewart, 1988). Moreover, evidence suggests that the decision policies actually used by decision-makers are significantly reflected by conjoint experiments, even in artificial situations (Brundin et al., 2008; Hammond & Adelman, 1976). Furthermore, by enabling the collection of real-time data on the decisions of individuals, the results obtained from conjoint analyses are less prone to introspective and self-report biases commonly found in interview and survey data (Fischhoff, 1988; Shepherd & Zacharakis, 1997). Drawing on an experimental design also secures a high level of internal validity (Aguinis & Bradley, 2014). Therefore, the conjoint approach should be particularly suited for our research purpose.

According to Carroll and Green (1995) and Green and Srinivasan (1978), conducting a conjoint experiment requires the choice of the data collection method, the construction of the stimulus set, the choice of how to present the stimuli to participants, the choice of the measurement scale for the dependent variable, and finally the choice of the estimation method.<sup>4</sup> When conducting a conjoint experiment, a researcher has to choose from several data collection approaches that differ in the number of profiles that have to be assessed and the way how respondents have to evaluate profiles (see Rao, 2014). As it allows us to give a more realistic description of the stimuli (Green & Srinivasan, 1978), we applied a full profile approach in which all decision attributes are used in every profile (Rao, 2014).

We constructed our stimulus set as follows: The decision situations in our conjoint experiment were described by four manipulated variables (the three independent variables support by social media, support by collaborative technologies, and support by intelligent decision support systems and the moderator variable management support for innovation) varying across two levels ('present' or 'not present' for the three independent variables and 'high' or 'low' for the moderator variable). We used a full profile approach (Rao, 2014) in order to be able to compute interactions among the manipulated variables (Hahn & Shapiro, 1966). This resulted in 16 combinations of attribute levels and therefore 16 decision profiles. Duplicating all of those 16 decision profiles would have entailed the risks of unreliable answers, participant fatigue, and participant dropout. Therefore, we decided to duplicate four randomly selected profiles to check for test-retest reliability. This is in accordance with Aiman-Smith et al.'s (2002) suggestion and consistent with several studies using conjoint experiments (e.g., Drover et al., 2014; Holland & Garrett, 2015; Murnieks et al., 2016). In addition to these 16 plus four profiles, a 'warm-up' profile and a bogus scenario were added. Consequently, each participant had to evaluate 22 decision profiles in total. However, following Aiman-Smith et al. (2002) and Cooksey (1996), we excluded the 'warm-up' profile, the bogus scenario, and the four replicated profiles from the statistical analyses. Therefore, our data set includes 1360 data points (i.e.,  $16 \times 85$  decisions resulting from 85 participants each rating 16 decision profiles). Furthermore, we randomised profile presentation and used two versions of the experiment differing in the order of the decision criteria to reduce the probability of order effects (Brundin et al., 2008).

Regarding the stimulus presentation, we followed other conjoint studies in the (corporate) entrepreneurship domain (e.g., Baum & Rabl, 2019; Behrens & Patzelt, 2016; Monsen et al., 2010) and used verbal descriptions with stimulus cards. The online survey started with a scenario description (see Appendix A) asking respondents to imagine that they identified a new and interesting business opportunity while chatting with colleagues. To reflect the innovative, proactive, and risky characteristics of intrapreneurial behaviour (Miller, 1983), we followed Monsen et al. (2010) and emphasised the innovative character of that business opportunity, told our participants that if they wanted to realise it, they would have to act quickly and promptly form a project team, and mentioned the potential negative career consequences. We accounted for the structural dimensions of a new corporate venture (Sharma & Chrisman, 1999) by stating that if successful, the project might result in a new strategic business unit or an independent spin-off. Moreover, participants were told to consider the project under the current economic conditions in

Germany. They were also asked to assume that all other parameters of the project and the environment were the same for all scenarios, that all project participants worked under the same four conditions (i.e., the manipulated variables), and that except for those, the type and scope of the hypothetical project would be comparable to current or previous projects in their organisation. We also told them to assume that the decision attributes cannot be changed in the medium term. Consequently, we stated that the variables manipulated in our conjoint experiment represent the conditions for a project that is undertaken to realise the mentioned business opportunity. The scenario introduction was followed by the presentation of the decision profiles (each including the dependent variable). Thus, while the project was always the same, the conditions changed with the different profiles. After having evaluated all decision profiles, respondents were asked to answer a post-experiment questionnaire that includes measures of the individual moderator variables and the control variables. By manipulating independent variables in our conjoint experiment, we ensured the salience of digital technology support because participants had to consciously process whether they would perform intrapreneurial behaviour when facing the respective decision profile.

Following other conjoint studies that examined employee decisions on whether to involve themselves in entrepreneurial activities within their organisations (e.g., Baum & Rabl, 2019; Monsen et al., 2010), we used an interval scale for assessing employee intrapreneurial behaviour (see Section 4.3). The choice of this measurement scale also had implications for the estimation method (Green & Srinivasan, 1978). When using interval scales, regression-related methods of analysis are mainly applied (Rao, 2014). As we hypothesised interactions between variables from different levels, we used multi-level regression analyses.

## 4.3 | Measures and manipulations

To measure our variables, we selected suitable and reliable measures from previously validated instruments. Scales for which no validated German scales existed went through a translation-back-translation procedure (Brislin, 1970) undertaken by bilingual experts.

### 4.3.1 | Dependent variable

Employee intrapreneurial behaviour was captured after each decision by using a self-developed item based on Monsen et al. (2010). Participants were asked (framed by the decision attributes) to evaluate their likelihood to start an intrapreneurial project on their own accord on a seven-point Likert-type scale ranging from 1, 'no, definitely not', to 7, 'yes, definitely'. It reads 'Based on the description of the intrapreneurial project above, how do you rate the likelihood that you would initiate and advance such a project in your firm on your own accord?'

### 4.3.2 | Variables manipulated in the conjoint experiment

Support by social media, support by collaborative technologies, support by intelligent decision support systems, and management support for innovation were manipulated in our conjoint experiment. In the digital technology support manipulations, participants were provided with examples of the respective digital technology to increase comprehensibility (see examples in parentheses). Support by social media (e.g., social networks, blogs, content communities) captured whether employees have the possibility (in the 'present' condition) or do not have the possibility (in the 'not present' condition) to use social media within the project. Support by collaborative technologies (e.g., instant messaging services, project management systems, work and task management systems) captured whether employees can draw on collaborative technologies for collaborating in the project (in the 'present' condition) or not (in the 'not present' condition). Support by intelligent decision support systems (e.g., intelligent predictive systems, text mining,

machine learning) captured whether employees can consult intelligent decision support systems for the project work (in the 'present' condition) or not (in the 'not present' condition). Appendix B shows the full specifications. A sample card can be seen in Appendix C.

To ensure the practical relevance and external validity of our manipulations of digital technology support, we conducted a supplementary study with 109 respondents who fulfilled the same inclusion criteria as in our main study. We asked participants to rate how frequently social media, collaborative technologies, and intelligent decision support systems are used in their organisations on a five-point Likert-type scale ranging from 1, 'never', to 5, 'always'. Regarding social media, 60.55%, 28.44%, and 11.01% of the participants indicated that they are never or rarely, occasionally, or often or always used in their organisations ( $\bar{x} = 2.28$ ,  $SD = 1.05$ ). A total of 31.19%, 25.69%, and 43.12% of the participants, respectively, stated that collaborative technologies are never or rarely, occasionally, or often or always used in their organisations ( $\bar{x} = 3.17$ ,  $SD = 1.28$ ). For intelligent decision support systems, 88.99%, 8.26%, and 2.75% of the participants, respectively, specified that these are never or rarely, occasionally, or often or always used in their organisations ( $\bar{x} = 1.43$ ,  $SD = 0.76$ ). Thus, although intelligent decision support systems do not seem to be widely-used yet, results from our supplementary study show that the full range of support by social media, collaborative technologies, and intelligent decision support systems is present in organisations. They underline that it is a legitimate assumption that there are situations in which employees do not have support by social media, collaborative technologies, and intelligent decision support systems. This indicates that our experimental conditions are practically relevant and externally valid.

The manipulation of management support for innovation was based on the definition of Kuratko et al. (2005). In the 'high' condition, management facilitates and promotes employee innovative behaviour to a large degree by strongly championing innovative ideas and providing the resources people require to take innovative actions. In the 'low' condition, management facilitates and promotes employee innovative behaviour to a minor degree by weakly championing innovative ideas and hardly providing the resources people require to take innovative actions.

### 4.3.3 | Variables from the post-experiment survey

The moderator intrapreneurial self-efficacy was measured with a 10-item scale from Globocnik and Salomo (2015). A sample item is 'I have confidence in generating new ideas'. The items had to be rated on a five-point Likert-type scale ranging from 1, 'does not apply at all', to 5, 'fully applies'. Additionally, we controlled for prior entrepreneurial experience, personal initiative, and willingness to take risk. These variables reside on the individual level and are treated accordingly in our analysis. We controlled for employee willingness to take risk because risk taking has been found to be positively related to employee intrapreneurial behaviour (Gawke et al., 2019). We assessed it using a single item from Beierlein et al. (2014). As prior entrepreneurial experience was found to be the most important human capital variable determining entrepreneurial intentions (Fitzsimmons & Douglas, 2011), we included it as a control variable, measured via the sum score out of four binary items (coded 0 = no, 1 = yes) developed by Peterman and Kennedy (2003). A sample item is 'Have you ever started a business?' Personal initiative, an individuals' tendency to engage in work behaviours characterised by a self-starting nature, a proactive approach, and by being persistent in overcoming difficulties that arise in the pursuit of a goal (Frese et al., 1996, 1997) was also added as a control variable. Personal initiative implies the use of productive, creative, and active strategies and overcoming problems in case they occur and has been proposed to be related to (corporate) entrepreneurship (Frese et al., 1996, 1997). Items from the seven-item scale by Frese et al. (1997) were measured on a five-point Likert-type scale ranging from 'does not apply at all' to 'fully applies'. A sample item is 'I actively attack problems'. Moreover, we also included age as a continuous control variable measured in years because younger individuals tend to be more adventurous and hence may have a greater willingness to engage in intrapreneurial activities (Lee & Wong, 2004). Finally, as women and men were found to differ in their rate of entrepreneurial entry (Autio et al., 2013), we controlled for sex (coded 0 = men, 1 = women).

To validate the latent variables intrapreneurial self-efficacy and personal initiative, we evaluated the scales' reliability and validity (e.g., MacKenzie et al., 2011). First, we computed Cronbach's alpha to assess the reliability which was 0.86 for intrapreneurial self-efficacy and 0.79 for personal initiative. Then, we performed a confirmatory factor analysis and tested for the convergent and discriminant validity of our scales. In this process, we also tested whether eliminating items with low factor loadings would improve validity. Due to the reflective nature of our scales, excluding items does not change the measure (Fischer et al., 2010; Jarvis et al., 2003). After purifying our scales all constructs fulfilled the common criteria for convergent and discriminant validity (see Fornell & Larcker, 1981). Scale purification did not threaten the scales' reliabilities. Cronbach's alpha values after scale purification were 0.82 for intrapreneurial self-efficacy and 0.76 for personal initiative. Appendix D shows the items and information on the scales' validity and reliability.

## 5 | RESULTS

Table 2 displays the descriptive statistics of the Level 2 variables. Mean test-retest reliability was 0.76 for employee intrapreneurial behaviour and thus at an acceptable level (see e.g., Shepherd, 1999; Shepherd et al., 2003).

Using 16 decisions per participant yielded 1360 observations within 85 individuals. Thus, our sample size is in line with previously published conjoint studies (e.g., Drover et al., 2014; Shepherd et al., 2003). Due to the nested structure of our data, we applied multi-level regression analyses using SPSS 26. Level 1 refers to variables manipulated in the decision profiles and Level 2 refers to the individual level variables. Following Glaser et al. (2016), we first ran a null-model without any predictor to ensure that there is sufficient variance between individuals. The  $ICC_1$  value was 0.16, which indicates that the variability between units was large and multi-level modelling was appropriate. Table 3 displays the results from our multi-level regression analyses. We entered interactions in a step-wise manner into the model, which is a common method in multi-level studies testing multiple interactions (e.g., Hauswald et al., 2016), to have less confounded effects. Moreover, even though it is difficult to estimate precise effect sizes in cross-level models, we report Snijders and Bosker's (1999) pseudo  $R^2$ .

In Model 1, only control variables (all Level 2) were entered. Results indicated that employees were more likely to engage in intrapreneurial behaviour when they were male ( $b = -0.73, p < 0.01$ ), showed a higher willingness to take risk ( $b = 0.26, p = 0.04$ ), and demonstrate higher personal initiative ( $b = 0.56, p < 0.01$ ).

In Model 2, we entered the independent variables manipulated in the conjoint profiles. The relationships between support by social media ( $b = 0.41, p < 0.01$ ), support by collaborative technologies ( $b = 0.96, p < 0.01$ ), and support by intelligent decision support systems ( $b = 0.63, p < 0.01$ ) with employee intrapreneurial behaviour were statistically significant and positive. Thus, Hypothesis 1a-c received support. In Model 3, management support for innovation was entered. Management support for innovation was statistically significantly and positively related to

**TABLE 2** Descriptive statistics of Level 2 variables: Means, standard deviations, and correlations

Variables	Mean	SD	1	2	3	4	5
1. Age	42.95	8.91					
2. Sex	0.20	0.40	-0.09				
3. Willingness to take risks	3.35	0.65	-0.22*	-0.09			
4. Entrepreneurial experience	1.74	0.98	-0.03	-0.02	0.13		
5. Personal initiative	3.90	0.58	-0.08	0.01	0.17	0.03	
6. Intrapreneurial self-efficacy	3.89	0.64	0.04	0.05	0.19	0.19	0.61**

Note:  $N = 85$ . Sex is coded 0 = male and 1 = female.

\* $p < 0.05$ ; \*\* $p < 0.01$ .

**TABLE 3** Multi-level analysis results for employee intrapreneurial behaviour

Dependent variable: Employee intrapreneurial behaviour	Model 1		Model 2		Model 3		Model 4		Model 5		Model 6	
	b	SE	b	SE	b	SE	b	SE	b	SE	b	SE
Intercept	3.85***	0.09	2.86***	0.11	1.67***	0.12	1.68***	0.12	1.88***	0.12	1.88***	0.12
Age	-0.01	0.01	-0.01	0.01	-0.01	0.01	-0.01	0.01	-0.01	0.01	-0.01	0.01
Sex	-0.73***	0.19	-0.81**	0.22	-0.82***	0.19	-0.87***	0.18	-0.87***	0.18	-0.87***	0.18
Willingness to take risks	0.26*	0.12	0.16	0.14	0.22†	0.12	0.21†	0.12	0.21†	0.12	0.21†	0.12
Entrepreneurial experience	-0.05	0.08	-0.07	0.09	-0.04	0.08	-0.07	0.08	-0.07	0.08	-0.07	0.08
Personal initiative	0.56***	0.13	0.48**	0.16	0.56***	0.13	0.33*	0.16	0.33*	0.16	0.33*	0.16
H1a Support by social media (SSM)			0.41***	0.09	0.41***	0.07	0.41***	0.07	0.36***	0.08	0.36***	0.07
H1b Support by collaborative technologies (SCT)			0.96***	0.09	0.96***	0.07	0.96***	0.07	0.73***	0.08	0.73***	0.08
H1c Support by intelligent decision support systems (IDS)			0.63***	0.09	0.63***	0.06	0.63***	0.06	0.53***	0.07	0.53***	0.07
Management support for innovation (MSI)					2.38***	0.12	2.38***	0.12	2.00***	0.14	2.00***	0.14
Intrapreneurial self-efficacy (ISE)							0.35*	0.15	0.35*	0.15	0.01	0.18
H2a SSM × MSI									0.10	0.08	0.10	0.08
H2b SCT × MSI									0.47***	0.08	0.47***	0.08
H2c IDS × MSI									0.19*	0.08	0.19*	0.08
H3a SSM × ISE											0.32**	0.10
H3b SCT × ISE											0.24*	0.11
H3c IDS × ISE											0.04	0.09
Level 1 Pseudo R <sup>2</sup>	0.07		0.17		0.59		0.59		0.60		0.60	
Level 2 Pseudo R <sup>2</sup>	0.32		0.32		0.32		0.34		0.34		0.34	

Note: N = 1360 decisions nested within 85 individuals. Unstandardised coefficients are reported. Sex is coded 0 = male and 1 = female.

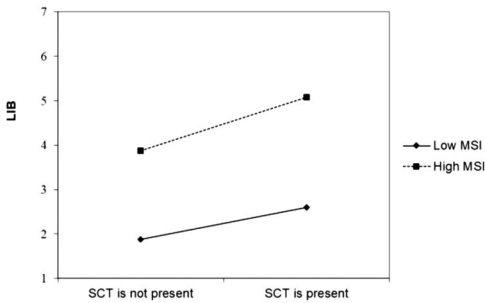
†p < 0.10; \*p < 0.05; \*\*p < 0.01; \*\*\*p < 0.001.



employee intrapreneurial behaviour ( $b = 2.38, p < 0.01$ ). In Model 4, we entered intrapreneurial self-efficacy, which was statistically significantly and positively related to employee intrapreneurial behaviour ( $b = 0.35, p = 0.02$ ). In Model 5, the interaction effects between the digital technology support variables and management support for innovation proposed in Hypothesis 2 were added. We found a statistically significant and positive interaction of management support for innovation with support by collaborative technologies ( $b = 0.47, p < 0.01$ ) and with support by intelligent decision support systems ( $b = 0.19, p = 0.01$ ). The interaction of management support for innovation with support by social media ( $b = 0.10, p = 0.18$ ) was not statistically significant. This provided support for Hypothesis 2b and c, while Hypothesis 2a did not receive support. We plotted all significant two-way interaction effects in order to facilitate interpretation (see Figure 2).

We entered the interaction effects between the digital technology support variables and intrapreneurial self-efficacy in Model 6. Results showed statistically significant and positive interactions of support by social media ( $b = 0.32, p < 0.01$ ) and support by collaborative technologies ( $b = 0.24, p = 0.04$ ) with intrapreneurial self-efficacy on employee intrapreneurial behaviour (see Figure 2). The interaction between support by intelligent decision

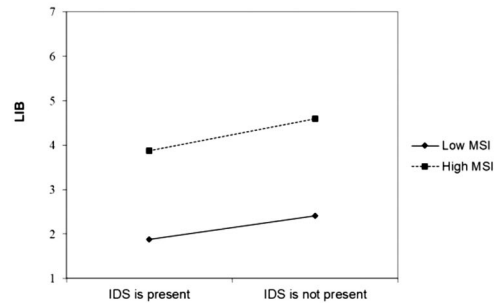
Two-way interaction of support by collaborative technologies (SCT) and management support for innovation (MSI) on employee intrapreneurial behaviour (LIB)



**Simple slope analysis:**

Low MSI: simple slope = 0.73,  $t = 8.69, p < 0.01$   
High MSI: simple slope = 1.20,  $t = 14.35, p < 0.01$

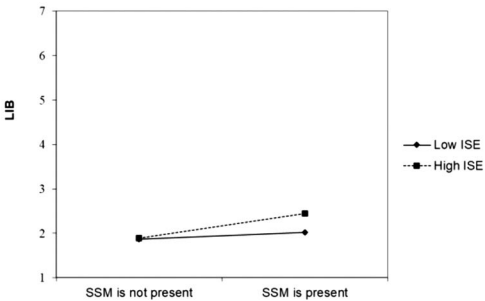
Two-way interaction of support by intelligent decision support systems (IDS) and management support for innovation (MSI) on employee intrapreneurial behaviour (LIB)



**Simple slope analysis:**

Low MSI: simple slope = 0.53,  $t = 7.83, p < 0.01$   
High MSI: simple slope = 0.72,  $t = 10.64, p < 0.01$

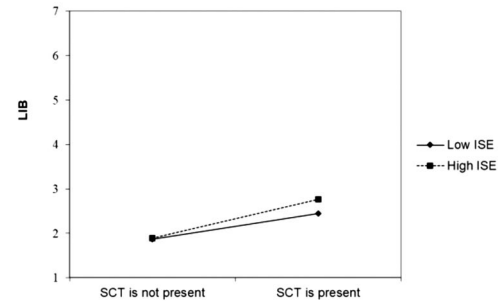
Two-way interaction of support by social media (SSM) and intrapreneurial self-efficacy (ISE) on employee likelihood of intrapreneurial behaviour (LIB)



**Simple slope analysis:**

Low ISE: simple slope = 0.16,  $t = 1.63, p = 0.10$   
High ISE: simple slope = 0.57,  $t = 5.83, p < 0.01$

Two-way interaction of support by collaborative technologies (SCT) and intrapreneurial self-efficacy (ISE) on employee likelihood of intrapreneurial behaviour (LIB)



**Simple slope analysis:**

Low ISE: simple slope = 0.58,  $t = 5.22, p < 0.01$   
High ISE: simple slope = 0.88,  $t = 7.97, p < 0.01$

**FIGURE 2** Two-way interaction effects on employee intrapreneurial behaviour

support systems and intrapreneurial self-efficacy was not statistically significant ( $b = 0.04$ ,  $p = 0.67$ ). This provided support for Hypothesis 3a and b. Hypothesis 3c was not supported.<sup>5</sup>

As we found personal initiative and intrapreneurial self-efficacy to be statistically significantly correlated ( $r = 0.61$ ), we also tested models excluding the control variable personal initiative as a robustness check to make sure that our results are not biased due to multicollinearity issues. Our results did not change. Moreover, as a second robustness check to ensure that our scale purification did not affect our findings, we also tested models using the full set of items of personal initiative and intrapreneurial self-efficacy. Again, results did not change, supporting the robustness of our findings.

## 6 | DISCUSSION

### 6.1 | Theoretical implications

Drawing on theorising on digital technologies as external enablers of entrepreneurial activities and an interactionist perspective on corporate entrepreneurship (Hornsby et al., 1993), our study examined the relationship between digital technology support and employee intrapreneurial behaviour and how it is moderated by organisational (i.e., management support for innovation) as well as individual (i.e., intrapreneurial self-efficacy) characteristics. As predicted, support by digital technologies (i.e., support by social media, support by collaborative technologies, and support by intelligent decision support systems) showed a significant positive effect on employee intrapreneurial behaviour. This result suggests that digital technology support makes it easier for employees to perform extra-role behaviours such as intrapreneurial behaviour that requires employees to 'go the extra mile' (Birkinshaw, 1997; Gawke et al., 2018; Neessen et al., 2019; Rigtering & Weitzel, 2013). By analysing digital technology support as an external enabler (see von Briel et al., 2018) of employee intrapreneurial behaviour, we add empirical evidence to Davidsson et al.'s (2020) theorising on the role of enablers. Furthermore, our findings indicate that digital technology support is another important factor of the internal organisational environment that enhances employee intrapreneurial behaviour. They therefore contribute to answering the recent call (e.g., by Rigtering et al., 2019) to shed more light on internal organisational environment antecedents of employee intrapreneurial behaviour.

Moreover, our results revealed that support by collaborative technologies had the strongest effect on employee intrapreneurial behaviour. This might be due to its strong interlinkage with project-related tasks and team processes, which are tied more closely to employees' daily work and thus have a stronger effect on their behaviour. In addition, support by intelligent decision support systems had a stronger effect on employee intrapreneurial behaviour than support by social media. Intelligent decision support systems are characterised by a high degree of specificity and a low degree of relationality, while social media are characterised by a low degree of specificity and a high degree of relationality. Specificity thus appears to be more important than relationality regarding the enabling role of digital technologies for employee intrapreneurial behaviour. Potential intrapreneurs seem to deem support that specifically reduces the risk and uncertainty that comes along with intrapreneurial actions more important than support that is able to leverage a large set of relationships. This might be due to the potential of high relationality (as present in social media) to create overload perceptions (e.g., W. Chen & Lee, 2013; Subramanian, 2017), which might lower employees' willingness to perform demanding endeavours such as intrapreneurial actions (Gawke et al., 2018).

Our study also contributes to the current discourse on how the organisational environment shapes intrapreneurship by showing that management support for innovation is an important boundary condition for the effect of digital technology support. As we found both direct and moderating effects of management support for innovation, we move beyond previous studies that only suggested a direct positive effect (e.g., Hornsby et al., 2002). Specifically, we found that management support for innovation strengthened the positive relationships between support by collaborative technologies and support by intelligent decision support systems with employee intrapreneurial behaviour.

With regard to individual characteristics, we found that the positive relationship between support by social media and support by collaborative technologies on the one hand and employee intrapreneurial behaviour on the other hand was stronger in cases of high rather than low employee intrapreneurial self-efficacy. These findings, together with the role of management support for innovation, are in line with Hornsby et al.'s (1993) interactionist perspective. With this, we contribute to the intrapreneurship literature by providing insights into the so far neglected interaction effects of individual and organisational determinants on employee intrapreneurial behaviour (see Neessen et al., 2019).

However, management support for innovation did not have a moderating effect on the relationship between support by social media and employee intrapreneurial behaviour. This could be because of the generativity that social media provide (Malsbender et al., 2014). By making communication, problems, and ideas visible and commentable and thus enabling help by a large undirected community (Leonardi, 2014; Malsbender et al., 2014), social media democratise support. This in turn might cause management support for innovation to lose its importance with regard to changing the effect of digital technology support on employee intrapreneurial behaviour.

Furthermore, we did not find intrapreneurial self-efficacy to moderate the relationship between support by intelligent decision support systems and employee intrapreneurial behaviour. Employees with high intrapreneurial self-efficacy are people that have high confidence in their capabilities to take the initiative to realise new products or services, to call top management's attention to new opportunities, and to convince top management and colleagues of the feasibility of a venture (Globocnik & Salomo, 2015). Social media and collaborative technologies are tools that facilitate communication (Treem & Leonardi, 2013) and thus make it easier to reach others to convince them of one's ideas. However, intelligent decision support systems do not provide such functions. Hence, employees with a high intrapreneurial self-efficacy might not be particularly attentive to the opportunities that support by intelligent decision support systems provides for easier performing intrapreneurial activities. This explains why we did not find an interaction effect of support by intelligent decision support systems and intrapreneurial self-efficacy on employee intrapreneurial behaviour.

In sum, our findings contribute to the digital entrepreneurship and information systems literatures by providing empirical evidence that digital technologies might not only be drivers of entrepreneurship, but also of intrapreneurial activities. In particular, we advance these literature streams by switching the perspective from the organisational level to the individual level, which has been largely neglected so far. By analysing the effect of digital technology support on employee intrapreneurial behaviour, we add further evidence to pioneer empirical studies (e.g., Arvidsson & Mønsted, 2018; Baum & Rabl, 2019; Petzsche et al., 2022) that investigated the role of digital technologies for individual-level entrepreneurship in existing organisations. However, by examining the effect of digital technology support on employee intrapreneurial behaviour and its contingencies, we move beyond these pioneer studies. With our study, we also respond to the call of Steinger (2019) for more research on digital technology facilitated entrepreneurship conducted on the individual level. By using a metric conjoint experimental design, we also seized Steinger's (2019) suggestion for choice experiments as the research instrument.

## 6.2 | Managerial implications

Our findings show that investing into their digital technology infrastructure can help organisations foster employee intrapreneurial behaviour. By providing social media, collaborative technologies, and intelligent decision support systems organisations can create an environment that supports and facilitates intrapreneurial activities.

Moreover, our results indicate that management support for innovation is an important determinant of employee intrapreneurial behaviour and also an important supporting factor for fostering the initiation of intrapreneurial activities. Therefore, managers should show that they are aware of innovative employee ideas and encourage and reward the submission of ideas. They should also provide the necessary expertise as well as resources

(e.g., money and time to get new project ideas off the ground) to perform intrapreneurial activities and institutionalise the intrapreneurial activity within the firm's system and processes (Hornsby et al., 2002; Kuratko et al., 2005).

In addition, our findings show that intrapreneurial self-efficacy is an important factor for leveraging the potential of digital technology support, in particular when organisations aim to encourage employees to initiate intrapreneurial activities. Thus, organisations should support the development of employee beliefs in their capabilities to perform intrapreneurial tasks. Specific intrapreneurship trainings using action learning approaches might be an approach to do so (Byrne et al., 2016). Additionally, when recruiting new employees, organisations are well advised to pay specific attention to an applicant's self-efficacy and abilities with regard to performing intrapreneurship-related activities.

### 6.3 | Limitations and implications for future research

Our study has some limitations that provide avenues for future research. The big advantages of our conjoint experiment regarding minimising endogeneity issues (Anderson et al., 2020) and drawing causal conclusions come at a price: Participants had to make their decision based on artificially manipulated attributes in an experimental (i.e., non-natural) setting. An experiment cannot fully cover all idiosyncrasies and potential complexities that might be found in the field. In order to tackle this limitation, we followed recent suggestions (Grégoire et al., 2019) and undertook a multitude of measures that help us secure that our conjoint scenario and manipulations were realistic. For instance, we conducted a supplementary study to ensure the practical relevance and external validity of our manipulations, asked participants to consider the project under the current economic conditions, and told them that except for the four manipulated conditions the type and scope of the project would be comparable to current or previous projects in their organisation. These countermeasures, the results of our supplementary study, and recent publications on the value of conjoint studies in entrepreneurship (Hsu et al., 2017) make us confident that our results are internally but also externally valid. However, future studies should still examine if our results remain stable in various field settings. Such studies could further contribute to our findings by delving more deeply into individuals' decision-making processes when it comes to making use of digital technology support for intrapreneurial projects and by providing a finer-grained view on the effect of different degrees of digital technology support.

Moreover, we manipulated the moderator and organisational characteristic management support for innovation within the conjoint profiles, since experimentally manipulating variables allows us to make stronger causal claims (Antonakis et al., 2010; Lonati et al., 2018) and is less prone to socially desirable responses (Lonati et al., 2018). However, an alternative way of measuring management support for innovation would have been to include it in the post-experiment survey or through scenario grouping, which should be considered in future research. It might also be an interesting avenue for future research to consider digital technology related individual characteristics such as digital technology self-efficacy (Compeau & Higgins, 1995) or digital technology anxiety (Venkatesh, 2000) as potential moderators.

Similar to other conjoint studies examining employee intrapreneurial behaviour (e.g., Monsen et al., 2010), our study analysed reactions based on a scenario typical of one specific type of an intrapreneurship project—an innovative project that might lead to a new strategic business unit or an independent spin-off. However, intrapreneurial activities may not only take the form of venturing behaviour but also the form of strategic renewal behaviour (i.e., behaviour that aims at enhancing an organisation's ability to react to internal and external advancements; Gawke et al., 2017). Therefore, it would be interesting for future research to explore how digital technology support affects employee strategic renewal behaviour.

In our study, we focus on support by social media, support by collaborative technologies, and support by intelligent decision support systems as digital technology enablers of intrapreneurial behaviour, covering an ecological valid theoretical spectrum of the specificity and relationality dimensions and exemplifying the most relevant manifestations of these dimensions. As this selection does not cover all possible combinations of these dimensions, future

studies can build on our work by examining the enabling role of support by digital technologies that capture additional combinations. Moreover, to further support our findings, future research could also explore the effect on intrapreneurial behaviour of other relevant types of digital technology support that capture combinations of the specificity and relationality dimensions already covered in this study, such as 3D printing (high specificity and low relationality; von Briel et al., 2018).

Research has shown that cultural differences affect an individual's appraisal of the consequences of entrepreneurial activities (Gawke et al., 2018; Hayton et al., 2002; Turró et al., 2014) and that the institutional and socio-cultural context is relevant when considering the potential of digital technologies for entrepreneurial endeavours (Abubakre & Mkansi, 2022; Parthiban et al., 2020, 2021). As such, future research might compare samples from different cultural and institutional contexts (e.g., from different countries and industries).

Finally, in our study, we only investigated positive effects of using digital technologies on employee intrapreneurship. However, research suggests that digital entrepreneurship might also come along with downsides or costs for the entrepreneurs (Nambisan & Baron, 2021). Thus, future studies could address this and examine potential negative effects of using digital technologies for employees' intrapreneurship.

## ACKNOWLEDGMENT

Open Access funding enabled and organized by Projekt DEAL.

## CONFLICT OF INTEREST

The authors have no conflicts of interest to declare.

## DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available from the second author, Valentin Petzsche, upon reasonable request.

## ORCID

Tanja Rabl  <https://orcid.org/0000-0002-2712-7832>

Valentin Petzsche  <https://orcid.org/0000-0001-9580-1051>

Matthias Baum  <https://orcid.org/0000-0001-6659-2481>

Sonja Franzke  <https://orcid.org/0000-0002-4523-6629>

## ENDNOTES

- <sup>1</sup> In the literature, different conceptualizations of entrepreneurship within an existing organisation exist, among those corporate entrepreneurship and intrapreneurship (Blanka, 2019). While both concepts have been used interchangeably, they are distinct but 'symbiotic' (Gerards et al., 2021, p. 2079). Corporate entrepreneurship can be seen as a top-down process planned, promoted and monitored by the organisation. Intrapreneurship, on the other hand, can be described as a bottom-up process initiated by employees (Blanka, 2019; Gerards et al., 2021; Neessen et al., 2019; Rigtering & Weitzel, 2013).
- <sup>2</sup> We do so for two reasons: First, as initial research on their role regarding innovative and entrepreneurial endeavours indicates, social media (e.g., Martín-Rojas et al., 2020; Olanrewaju et al., 2020; Secundo et al., 2020), collaborative technologies (e.g., Schneckenberg et al., 2015) and intelligent decision support systems (e.g., Dellermann et al., 2019) are likely to also play an important role regarding employee intrapreneurial behaviour. Second, social media, collaborative technologies, and intelligent decision support systems represent digital technologies that differ from each other in two characteristics that are related to entrepreneurial endeavours, namely specificity and relationality, and therefore are likely to trigger different sets of mechanisms that enable employee intrapreneurial behaviour (see von Briel et al., 2018).
- <sup>3</sup> Holding a management position does not necessarily go along with having a leadership function (Yukl, 2013).
- <sup>4</sup> Green and Srinivasan (1978) also mention the choice of a model of preference as an initial step when conducting a conjoint experiment. However, as our conjoint experiment did not aim at disentangling consumer preferences, we skipped that step.

<sup>5</sup> Beyond these analyses and in line with an interactionist perspective on corporate entrepreneurship (Hornsby et al., 1993), we proposed and tested an additional Hypothesis 4: *The positive moderating effect of management support for innovation on the relationship between (a) support by social media, (b) support by collaborative technologies, and (c) support by intelligent decision support systems on the one hand and employee intrapreneurial behaviour on the other hand is stronger when intrapreneurial self-efficacy is low (three-way interaction)*. We found no significant three-way interactions. As our sample size did not allow for a robust test of these three-way interactions, we followed the request by the editorial team and removed this hypothesis and the corresponding analyses from the paper. Future studies should aim for sufficiently larger samples to test these three-way interactions.

## REFERENCES

- Abubakre, M., Faik, I., & Mkansi, M. (2021). Digital entrepreneurship and indigenous value systems: An Ubuntu perspective. *Information Systems Journal*, 31(6), 838–862. <https://doi.org/10.1111/isj.12343>
- Abubakre, M., & Mkansi, M. (2022). How do technologists do “ICT” for development? A contextualised perspective on ICT4D in South Africa. *European Journal of Information Systems*, 31(1), 7–24. <https://doi.org/10.1080/0960085X.2021.1978343>
- Adachi, T., & Hisada, T. (2017). Gender differences in entrepreneurship and intrapreneurship: An empirical analysis. *Small Business Economics*, 48(3), 447–486. <https://doi.org/10.1007/s11187-016-9793-y>
- Adamides, E. D., & Karacapilidis, N. (2006). Information technology support for the knowledge and social processes of innovation management. *Technovation*, 26(1), 50–59. <https://doi.org/10.1016/j.technovation.2004.07.019>
- Adomavicius, G., Bockstedt, J. C., Gupta, A., & Kauffman, R. J. (2008). Making sense of technology trends in the information technology landscape: A design science approach. *MIS Quarterly*, 32(4), 779–809. <https://doi.org/10.2307/25148872>
- Aguinis, H., & Bradley, K. J. (2014). Best practice recommendations for designing and implementing experimental vignette methodology studies. *Organizational Research Methods*, 17(4), 351–371. <https://doi.org/10.1177/1094428114547952>
- Aiman-Smith, L., Scullen, S. E., & Barr, S. H. (2002). Conducting studies of decision making in organizational contexts: A tutorial for policy-capturing and other regression-based techniques. *Organizational Research Methods*, 5(4), 388–414. <https://doi.org/10.1177/109442802237117>
- Amabile, T. M., Conti, R., Coon, H., Lazenby, J., & Herron, M. (1996). Assessing the work environment for creativity. *Academy of Management Journal*, 39(5), 1154–1184. <https://doi.org/10.5465/256995>
- Anderson, B. S., Schueler, J., Baum, M., Wales, W. J., & Gupta, V. K. (2020). The chicken or the egg? Causal inference in entrepreneurial orientation–performance research. *Entrepreneurship Theory and Practice*, 46(6), 1569–1596. <https://doi.org/10.1177/1042258720976368>
- Antonakis, J., Bendahan, S., Jacquart, P., & Lalive, R. (2010). On making causal claims: A review and recommendations. *The Leadership Quarterly*, 21(6), 1086–1120. <https://doi.org/10.1016/j.leafqua.2010.10.010>
- Antoncic, B., & Hisrich, R. D. (2001). Intrapreneurship: Construct refinement and cross-cultural validation. *Journal of Business Venturing*, 16(5), 495–527. [https://doi.org/10.1016/S0883-9026\(99\)00054-3](https://doi.org/10.1016/S0883-9026(99)00054-3)
- Antoncic, B., & Hisrich, R. D. (2003). Clarifying the intrapreneurship concept. *Journal of Small Business and Enterprise Development*, 10(1), 7–24. <https://doi.org/10.1108/14626000310461187>
- Arvidsson, V., & Mønsted, T. (2018). Generating innovation potential: How digital entrepreneurs conceal, sequence, anchor, and propagate new technology. *The Journal of Strategic Information Systems*, 27(4), 369–383. <https://doi.org/10.1016/j.jsis.2018.10.001>
- Autio, E., Nambisan, S., Thomas, L. D. W., & Wright, M. (2018). Digital affordances, spatial affordances, and the genesis of entrepreneurial ecosystems. *Strategic Entrepreneurship Journal*, 12(1), 72–95. <https://doi.org/10.1002/sej.1266>
- Autio, E., Pathak, S., & Wennberg, K. (2013). Consequences of cultural practices for entrepreneurial behaviors. *Journal of International Business Studies*, 44(4), 334–362. <https://doi.org/10.2139/ssrn.2229397>
- Bandura, A. (1993). Perceived self-efficacy in cognitive development and functioning. *Educational Psychologist*, 28(2), 117–148. [https://doi.org/10.1207/s15326985Sep2802\\_3](https://doi.org/10.1207/s15326985Sep2802_3)
- Barnett, W. A., Hu, M., & Wang, X. (2019). Does the utilization of information communication technology promote entrepreneurship: Evidence from rural China. *Technological Forecasting and Social Change*, 141, 12–21. <https://doi.org/10.1016/j.techfore.2019.01.007>
- Baskerville, R. L., Myers, M. D., & Yoo, Y. (2020). Digital first: The ontological reversal and new challenges for information systems research. *MIS Quarterly*, 44(2), 509–523. <https://doi.org/10.25300/MISQ/2020/14418>
- Batool, H., & Ullah, K. (2018). Pakistani women entrepreneurs and ICT intervention. *Journal of Entrepreneurship Education*, 21(1), 1–15.
- Baum, M., Isidor, R., Franzke, S., Schöler, J., & Strich, F. (2021). *Intrapreneurship monitor 2021* [Intrapreneurship monitor 2021]. Institute for Entrepreneurship & Innovation, University of Bayreuth. <https://www.eship.uni-bayreuth.de/de/forschung/Intrapreneurship-Monitor/Intrapreneurship-Monitor-2021.pdf>



- Baum, M., & Rabl, T. (2019). Digital capital as an opportunity-enhancer for employee corporate entrepreneurship decisions. In H. Krcmar, J. Fedorowicz, W. F. Boh, J. M. Leimeister, & S. Wattal (Eds.), *Proceedings of the 40th International Conference on Information Systems* (pp. 1–17). Association for Information Systems. [https://aisel.aisnet.org/ics2019/innov\\_entre/innov\\_entre/1](https://aisel.aisnet.org/ics2019/innov_entre/innov_entre/1)
- Behrens, J., & Patzelt, H. (2016). Corporate entrepreneurship managers' project terminations: Integrating portfolio-level, individual-level, and firm-level effects. *Entrepreneurship Theory and Practice*, 40(4), 815–842. <https://doi.org/10.1111/etap.12147>
- Beierlein, C., Kovaleva, A., Kemper, C. J., & Rammstedt, B. (2014). *Eine Single-Item-Skala zur Erfassung von Risikobereitschaft: Die Kurzskala Risikobereitschaft-1 (R-1)* [A single item scale to capture risk taking: The risk taking-1 (R-1) short scale] (GESIS Working Papers 2014/34). GESIS Leibniz-Institut für Sozialwissenschaften. [https://www.ssoar.info/ssoar/bitstream/handle/document/42670/ssoar-2014-beierlein\\_et\\_al-Eine\\_Single-Item-Skala\\_zur\\_Erfassung\\_von.pdf?sequence=1&isAllowed=y&lnkname=ssoar-2014-beierlein\\_et\\_al-Eine\\_Single-Item-Skala\\_zur\\_Erfassung\\_von.pdf](https://www.ssoar.info/ssoar/bitstream/handle/document/42670/ssoar-2014-beierlein_et_al-Eine_Single-Item-Skala_zur_Erfassung_von.pdf?sequence=1&isAllowed=y&lnkname=ssoar-2014-beierlein_et_al-Eine_Single-Item-Skala_zur_Erfassung_von.pdf)
- Bélanger, F., & Allport, C. D. (2008). Collaborative technologies in knowledge telework: An exploratory study. *Information Systems Journal*, 18(1), 101–121. <https://doi.org/10.1111/j.1365-2575.2007.00252.x>
- Berger, E. S., von Briel, F., Davidsson, P., & Kuckertz, A. (2021). Digital or not—The future of entrepreneurship and innovation. *Journal of Business Research*, 125, 436–442. <https://doi.org/10.1016/j.jbusres.2019.12.020>
- Bertolotti, F., Mattarelli, E., Vignoli, M., & Macri, D. M. (2015). Exploring the relationship between multiple team membership and team performance: The role of social networks and collaborative technology. *Research Policy*, 44(4), 911–924. <https://doi.org/10.1016/j.respol.2015.01.019>
- Birkinshaw, J. (1997). Entrepreneurship in multinational corporations: The characteristics of subsidiary initiatives. *Strategic Management Journal*, 18(3), 207–229. [https://doi.org/10.1002/\(SICI\)1097-0266\(199703\)18:3<207::AID-SMJ864>3.0.CO;2-Q](https://doi.org/10.1002/(SICI)1097-0266(199703)18:3<207::AID-SMJ864>3.0.CO;2-Q)
- Blanka, C. (2019). An individual-level perspective on intrapreneurship: A review and ways forward. *Review of Managerial Science*, 13(5), 919–961. <https://doi.org/10.1007/s11846-018-0277-0>
- Blohm, I., Riedel, C., Füller, J., & Leimeister, J. M. (2016). Rate or trade? Identifying winning ideas in open idea sourcing. *Information Systems Research*, 27(1), 27–48. <https://doi.org/10.1287/isre.2015.0605>
- Brislin, R. W. (1970). Back-translation for cross-cultural research. *Journal of Cross-Cultural Psychology*, 1(3), 185–216. <https://doi.org/10.1177/135910457000100301>
- Brundin, E., Patzelt, H., & Shepherd, D. A. (2008). Managers' emotional displays and employees' willingness to act entrepreneurially. *Journal of Business Venturing*, 23(2), 221–243. <https://doi.org/10.1016/j.jbusvent.2006.10.009>
- Butler, J. S., Garg, R., & Stephens, B. (2020). Social networks, funding, and regional advantages in technology entrepreneurship: An empirical analysis. *Information Systems Research*, 31(1), 198–216. <https://doi.org/10.1287/isre.2019.0881>
- Byrne, J., Delmar, F., Fayolle, A., & Lamine, W. (2016). Training corporate entrepreneurs: An action learning approach. *Small Business Economics*, 47(2), 479–506. <https://doi.org/10.1007/s11187-016-9734-9>
- Carroll, J. D., & Green, P. E. (1995). Psychometric methods in marketing research: Part I, conjoint analysis. *Journal of Marketing Research*, 32(4), 385–391. <https://doi.org/10.1177/002224379503200401>
- Cavanaugh, G. F., & Fritzsche, D. J. (1985). Using vignettes in business ethics research. In L. E. Preston (Ed.), *Research in corporate social performance and policy* (Vol. 7, pp. 279–293). JAI Press.
- Chalmers, D., MacKenzie, N. G., & Carter, S. (2021). Artificial intelligence and entrepreneurship: Implications for venture creation in the fourth industrial revolution. *Entrepreneurship Theory and Practice*, 45(5), 1028–1053. <https://doi.org/10.1177/1042258720934581>
- Chen, W., & Lee, K.-H. (2013). Sharing, liking, commenting, and distressed? The pathway between Facebook interaction and psychological distress. *Cyberpsychology, Behavior and Social Networking*, 16(10), 728–734. <https://doi.org/10.1089/cyber.2012.0272>
- Chen, Y., Wang, Y., Nevo, S., Benitez-Amado, J., & Kou, G. (2015). IT capabilities and product innovation performance: The roles of corporate entrepreneurship and competitive intensity. *Information & Management*, 52(6), 643–657. <https://doi.org/10.1016/j.im.2015.05.003>
- Compeau, D. R., & Higgins, C. A. (1995). Computer self-efficacy: Development of a measure and initial test. *MIS Quarterly*, 19(2), 189–211. <https://doi.org/10.2307/249688>
- Cooksey, R. (1996). *Judgment analysis: Theory, methods, and applications*. Academic Press.
- Davidsson, P., Recker, J., & von Briel, F. (2020). External enablement of new venture creation: A framework. *Academy of Management Perspectives*, 34(3), 311–332. <https://doi.org/10.5465/amp.2017.0163>
- de Villiers-Scheepers, J. M. (2012). Antecedents of strategic corporate entrepreneurship. *European Business Review*, 24(5), 400–424. <https://doi.org/10.1108/09555341211254508>
- Dellermann, D., Lipusch, N., Ebel, P., & Leimeister, J. M. (2019). Design principles for a hybrid intelligence decision support system for business model validation. *Electronic Markets*, 29(3), 423–441. <https://doi.org/10.1007/s12525-018-0309-2>
- Dess, G. (2003). Emerging issues in corporate entrepreneurship. *Journal of Management*, 29(3), 351–378. [https://doi.org/10.1016/S0149-2063\(03\)00015-1](https://doi.org/10.1016/S0149-2063(03)00015-1)



- Dewett, T. (2007). Linking intrinsic motivation, risk taking, and employee creativity in an R&D environment. *R&D Management*, 37(3), 197–208. <https://doi.org/10.1111/j.1467-9310.2007.00469.x>
- Dimov, D. (2007). Beyond the single-person, single-insight attribution in understanding entrepreneurial opportunities. *Entrepreneurship Theory and Practice*, 31(5), 713–731. <https://doi.org/10.1111/j.1540-6520.2007.00196.x>
- Doll, W. J., & Deng, X. (2001). The collaborative use of information technology. *Information Resources Management Journal*, 14(2), 6–16. <https://doi.org/10.4018/irmj.2001040101>
- Douglas, E. J., & Fitzsimmons, J. R. (2013). Intrapreneurial intentions versus entrepreneurial intentions: Distinct constructs with different antecedents. *Small Business Economics*, 41(1), 115–132. <https://doi.org/10.1007/s11187-012-9419-y>
- Drover, W., Wood, M. S., & Payne, G. T. (2014). The effects of perceived control on venture capitalist investment decisions: A configurational perspective. *Entrepreneurship Theory and Practice*, 38(4), 833–861. <https://doi.org/10.1111/etap.12012>
- Fischer, M., Völckner, F., & Sattler, H. (2010). How important are brands? A cross-category, cross-country study. *Journal of Marketing Research*, 47(5), 823–839. <https://doi.org/10.1509/jmkr.47.5.823>
- Fischhoff, B. (1988). Judgement and decision-making. In E. Sternberg & E. Smith (Eds.), *The psychology of human thought* (pp. 155–187). Cambridge University Press.
- Fitzsimmons, J. R., & Douglas, E. J. (2011). Interaction between feasibility and desirability in the formation of entrepreneurial intentions. *Journal of Business Venturing*, 26(4), 431–440. <https://doi.org/10.1016/j.jbusvent.2010.01.001>
- Fornell, C., & Larcker, D. F. (1981). Evaluating structural equation models with unobservable variables and measurement error. *Journal of Marketing Research*, 18(1), 39–50. <https://doi.org/10.1177/002224378101800104>
- Frese, M., Fay, D., Hilburger, T., Leng, K., & Tag, A. (1997). The concept of personal initiative: Operationalization, reliability and validity in two German samples. *Journal of Occupational and Organizational Psychology*, 70(2), 139–161. <https://doi.org/10.1111/j.2044-8325.1997.tb00639.x>
- Frese, M., Krings, W., Soose, A., & Zempel, J. (1996). Personal initiative at work: Differences between east and west Germany. *Academy of Management Journal*, 39(1), 37–63. <https://doi.org/10.5465/256630>
- Gawke, J. C., Gorgievski, M. J., & Bakker, A. B. (2017). Employee intrapreneurship and work engagement: A latent change score approach. *Journal of Vocational Behavior*, 100, 88–100. <https://doi.org/10.1016/j.jvb.2017.03.002>
- Gawke, J. C., Gorgievski, M. J., & Bakker, A. B. (2018). Personal costs and benefits of employee intrapreneurship: Disentangling the employee intrapreneurship, well-being, and job performance relationship. *Journal of Occupational Health Psychology*, 23(4), 508–519. <https://doi.org/10.1037/ocp0000105>
- Gawke, J. C., Gorgievski, M. J., & Bakker, A. B. (2019). Measuring intrapreneurship at the individual level: Development and validation of the employee intrapreneurship scale (EIS). *European Management Journal*, 37(6), 806–817. <https://doi.org/10.1016/j.emj.2019.03.001>
- Gerards, R., van Wetten, S., & van Sambeek, C. (2021). New ways of working and intrapreneurial behaviour: The mediating role of transformational leadership and social interaction. *Review of Managerial Science*, 15(7), 2075–2110. <https://doi.org/10.1007/s11846-020-00412-1>
- German Federal Ministry for Economic Affairs and Energy. (2019). *Industrial strategy 2030: Guidelines for a German and European industrial policy*. [https://www.bmwi.de/Redaktion/EN/Publikationen/EN/Industrial-strategy-2030.pdf?\\_\\_blob=publicationFile&v=7](https://www.bmwi.de/Redaktion/EN/Publikationen/EN/Industrial-strategy-2030.pdf?__blob=publicationFile&v=7)
- German Federal Ministry of Education and Research. (2022, June). *Total innovation expenditure, by sector groups and employment size classes*. <https://www.datenportal.bmbf.de/portal/en/Table-1.8.8.html>
- German Federal Statistical Office. (2020, March 4). *Working hours in 2018: Longest hours worked in agriculture and forestry, shortest in manufacturing*. [https://www.destatis.de/EN/Press/2020/03/PE20\\_071\\_133.html](https://www.destatis.de/EN/Press/2020/03/PE20_071_133.html)
- German Federal Statistical Office. (2022). *Industrial sector in Germany remains stronger than in many other EU member states*. [https://www.destatis.de/Europa/EN/Topic/Industry-trade-services/Industry\\_GVA.html](https://www.destatis.de/Europa/EN/Topic/Industry-trade-services/Industry_GVA.html)
- Germonprez, M., & Hovorka, D. S. (2013). Member engagement within digitally enabled social network communities: New methodological considerations. *Information Systems Journal*, 23(6), 525–549. <https://doi.org/10.1111/isj.12021>
- Glaser, L., Stam, W., & Takeuchi, R. (2016). Managing the risks of proactivity: A multilevel study of initiative and performance in the middle management context. *Academy of Management Journal*, 59(4), 1339–1360. <https://doi.org/10.5465/amj.2014.0177>
- Globocnik, D., & Salomo, S. (2015). Do formal management practices impact the emergence of bootlegging behavior? *Journal of Product Innovation Management*, 32(4), 505–521. <https://doi.org/10.1111/jpim.12215>
- Green, P. E., & Srinivasan, V. (1978). Conjoint analysis in consumer research: Issues and outlook. *Journal of Consumer Research*, 5(2), 103–123. <https://doi.org/10.1086/208721>
- Greenberger, D. B., & Sexton, D. L. (1988). An interactive model of new venture initiation. *Journal of Small Business Management*, 26(3), 1–7.
- Grégoire, D. A., Binder, J. K., & Rauch, A. (2019). Navigating the validity tradeoffs of entrepreneurship research experiments: A systematic review and best-practice suggestions. *Journal of Business Venturing*, 34(2), 284–310. <https://doi.org/10.1016/j.jbusvent.2018.10.002>

- Gustavsson, M., & Ljungberg, J. (2018). Entrepreneurship in the digital society. In J. Pries-Heje, S. Ram, & M. Rosemann (Eds.), *Proceedings of the 39th International Conference on Information Systems* (pp. 1–12). Association for Information Systems. <https://aisel.aisnet.org/ics2018/innovation/Presentations/17>
- Hahn, G., & Shapiro, S. (1966). *A catalogue and computer program for the design and analysis of orthogonal symmetric and asymmetric fractional factorial designs* (Report No. 66-C-165). General Electric Corporation.
- Halme, M., Lindeman, S., & Linna, P. (2012). Innovation for inclusive business: Intrapreneurial bricolage in multinational corporations. *Journal of Management Studies*, 49(4), 743–784. <https://doi.org/10.1111/j.1467-6486.2012.01045.x>
- Hammond, K. R., & Adelman, L. (1976). Science, values, and human judgment. *Science*, 194(4263), 389–396. <https://doi.org/10.1126/science.194.4263.389>
- Hauswald, H., Hack, A., Kellermanns, F. W., & Patzelt, H. (2016). Attracting new talent to family firms: Who is attracted and under what conditions? *Entrepreneurship Theory and Practice*, 40(5), 963–989. <https://doi.org/10.1111/etap.12153>
- Havakhor, T., Soror, A. A., & Sabherwal, R. (2018). Diffusion of knowledge in social media networks: Effects of reputation mechanisms and distribution of knowledge roles. *Information Systems Journal*, 28(1), 104–141. <https://doi.org/10.1111/isj.12127>
- Hayton, J. C., George, G., & Zahra, S. A. (2002). National culture and entrepreneurship: A review of behavioral research. *Entrepreneurship Theory and Practice*, 26(4), 33–52. <https://doi.org/10.1177/104225870202600403>
- Hisrich, R. D. (1990). Entrepreneurship/intrapreneurship. *American Psychologist*, 45(2), 209–222. <https://doi.org/10.1037/0003-066X.45.2.209>
- Holland, D. V., & Garrett, R. P. (2015). Entrepreneur start-up versus persistence decisions: A critical evaluation of expectancy and value. *International Small Business Journal: Researching Entrepreneurship*, 33(2), 194–215. <https://doi.org/10.1177/0266242613480375>
- Hornsby, J. S., Kuratko, D. F., Shepherd, D. A., & Bott, J. P. (2009). Managers' corporate entrepreneurial actions: Examining perception and position. *Journal of Business Venturing*, 24(3), 236–247. <https://doi.org/10.1016/j.jbusvent.2008.03.002>
- Hornsby, J. S., Kuratko, D. F., & Zahra, S. A. (2002). Middle managers' perception of the internal environment for corporate entrepreneurship: Assessing a measurement scale. *Journal of Business Venturing*, 17(3), 253–273. [https://doi.org/10.1016/S0883-9026\(00\)00059-8](https://doi.org/10.1016/S0883-9026(00)00059-8)
- Hornsby, J. S., Naffziger, D. W., Kuratko, D. F., & Montagno, R. V. (1993). An interactive model of the corporate entrepreneurship process. *Entrepreneurship Theory and Practice*, 17(2), 29–37. <https://doi.org/10.1177/104225879301700203>
- Hsu, D. K., Simmons, S. A., & Wieland, A. M. (2017). Designing entrepreneurship experiments. *Organizational Research Methods*, 20(3), 379–412. <https://doi.org/10.1177/1094428116685613>
- Janssen, O. (2000). Job demands, perceptions of effort-reward fairness and innovative work behaviour. *Journal of Occupational and Organizational Psychology*, 73(3), 287–302. <https://doi.org/10.1348/096317900167038>
- Jantan, H., Razak, A., & Ali, Z. (2010). Intelligent techniques for decision support system in human resource management. In G. Devlin (Ed.), *Decision support systems: Advances in* (pp. 261–276). IntechOpen. <https://doi.org/10.5772/39401>
- Jarrah, M. H. (2018). Artificial intelligence and the future of work: Human-AI symbiosis in organizational decision making. *Business Horizons*, 61(4), 577–586. <https://doi.org/10.1016/j.bushor.2018.03.007>
- Jarvis, C. B., MacKenzie, S. B., & Podsakoff, P. M. (2003). A critical review of construct indicators and measurement model misspecification in marketing and consumer research. *Journal of Consumer Research*, 30(2), 199–218. <https://doi.org/10.1086/376806>
- Kallinikos, J., Aaltonen, A., & Marton, A. (2013). The ambivalent ontology of digital artifacts. *MIS Quarterly*, 37(2), 357–370.
- Kellogg, K. C., Valentine, M. A., & Christin, A. (2020). Algorithms at work: The new contested terrain of control. *Academy of Management Annals*, 14(1), 366–410. <https://doi.org/10.5465/annals.2018.0174>
- Krueger, N., & Dickson, P. R. (1993). Perceived self-efficacy and perceptions of opportunity and threat. *Psychological Reports*, 72(3), 1235–1240. <https://doi.org/10.2466/pr0.1993.72.3c.1235>
- Krueger, N., & Dickson, P. R. (1994). How believing in ourselves increases risk taking: Perceived self-efficacy and opportunity recognition. *Decision Sciences*, 25(3), 385–400. <https://doi.org/10.1111/j.1540-5915.1994.tb00810.x>
- Kuratko, D. F., Ireland, R. D., Covin, J. G., & Hornsby, J. S. (2005). A model of middle-level managers' entrepreneurial behavior. *Entrepreneurship Theory and Practice*, 29(6), 699–716. <https://doi.org/10.1111/j.1540-6520.2005.00104.x>
- Kuratko, D. F., Ireland, R. D., & Hornsby, J. S. (2004). Corporate entrepreneurship behavior among managers: A review of theory, research, and practice. In D. F. Kuratko, R. Ireland, & J. S. Hornsby (Eds.), *Advances in entrepreneurship, firm emergence and growth* (Vol. 7, pp. 7–45). Emerald. [https://doi.org/10.1016/S1074-7540\(04\)07002-3](https://doi.org/10.1016/S1074-7540(04)07002-3)
- Kuratko, D. F., Montagno, R. V., & Hornsby, J. S. (1990). Developing an intrapreneurial assessment instrument for an effective corporate entrepreneurial environment. *Strategic Management Journal*, 11, 49–58.
- Lam, H. K., Yeung, A. C., & Cheng, T. E. (2016). The impact of firms' social media initiatives on operational efficiency and innovativeness. *Journal of Operations Management*, 47-48(1), 28–43. <https://doi.org/10.1016/j.jom.2016.06.001>
- Lee, S. H., & Wong, P. K. (2004). An exploratory study of technopreneurial intentions: A career anchor perspective. *Journal of Business Venturing*, 19(1), 7–28. [https://doi.org/10.1016/S0883-9026\(02\)00112-X](https://doi.org/10.1016/S0883-9026(02)00112-X)

- Leonardi, P. M. (2014). Social media, knowledge sharing, and innovation: Toward a theory of communication visibility. *Information Systems Research*, 25(4), 796–816. <https://doi.org/10.1287/isre.2014.0536>
- Leonardi, P. M., & Vaast, E. (2017). Social media and their affordances for organizing: A review and agenda for research. *Academy of Management Annals*, 11(1), 150–188. <https://doi.org/10.5465/annals.2015.0144>
- Li, L., Su, F., Zhang, W., & Mao, J.-Y. (2018). Digital transformation by SME entrepreneurs: A capability perspective. *Information Systems Journal*, 28(6), 1129–1157. <https://doi.org/10.1111/isj.12153>
- Lonati, S., Quiroga, B. F., Zehnder, C., & Antonakis, J. (2018). On doing relevant and rigorous experiments: Review and recommendations. *Journal of Operations Management*, 64(1), 19–40. <https://doi.org/10.1016/j.jom.2018.10.003>
- Louviere, J. J., & Hout, M. (1988). *Analyzing decision making: Metric conjoint analysis*. SAGE.
- Lyytinen, K., Yoo, Y., & Boland, R. J., Jr. (2016). Digital product innovation within four classes of innovation networks. *Information Systems Journal*, 26(1), 47–75. <https://doi.org/10.1111/isj.12093>
- MacKenzie, S. B., Podsakoff, P. M., & Podsakoff, N. P. (2011). Construct measurement and validation procedures in MIS and behavioral research: Integrating new and existing techniques. *MIS Quarterly*, 35(2), 293–334. <https://doi.org/10.2307/23044045>
- Madrid, H. P., Patterson, M. G., Birdi, K. S., Leiva, P. I., & Kausel, E. E. (2014). The role of weekly high-activated positive mood, context, and personality in innovative work behavior: A multilevel and interactional model. *Journal of Organizational Behavior*, 35(2), 234–256. <https://doi.org/10.1002/job.1867>
- Majchrzak, A., & Markus, M. (2013). Technology affordances and constraints theory (of MIS). In E. Kessler (Ed.), *Encyclopedia of management theory* (pp. 832–836). SAGE.
- Malsbender, A., Hoffmann, S., & Becker, J. (2014). Aligning capabilities and social media affordances for open innovation in governments. *Australasian Journal of Information Systems*, 18(3), 317–330. <https://doi.org/10.3127/ajis.v18i3.1100>
- Martín-Rojas, R., Garrido-Moreno, A., & García-Morales, V. J. (2020). Fostering corporate entrepreneurship with the use of social media tools. *Journal of Business Research*, 112, 396–412. <https://doi.org/10.1016/j.jbusres.2019.11.072>
- McFarland, L. A., & Ployhart, R. E. (2015). Social media: A contextual framework to guide research and practice. *Journal of Applied Psychology*, 100(6), 1653–1677. <https://doi.org/10.1037/a0039244>
- McGrath, R. G. (1999). Falling forward: Real options reasoning and entrepreneurial failure. *Academy of Management Review*, 24(1), 13–30. <https://doi.org/10.5465/amr.1999.1580438>
- McGrath, R. G., & MacMillan, I. C. (2000). *The entrepreneurial mindset: Strategies for continuously creating opportunity in an age of uncertainty*. Harvard Business Press.
- Miller, D. (1983). The correlates of entrepreneurship in three types of firms. *Management Science*, 29(7), 770–791. <https://doi.org/10.1287/mnsc.29.7.770>
- Monsen, E., Patzelt, H., & Saxton, T. (2010). Beyond simple utility: Incentive design and trade-offs for corporate employee-entrepreneurs. *Entrepreneurship Theory and Practice*, 34(1), 105–130. <https://doi.org/10.1111/j.1540-6520.2009.00314.x>
- Moriano, J. A., Molero, F., Topa, G., & Lévy Mangin, J.-P. (2014). The influence of transformational leadership and organizational identification on intrapreneurship. *International Entrepreneurship and Management Journal*, 10(1), 103–119. <https://doi.org/10.1007/s11365-011-0196-x>
- Murnieks, C. Y., Cardon, M. S., Sudek, R., White, T. D., & Brooks, W. T. (2016). Drawn to the fire: The role of passion, tenacity and inspirational leadership in angel investing. *Journal of Business Venturing*, 31(4), 468–484. <https://doi.org/10.1016/j.jbusvent.2016.05.002>
- Nambisan, S. (2017). Digital entrepreneurship: Toward a digital technology perspective of entrepreneurship. *Entrepreneurship Theory and Practice*, 41(6), 1029–1055. <https://doi.org/10.1111/etap.12254>
- Nambisan, S., & Baron, R. A. (2021). On the costs of digital entrepreneurship: Role conflict, stress, and venture performance in digital platform-based ecosystems. *Journal of Business Research*, 125, 520–532. <https://doi.org/10.1016/j.jbusres.2019.06.037>
- Nambisan, S., Lyytinen, K., Majchrzak, A., & Song, M. (2017). Digital innovation management: Reinventing innovation management research in a digital world. *MIS Quarterly*, 41(1), 223–238.
- Nambisan, S., Siegel, D., & Kenney, M. (2018). On open innovation, platforms, and entrepreneurship. *Strategic Entrepreneurship Journal*, 12(3), 354–368. <https://doi.org/10.1002/sej.1300>
- Nambisan, S., Wright, M., & Feldman, M. (2019). The digital transformation of innovation and entrepreneurship: Progress, challenges and key themes. *Research Policy*, 48(8), 103773. <https://doi.org/10.1016/j.respol.2019.03.018>
- Neessen, P. C. M., Caniëls, M. C. J., Vos, B., & de Jong, J. P. (2019). The intrapreneurial employee: Toward an integrated model of intrapreneurship and research agenda. *International Entrepreneurship and Management Journal*, 15(2), 545–571. <https://doi.org/10.1007/s11365-018-0552-1>
- New Work SE. (2021, January). *Facts and figures*. <https://advertising.xing.com/facts-and-figures>
- Ojala, A. (2016). Business models and opportunity creation: How IT entrepreneurs create and develop business models under uncertainty. *Information Systems Journal*, 26(5), 451–476. <https://doi.org/10.1111/isj.12078>

- Olanrewaju, A.-S. T., Hossain, M. A., Whiteside, N., & Mercieca, P. (2020). Social media and entrepreneurship research: A literature review. *International Journal of Information Management*, 50, 90–110. <https://doi.org/10.1016/j.ijinfomgt.2019.05.011>
- Parker, S. C. (2011). Intrapreneurship or entrepreneurship? *Journal of Business Venturing*, 26(1), 19–34. <https://doi.org/10.1016/j.jbusvent.2009.07.003>
- Parth, S., Manoharan, B., Parthiban, R., Qureshi, I., Bhatt, B., & Rakshit, K. (2021). Digital technology-enabled transformative consumer responsibility: A case study. *European Journal of Marketing*, 55(9), 2538–2565. <https://doi.org/10.1108/EJM-02-2020-0139>
- Parthiban, R., Qureshi, I., Bandyopadhyay, S., Bhatt, B., & Jaikumar, S. (2020). Leveraging ICT to overcome complementary institutional voids: Insights from institutional work by a social enterprise to help marginalized. *Information Systems Frontiers*, 22(3), 633–653. <https://doi.org/10.1007/s10796-020-09991-6>
- Parthiban, R., Qureshi, I., Bandyopadhyay, S., & Jaikumar, S. (2021). Digitally mediated value creation for non-commodity base of the pyramid producers. *International Journal of Information Management*, 56, 102256. <https://doi.org/10.1016/j.ijinfomgt.2020.102256>
- Peterman, N. E., & Kennedy, J. (2003). Enterprise education: Influencing students' perceptions of entrepreneurship. *Entrepreneurship Theory and Practice*, 28(2), 129–144. <https://doi.org/10.1046/j.1540-6520.2003.00035.x>
- Petzsche, V., Rabl, T., Franzke, S., & Baum, M. (2022). Perceived gain or loss? How digital affordances influence employee corporate entrepreneurship participation likelihood. *European Management Review*. Advance online publication. <https://doi.org/10.1111/emre.12530>
- Phillips-Wren, G., Mora, M., Forgionne, G. A., & Gupta, J. (2009). An integrative evaluation framework for intelligent decision support systems. *European Journal of Operational Research*, 195(3), 642–652. <https://doi.org/10.1016/j.ejor.2007.11.001>
- Qureshi, I., Pan, S. L., & Zheng, Y. (2021). Digital social innovation: An overview and research framework. *Information Systems Journal*, 31(5), 647–671. <https://doi.org/10.1111/isj.12362>
- Rao, V. R. (2014). *Applied conjoint analysis*. Springer. <https://doi.org/10.1007/978-3-540-87753-0>
- Recker, J., Mendling, J., & Hahn, C. (2013). How collaborative technology supports cognitive processes in collaborative process modeling: A capabilities-gains-outcome model. *Information Systems*, 38(8), 1031–1045. <https://doi.org/10.1016/j.is.2013.04.001>
- Rigtering, J., & Weitzel, U. (2013). Work context and employee behaviour as antecedents for intrapreneurship. *International Entrepreneurship and Management Journal*, 9(3), 337–360. <https://doi.org/10.1007/s11365-013-0258-3>
- Rigtering, J., Weitzel, U., & Muehlfeld, K. (2019). Increasing quantity without compromising quality: How managerial framing affects intrapreneurship. *Journal of Business Venturing*, 34(2), 224–241. <https://doi.org/10.1016/j.jbusvent.2018.11.002>
- Roberts, E. B. (1991). *Entrepreneurs in high technology: Lessons from MIT and beyond*. Oxford University Press.
- Rosin, A. F., Proksch, D., Stubner, S., & Pinkwart, A. (2020). Digital new ventures: Assessing the benefits of digitalization in entrepreneurship. *Journal of Small Business Strategy*, 30(2), 59–71.
- Sahut, J.-M., landoli, L., & Teulon, F. (2021). The age of digital entrepreneurship. *Small Business Economics*, 56(3), 1159–1169. <https://doi.org/10.1007/s11187-019-00260-8>
- Sambamurthy, V., Bharadwaj, A., & Grover, V. (2003). Shaping agility through digital options: Reconceptualizing the role of information technology in contemporary firms. *MIS Quarterly*, 27(2), 237–263. <https://doi.org/10.2307/30036530>
- Sardeshmukh, S. R., & Corbett, A. C. (2011). The duality of internal and external development of successors: Opportunity recognition in family firms. *Family Business Review*, 24(2), 111–125. <https://doi.org/10.1177/0894486510391783>
- Sarma, V. V. S. (1994). Decision making in complex systems. *Systems Practice*, 7(4), 399–407. <https://doi.org/10.1007/BF02169361>
- Schneckenberg, D., Truong, Y., & Mazloomi, H. (2015). Microfoundations of innovative capabilities: The leverage of collaborative technologies on organizational learning and knowledge management in a multinational corporation. *Technological Forecasting and Social Change*, 100, 356–368. <https://doi.org/10.1016/j.techfore.2015.08.008>
- Secundo, G., Del Vecchio, P., & Mele, G. (2020). Social media for entrepreneurship: Myth or reality? A structured literature review and a future research agenda. *International Journal of Entrepreneurial Behavior & Research*, 27(1), 149–177. <https://doi.org/10.1108/IJEBR-07-2020-0453>
- Shao, Z., Li, X., & Wang, Q. (2022). From ambidextrous learning to digital creativity: An integrative theoretical framework. *Information Systems Journal*, 32(3), 544–572. <https://doi.org/10.1111/isj.12361>
- Sharma, P., & Chrisman, J. J. (1999). Toward a reconciliation of the definitional issues in the field of corporate entrepreneurship. *Entrepreneurship Theory and Practice*, 23(3), 11–28. <https://doi.org/10.1177/104225879902300302>
- Shen, K. N., Lindsay, V., & Xu, Y. C. (2018). Digital entrepreneurship. *Information Systems Journal*, 28(6), 1125–1128. <https://doi.org/10.1111/isj.12219>
- Shepherd, D. A. (1999). Venture capitalists' assessment of new venture survival. *Management Science*, 45(5), 621–632. <https://doi.org/10.1287/mnsc.45.5.621>
- Shepherd, D. A., Haynie, J. M., & Patzelt, H. (2013). Project failures arising from corporate entrepreneurship: Impact of multiple project failures on employees' accumulated emotions, learning, and motivation. *Journal of Product Innovation Management*, 30(5), 880–895. <https://doi.org/10.1111/jpim.12035>



- Shepherd, D. A., & Patzelt, H. (2017). Researching entrepreneurial decision making. In D. A. Shepherd & H. Patzelt (Eds.), *Trailblazing in entrepreneurship: Creating new paths for understanding the field* (pp. 257–285). Palgrave MacMillan. <https://doi.org/10.1007/978-3-319-48701-4>
- Shepherd, D. A., & Zacharakis, A. (1997). Conjoint analysis: A window of opportunity for entrepreneurship research. In E. Katz (Ed.), *Advances in entrepreneurship, firm emergence and growth* (Vol. 3, pp. 203–248). JAI Press.
- Shepherd, D. A., Zacharakis, A., & Baron, R. A. (2003). VCs' decision processes. *Journal of Business Venturing*, 18(3), 381–401. [https://doi.org/10.1016/S0883-9026\(02\)00099-X](https://doi.org/10.1016/S0883-9026(02)00099-X)
- Shih, H., Lai, K., & Cheng, T. C. E. (2015). Examining structural, perceptual, and attitudinal influences on the quality of information sharing in collaborative technology use. *Information Systems Frontiers*, 17(2), 455–470. <https://doi.org/10.1007/s10796-013-9429-6>
- Shrestha, Y. R., Ben-Menahem, S. M., & von Krogh, G. (2019). Organizational decision-making structures in the age of artificial intelligence. *California Management Review*, 61(4), 66–83. <https://doi.org/10.1177/0008125619862257>
- Sigala, M., & Chalkiti, K. (2015). Knowledge management, social media and employee creativity. *International Journal of Hospitality Management*, 45, 44–58. <https://doi.org/10.1016/j.ijhm.2014.11.003>
- Simsek, Z., Lubatkin, M. H., Veiga, J. F., & Dino, R. N. (2009). The role of an entrepreneurially alert information system in promoting corporate entrepreneurship. *Journal of Business Research*, 62(8), 810–817. <https://doi.org/10.1016/j.jbusres.2008.03.002>
- Smith, C., Smith, J. B., & Shaw, E. (2017). Embracing digital networks: Entrepreneurs' social capital online. *Journal of Business Venturing*, 32(1), 18–34. <https://doi.org/10.1016/j.jbusvent.2016.10.003>
- Snijders, T. A. B., & Bosker, R. J. (1999). *Multilevel analysis: An introduction to basic and advanced multilevel modelling*. SAGE.
- Steininger, D. M. (2019). Linking information systems and entrepreneurship: A review and agenda for IT-associated and digital entrepreneurship research. *Information Systems Journal*, 29(2), 363–407. <https://doi.org/10.1111/isj.12206>
- Stewart, T. R. (1988). Judgment analysis: Procedures. In B. Brehmer & C. Joyce (Eds.), *Human judgement: The SJT view* (pp. 41–74). Elsevier. [https://doi.org/10.1016/S0166-4115\(08\)62170-6](https://doi.org/10.1016/S0166-4115(08)62170-6)
- Subramanian, K. R. (2017). Influence of social media in interpersonal communication. *International Journal of Scientific Progress and Research*, 38(2), 70–75. [https://www.ijsp.com/citations/v38n2/IJSPR\\_3802\\_2069.pdf](https://www.ijsp.com/citations/v38n2/IJSPR_3802_2069.pdf)
- Treem, J. W., & Leonardi, P. M. (2013). Social media use in organizations: Exploring the affordances of visibility, editability, persistence, and association. *Annals of the International Communication Association*, 36(1), 143–189. <https://doi.org/10.1080/23808985.2013.11679130>
- Turró, A., Urbano, D., & Peris-Ortiz, M. (2014). Culture and innovation: The moderating effect of cultural values on corporate entrepreneurship. *Technological Forecasting and Social Change*, 88, 360–369. <https://doi.org/10.1016/j.techfore.2013.10.004>
- Venkatesh, V. (2000). Determinants of perceived ease of use: Integrating control, intrinsic motivation, and emotion into the technology acceptance model. *Information Systems Research*, 11(4), 342–365. <https://doi.org/10.1287/isre.11.4.342.11872>
- Venkatesh, V., Shaw, J. D., Sykes, T. A., Wamba, S. F., & Macharia, M. (2017). Networks, technology, and entrepreneurship: A field quasi-experiment among women in rural India. *Academy of Management Journal*, 60(5), 1709–1740. <https://doi.org/10.5465/amj.2015.0849>
- von Briel, F., Davidsson, P., & Recker, J. (2018). Digital technologies as external enablers of new venture creation in the IT hardware sector. *Entrepreneurship Theory and Practice*, 42(1), 47–69. <https://doi.org/10.1177/1042258717732779>
- von Briel, F., Recker, J., Selander, L., Jarvenpaa, S. L., Hukal, P., Yoo, Y., Lehmann, J., Chan, Y., Rothe, H., Alpar, P., Fürstenau, D., & Wurm, B. (2021). Researching digital entrepreneurship: Current issues and suggestions for future directions. *Communications of the Association for Information Systems*, 48(1), 284–304. <https://doi.org/10.17705/1CAIS.04833>
- Yukl, G. (2013). *Leadership in organizations* (8th ed.). Pearson Education.
- Yunis, M., Tarhini, A., & El-Kassar, A.-N. (2018). The role of ICT and innovation in enhancing organizational performance: The catalysing effect of corporate entrepreneurship. *Journal of Business Research*, 88, 344–356. <https://doi.org/10.1016/j.jbusres.2017.12.030>
- Zaheer, H., Breyer, Y., & Dumay, J. (2019). Digital entrepreneurship: An interdisciplinary structured literature review and research agenda. *Technological Forecasting and Social Change*, 148, 119735. <https://doi.org/10.1016/j.techfore.2019.119735>
- Zampetakis, L. A., Beldekos, P., & Moustakis, V. S. (2009). “Day-to-day” entrepreneurship within organisations: The role of trait emotional intelligence and perceived organisational support. *European Management Journal*, 27(3), 165–175. <https://doi.org/10.1016/j.emj.2008.08.003>
- Zenebe, A., Alsaaty, F. M., & Anyiwo, D. (2018). Relationship between individual's entrepreneurship intention, and adoption and knowledge of information technology and its applications: An empirical study. *Journal of Small Business & Entrepreneurship*, 30(3), 215–232. <https://doi.org/10.1080/08276331.2017.1397441>

Zhou, J., & George, J. M. (2001). When job dissatisfaction leads to creativity: Encouraging the expression of voice. *Academy of Management Journal*, 44(4), 682–696. <https://doi.org/10.5465/3069410>

**How to cite this article:** Rabl, T., Petzsche, V., Baum, M., & Franzke, S. (2023). Can support by digital technologies stimulate intrapreneurial behaviour? The moderating role of management support for innovation and intrapreneurial self-efficacy. *Information Systems Journal*, 33(3), 567–597. <https://doi.org/10.1111/isj.12413>

## APPENDIX A

### SCENARIO INTRODUCTION IN THE CONJOINT EXPERIMENT

#### Situation

Please put yourself in the following situation:

While chatting with your colleagues, a new and interesting business opportunity comes to your mind. If you wanted to realise it, you would have to act quickly and promptly form a project team. You clearly see that the business opportunity has high potential due to its very innovative nature. A successful implementation of a project that is undertaken to realise this business opportunity could result in a new strategic business unit within your company or an independent spin-off of which you would then be a part. However, you are also aware that such a project would be associated with a high risk of failure, which could possibly have a negative impact on your career.

#### Task

In the following scenarios, the conditions for a project that is undertaken to realise the business opportunity are described based on the following four parameters.

- Support by collaborative technologies
- Support by social media
- Support by intelligent decision support systems
- Management support for innovation

Each parameter has two values: high and low or present and not present. Please assume that these parameters cannot be changed in the medium term, but represent organisational conditions.

Please evaluate each of the scenarios according to whether you would initiate and advance such a project on your own accord (project lead).

Please note:

Please make decisions as best you can based on the information we give you. Please assume that all other parameters of the project and the environment are the same for all scenarios and that all project participants work under the four conditions stated above. Please consider the project under the current economic conditions in Germany and assume that the type and scope of the hypothetical project is comparable to current or previous projects in your company (except for the parameters we show you).

## APPENDIX B

## VARIABLES MANIPULATED IN THE CONJOINT PROFILES

Parameter	Level	Description
Support by collaborative technologies	Present	For the collaboration in the project, <u>collaborative technologies</u> (e.g., instant messaging services, project management systems, work and task management systems) <u>can be used</u> .
	Not present	For the collaboration in the project, <u>collaborative technologies</u> (e.g., instant messaging services, project management systems, work and task management systems) <u>cannot be used</u> .
Support by social media	Present	<u>It is possible to use social media</u> (e.g., social networks, blogs, content communities) in the course of the project.
	Not present	<u>It is not possible to use social media</u> (e.g., social networks, blogs, content communities) in the course of the project.
Support by intelligent decision support systems	Present	For the project work, <u>intelligent decision support systems</u> (e.g., intelligent predictive systems, text mining, machine learning) <u>can be consulted</u> .
	Not present	For the project work, <u>intelligent decision support systems</u> (e.g., intelligent predictive systems, text mining, machine learning) <u>cannot be consulted</u> .
Management support for innovation	High	Management facilitates and promotes employees' innovative behaviour <u>to a large degree by strongly championing innovative ideas and providing the resources required to take innovative actions</u> .
	Low	Management facilitates and promotes employees' innovative behaviour <u>to a minor degree by weakly championing innovative ideas and hardly providing the resources required to take innovative actions</u> .

## APPENDIX C

## SAMPLE CARD FROM THE CONJOINT EXPERIMENT

Parameter	Level	Description
Support by collaborative technologies	Not present	For the collaboration in the project, <u>collaborative technologies</u> (e.g., instant messaging services, project management systems, work and task management systems) <u>cannot be used</u> .
Support by social media	Not present	<u>It is not possible to use social media</u> (e.g., social networks, blogs, content communities) in the course of the project.
Support by intelligent decision support systems	Present	For the project work, <u>intelligent decision support systems</u> (e.g., intelligent predictive systems, text mining, machine learning) <u>can be consulted</u> .
Management support for innovation	High	Management facilitates and promotes employees' innovative behaviour <u>to a large degree by strongly championing innovative ideas and providing the resources required to take innovative actions</u> .

Based on the above description of the conditions for a project that is undertaken to realise the business opportunity, please evaluate:

How do you rate the likelihood that you would initiate and advance such a project on your own accord (project lead)?



## APPENDIX D

## INFORMATION ON INDIVIDUAL-LEVEL CONSTRUCTS AND THEIR VALIDITY AND RELIABILITY

Construct	Items	Factor loadings (before scale purification)	Factor loadings (after scale purification)	Average variance extracted (after scale purification)	Cronbach's alpha (after scale purification)
Intrapreneurial self-efficacy	I have confidence in convincing top management of the feasibility of a venture.	0.66	0.82	0.51	0.82
	I have confidence in calling top management's attention to new opportunities.	0.66	0.73		
	I have confidence in generating new ideas.	0.68	0.72		
	I have confidence in taking the initiative to realise new products.	0.75	0.67		
	I have confidence in obtaining support of others for a venture.	0.61	0.64		
	I have confidence in developing new products	0.60	Removed		
	I have confidence in resisting new ideas despite considerable internal options.	0.62	Removed		
	I have confidence in introducing new methods of production, marketing, and management.	0.63	Removed		
	I have confidence in strategic planning.	0.54	Removed		
	I have confidence in taking on responsibility for ideas and decisions.	0.47	Removed		
Personal initiative	I am particularly good at realising ideas.	0.65	0.84	0.52	0.76
	I use opportunities quickly in order to attain my goals.	0.72	0.75		
	Whenever there is a chance to get actively involved, I take it.	0.62	0.68		
	I take initiative immediately even when others do not.	0.64	0.60		
	I actively attack problems.	0.61	Removed		

Construct	Items	Factor loadings (before scale purification)	Factor loadings (after scale purification)	Average variance extracted (after scale purification)	Cronbach's alpha (after scale purification)
	Whenever something goes wrong, I search for a solution immediately.	0.48	Removed		
	Usually I do more than I am asked to do.	0.42	Removed		