IMDS
126,4

1154

Received 17 March 2025
Revised 4 July 2025
19 August 2025
Accepted 28 August 2025

Organizational alertness and IT-enabled crisis strategies: a quantitative study on exploration, exploitation, and ambidexterity

Everist Limaj
Vienna University of Economics and Business, Vienna, Austria
Nikolaus Obwegeser
Berner Fachhochschule, Bern, Switzerland, and
Edward W. N. Bernroider
Vienna University of Economics and Business, Vienna, Austria

Abstract

Purpose – The purpose of this study is to examine how organizational alertness is related with IT exploration, IT exploitation, and IT ambidexterity as crisis response strategies and to assess their impact on competitive performance through market capitalizing and operational adjustment under external crisis conditions.

Design/methodology/approach – A research model is developed integrating organizational alertness with IT exploration for swift market capitalizing, IT exploitation for swift operational adjustment, and IT ambidexterity for the simultaneous IT exploration and IT exploitation to investigate organizations' strategic specialization in crisis response. Following a survey design approach, data collected from 166 organizations in Austria, Germany and Switzerland during the COVID-19 crisis are analyzed using partial least squares path modeling, mediation and moderation analyses.

Findings – Our results highlight the important role of organizational alertness in all three strategies in the crisis context. IT exploration enhances competitive performance through market capitalizing, while IT exploitation ensures operational stability but does not directly improve competitiveness. Contrary to previous research conducted in stable environments, IT ambidexterity generally weakens crisis responses unless both IT exploration and exploitation are highly developed.

Originality/value – Our study offers a novel perspective on IT-enabled crisis response strategies, emphasizing the role of organizational alertness in shaping organizations' specialization in either IT exploration or IT exploitation rather than balancing both. Prior research has primarily examined IT ambidexterity in stable environments and assumed universal benefits. Our conceptualization challenges this view by integrating alertness-driven strategic specialization with IT-enabled crisis adaptation and empirically testing it in a high-uncertainty crisis context. We extend ambidexterity theory by demonstrating its contingent applicability and highlighting when organizations should prioritize IT exploration or exploitation for effective crisis management.

Keywords IT exploration and exploitation, IT ambidexterity, Organizational alertness, Crisis response strategy, Organizational capabilities, Competitive performance

Paper type Research article

1. Introduction

In a business landscape affected by recurring crises, defined as low-probability, high-impact events that disrupt the status quo (Salamzadeh and Dana, 2022), organizations face the critical challenge of adopting strategies that ensure both organizational stability and competitive performance. Crises are characterized by high uncertainty and intense complexity, forcing organizations to make swift decisions under resource constraints, amplifying the tension between achieving short-term survival and sustaining long-term goals (Carmine *et al*., 2021).

Industrial Management & Data Systems
Vol. 126 No. 4, 2026
pp. 1154-1180
Emerald Publishing Limited
e-ISSN: 1758-5783
p-ISSN: 0263-5577
DOI 10.1108/IMDS-01-2025-0067

Considering this context, organizational risk management not only needs to develop mechanisms to safeguard operations, but also to capture emerging opportunities amidst disruptions more strategically (Herbane *et al*., 2004). In this new "under pressure" business environment, organizations need capabilities for both fast sensing and agile responding to such high-risk events (e.g. pandemics, geopolitical conflicts, regulatory shifts, or economic crises) (Boh *et al*., 2022). Organizational alertness can serve as an essential sensing component, as it refers to the ability of an organization to recognize early signals of threats or opportunities and to orchestrate resources effectively in response (Järveläinen, 2013). Given the deep integration of digital technologies in contemporary organizations, these responses are increasingly intertwined with IT capabilities. Consequently, there is a growing need to understand how IT-enabled strategies help organizations navigate crisis-driven change (Benitez *et al*., 2023; Li *et al*., 2022; Tallon *et al*., 2022).

Ambidexterity theory, which explains how organizations balance exploration and exploitation strategies (March, 1991; O'Reilly and Tushman, 2013), provides a useful theoretical lens for examining the effectiveness of IT-enabled response strategies (Bettiol *et al*., 2023; Chou *et al*., 2024; Osiyevskyy *et al*., 2020). Recent advances in IT ambidexterity research emphasize that organizations need to cultivate both IT exploration and IT exploitation capabilities for achieving organizational adaptability (Lee *et al*., 2015; Liang *et al*., 2022; Syed *et al*., 2020). IT exploration capability captures the organization's potential to acquire and experiment with new IT resources and practices. IT exploitation capability entails an organization's proficiency in utilizing and refining existing IT resources and practices (Atuahene-Gima, 2005; Lee *et al*., 2015; Nambisan *et al*., 1999; Ravichandran *et al*., 2005). IT ambidexterity represents the organization's simultaneous pursuit of IT exploration and IT exploitation, such that the combined effect of both capabilities eventually enhances organizational outcomes (He and Wong, 2004; Lee *et al*., 2015). In this study, we connect these capabilities with three outcome dimensions: (1) market capitalizing, which embodies pro-active implementation of internal changes needed to create new offerings to capitalize on emerging market opportunities; (2) operational adjustment, which denotes quick reconfiguration of business routines reacting to demand changes or other stimuli (Lin *et al*., 2020; Lu and Ramamurthy, 2011; Panda, 2022); and, (3) competitive performance, which reflects the degree to which an organization performs better than its competitors during the crises (Rai and Tang, 2010).

While ambidexterity is widely regarded as a superior strategic approach, most supporting evidence comes from stable environments or "normal times", where organizations have the structural and temporal flexibility to manage exploration and exploitation simultaneously (Gibson and Birkinshaw, 2004; He and Wong, 2004; Jansen *et al*., 2012). Recent studies have begun to support the effectiveness of ambidexterity in crisis contexts as well (Bechthold *et al*., 2021; Dolz *et al*., 2020; Iborra *et al*., 2020), yet its universal applicability remains contested (Chakma *et al*., 2024; Clauss *et al*., 2021). Indeed, exploration, exploitation and ambidexterity strategies are largely context-dependent and time-dependent; thus, it is problematic confining them into a one-size-fits-all solution (Cao *et al*., 2009). This view is supported by empirical studies in contexts of discontinuous change or competitive turbulence suggesting that either exploration or exploitation alone may outperform ambidexterity (Jansen *et al*., 2006; Luger *et al*., 2018). So far, it remains unclear which approach performs best as prior studies conducted in crisis contexts have barely examined exploration, exploitation, and ambidexterity strategies in direct comparison. This gap calls for clearer, evidenced-based guidance.

Consequently, we pursue the following research questions: (1) How is organizational alertness related with IT exploration, IT exploitation, and IT ambidexterity strategies during crises? (2) To what extent are these IT-enabled strategies related with competitive performance in crisis conditions? (3) Does the simultaneous pursuit of IT exploration and IT exploitation (i.e. IT ambidexterity) weaken or strengthen adaptation outcomes compared to singular strategic focuses? We propose and empirically test a model where alertness enables

organizations to align IT exploration with swift market capitalizing (exploration strategy) and IT exploitation with swift operational adjustment (exploitation strategy). This research contributes to ambidexterity theory by disentangling the individual and joint effects of IT-enabled exploration and exploitation strategies in times of crisis. It challenges assumptions of universal benefits of ambidexterity and prior work favoring internally driven contextual ambidexterity, by introducing environmentally contingent ambidexterity, which highlights environmental and capability-based contingencies related to the effectiveness of crisis responses. Further, we demonstrate the short-term implications of exploratory, exploitative and ambidexterity strategies, and establish organizational alertness as the foundation that enables timely and context-sensitive deployment of IT-enabled crisis responses.

2. Theoretical background

2.1 Ambidexterity theory for crisis response

The framing of this study builds on ambidexterity theory, which propounds the broadly accepted thesis that organizations must balance exploration and exploitation strategies to survive and create competitive advantage (March, 1991). *Exploration strategies* focus on creating radical change and pursuing proactive innovations, enabling organizations to seize new market opportunities (Lee *et al*., 2015). They are outward-looking, market-oriented actions that foster growth and long-term prosperity. *Exploitation strategies*, in contrast, prioritize incremental adjustments and operational efficiency (He and Wong, 2004). They are inward-looking, emphasizing cost reduction and process improvements that aid short-term wins. *Ambidexterity strategies* combine elements of both exploration and exploitation, enabling organizations to simultaneously pursue innovation and optimization, supporting both long-term and short-term goals. Prior research has highlighted various mechanisms to balance exploration-exploitation, such as through temporal (Siggelkow and Levinthal, 2003), structural (O'Reilly and Tushman, 2004), or contextual approaches (Birkinshaw and Gibson, 2004; Hansen *et al*., 2018). Structural ambidexterity relies on formal (exploration-exploitation) unit separation, temporal ambidexterity applies (exploration-exploitation) alternations over time, while contextual ambidexterity refers to the internal organizational systems that enable individuals to decide how to use their time between exploration-exploitation (Gibson and Birkinshaw, 2004). To complement these previously established approaches, this study examines ambidextrous responses in light of external crisis conditions. We adopt a more contingent view of ambidexterity, where firms may benefit from distinct strategies, either on ambidexterity, exploration or exploitation, depending on the specific demands of the crisis. We refer to this approach as environmentally contingent ambidexterity.

There is a wide consensus in the literature that organizations successfully managing ambidexterity outperform those that pursue one-sided exploration or exploitation. However, this was mainly connected to a rather static balance model of ambidexterity, which has been researched mostly in normal times, and where organizations have the structural or temporal flexibility to manage the tension between the two modes (Raisch *et al*., 2009). Crises present an abrupt break from normalcy, typically characterized by low preparedness, resource scarcity, high uncertainty, and urgency to act (Clauss *et al*., 2022). Under these conditions, there is an amplified tension between exploration and exploitation (Salamzadeh and Dana, 2022), forcing organizations to prioritize one mode over the other, distorting the balance (Osiyevskyy *et al*., 2020). Notably, the Covid-19 crisis imposed the suspension of physical interactions worldwide (with a few exceptions), pressuring companies to react quickly to customer changing needs. Some companies act risk-averse and prioritize exploitation (Wenzel *et al*., 2020), which may offer short-term stability, at the expense of missing emerging opportunities. Others prioritize exploration through business model pivots (Sanasi and Ghezzi, 2022) or new digital investments at the risk of not implementing these changes timely (Gkeredakis *et al*., 2021). Thus, these one-sided tendencies can result in suboptimal crisis responses.

Prior research indicates that there is no one-size-fits-all solution for applying ambidexterity in crisis. For instance, Osiyevskyy *et al*. (2020), studying Russian SMEs during the 2014–2016 economic crisis, found that, on the short-term, exploration tends to improve performance but introduces instability, whereas exploitation offers greater stability at the cost of reduced performance. Similarly, Doblinger *et al*. (2022) observed a U-shaped relationship between ambidexterity and performance stability among German firms during the 2008 financial crisis. In contrast, Smara *et al*. (2022) showed that ambidexterity simultaneously boosts performance and reduces variability for Russian SMEs during the Covid-19 crisis. Chou *et al*. (2024) added a longer-term perspective, showing that exploitation generally drives post-crisis performance, especially in non-tech sectors, while ambidexterity only outperforms in high-tech environments. These findings reflect the need to question the effectiveness of ambidexterity during a crisis, which appears to be not universal, but rather contingent and potentially time-bound.

Taken together, this study relies on the assumption that organizations in crisis must shift their focus from renowned mechanisms that sustain long-term advantages to rapid strategic actions that enable short-term benefits and temporary advantages (Huang *et al*., 2015; Salamzadeh and Dana, 2022). Information technology (IT) has emerged as a critical enabler of such strategic actions (Liang *et al*., 2022). For example, during the Covid-19 pandemic, many organizations explored IT tools such as Microsoft Teams and Zoom to rapidly switch to new forms of work (i.e. remote) (Benitez *et al*., 2023). Other organizations utilized existing IT systems such as enterprise resource planning (ERP) and customer relationship management (CRM) tools to monitor inventory levels, manage customer interactions, and automate routine processes, ensuring stability during disruptions (Liang *et al*., 2022). Still others sought IT-enabled ambidexterity by balancing digital exploration (e.g. reprogramming machinery and launching video-commerce to access new B2C markets) with exploitation of their existing production planning and CRM systems to fulfill both existing and emerging customer orders (Bettiol *et al*., 2023). Having outlined the crucial role of IT in enabling strategic responses, the following section recognizes alertness as a foundation for enacting IT-enabled strategies and their contribution to crisis response outcomes, such as market capitalizing, operational adjustment and competitive performance.

2.2 Organizational alertness as a strategy-enabling capability

Organizational alertness is a critical capability for navigating crises through shaping the effectiveness of exploration, exploitation, and ambidexterity response strategies. It acts as a precursor to strategic action by enabling organizations to sense changes in the environment, interpret their implications, and align their IT capabilities with the demands of the crisis (Järveläinen, 2013). Alertness encompasses several core sensing and seizing activities, traditionally also considering in risk and business continuity management. First, it includes the regular conduction of business-impact analyses for diverse risk scenarios, ensuring organizations are aptly prepared (Torabi *et al*., 2014). Second, it involves recognizing the interdependencies among software applications, ensuring that IT infrastructures are resilient during crises (Li *et al*., 2022). Third, it extends to enforcing stringent business continuity standards among suppliers, reflecting the broader commitment to alertness (Faertes, 2015). Fourth, it ensures that alertness measures are not just ancillary tools, but are central to the development and delivery of new products or services (Herbane *et al*., 2004). These activities should be performed regularly for an organization to be alert against changing environmental contingencies (Herbane *et al*., 2004). In the context of IT capabilities, alertness serves as a foundation for both exploration and exploitation. For IT exploration, alertness enables organizations to identify emerging market trends and leverage analytics or AI tools to capitalize on new opportunities. For IT exploitation, alertness ensures that existing systems are optimized to address immediate operational challenges. Furthermore, in ambidexterity strategies, alertness facilitates the dynamic allocation of resources between exploration and exploitation, ensuring that both short-term and long-term objectives are met.

2.3 Crisis response outcomes

The ultimate goal of exploration, exploitation, and ambidexterity strategies in response to a crisis is to achieve competitive performance in order to outperform its competitors in terms of profitability, market share, and growth (Rai and Tang, 2010). In crises, competitive performance depends on an organization's ability to adapt swiftly and effectively to changing conditions, and leverage its IT capabilities to create temporary advantages. Two outcome dimensions are particularly relevant in crisis contexts: swift market capitalizing and swift operational adjustment. The former tends to reflect proactive actions that seize emerging opportunities, while the later is shaped by immediate responses that ensure continuity and resilience (Mao *et al*., 2021; Panda, 2022). Market capitalizing contains an external, market-oriented focus, where organizations actively seek and capitalize on prospective gains (Lu and Ramamurthy, 2011). In contrast, swift operational adjustment signifies an internal focus on operational responsiveness, emphasizing swift adaptations to uncertain and evolving external circumstances (Lee *et al*., 2003). Recent findings suggest that such adaptations can reveal an organization's potential and also generate long-term positive effects (Clauss *et al*., 2022), thereby ultimately translating into sustainable competitive advantage (Huang *et al*., 2015).

3. Hypotheses development

Figure 1 presents our research model, positioning organizational alertness as a foundation for IT enabled *exploration, exploitation* and *ambidexterity* crises response strategies, which in turn contribute to competitive performance. This framing reflects the pivotal role of organizational alertness in identifying internal and external threats, and enabling organizations to swiftly adapt and reconfigure resources in response to changes required (Järveläinen, 2013). The following sub-sections further develop and describe the elements of this model.

3.1 Organizational alertness

In crisis contexts, organizations can engage in both swift market capitalizing to proactively seize emergent opportunities and swift operational adjustment to more reactively ensuring continuity opportunities (Mao *et al*., 2021; Panda, 2022). We argue that the effectiveness of these adaptations depends on an organization's ability to swiftly sense changes, assess risks, and respond accordingly. Organizational alertness capability represents such a sensing capability, enabling organizations to recognize threats and opportunities, manage critical resource interdependencies, and reconfigure operations as needed (Swartz *et al*., 2003). While research has established that sensing capabilities contribute to strategic adaptation (Teece *et al*., 2016), the direct link between organizational alertness and these two distinct crisis response strategies remains underexplored.

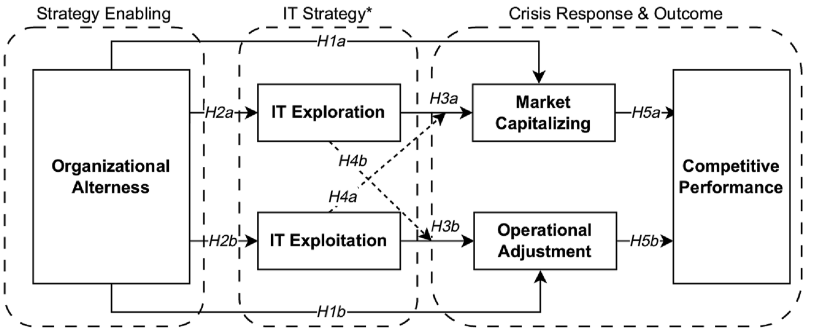

Figure 1. Basic research model. Note: *The dotted lines (in H4a and H4b) represent the interaction effects of IT Exploration and IT Exploitation, which are considered as IT Ambidexterity. Source: Authors' own work

Prior studies highlight the role of alertness in identifying and leveraging emerging opportunities. Organization with strong alertness capabilities can quickly recognize shifts in demand, consumer behavior, or market gaps, allowing them to adapt products, services, or business models accordingly. Evidence from SMEs demonstrates that CEO alertness significantly accelerates new product introductions, which is closely related with market capitalizing (Srivastavaa *et al*., 2020). Similarly, research on Taiwanese SMEs finds that entrepreneurial alertness enhances innovation, which in turn improves financial performance (Tang *et al*., 2023). More broadly, organizations with higher entrepreneurial alertness are better positioned to discover and capitalize on new opportunities (Pinheiro *et al*., 2024). Given that market capitalizing reflects a market-oriented, opportunity-driven approach (Lu and Ramamurthy, 2011), it is reasonable to expect that organizational alertness enhances this capability. Thus, we hypothesize:

H1a. Organizational alertness is positively associated with swift market capitalizing during a crisis.

Apart from swift market capitalizing, organizations facing crises must also ensure operational continuity and rapidly reconfigure internal processes (Bajgoric and Moon, 2009; Shrivastava *et al*., 2021). Organizational alertness is likely to facilitate this by enhancing real-time monitoring, decision-making, and process adaptation from a business continuity perspective (Bakar *et al*., 2015). Prior research shows that organizations with higher alertness capabilities can anticipate disruptions and execute operational adjustments more effectively, which contributes to stability and resilience (Torabi *et al*., 2014). Further empirical evidence indicates that alert organizations with superior preparedness capabilities are better equipped to adapt operations swiftly (Bajgorić *et al*., 2022). Consequently, we propose:

H1b. Organizational alertness is positively associated with swift operational adjustment during a crisis.

Given that organizational alertness involves recognizing potential threats and creating safeguards to ensure the continuous delivery of products and services (Tang *et al*., 2023), it is reasonable to argue that it supports IT capabilities, which today in most cases provide the backbone of these products and services (Wiesböck *et al*., 2020). For instance, past studies emphasized the critical role of integrating organizational alertness with IT capabilities in developing critical warning systems, which significantly improve early detection and mitigation of various crises (Arru *et al*., 2019). Further, recent empirical evidence supports the idea that organizations with heightened preparedness capabilities (which are analogous to alertness capabilities) are better equipped to develop advanced IT capabilities (Bajgorić *et al*., 2022). Along these lines, Song *et al*. (2008) suggest that market-linking and sensing capabilities (which are also comparable with alertness capabilities) positively affect IT capabilities used for sensing new market trends (exploration) and improving product development operations (exploitation). Consequently, we hypothesize that:

H2(a-b). Organizational alertness is positively associated with (a) IT exploration and (b) IT exploitation during a crisis.

3.2 IT exploration, exploitation, and ambidexterity

The distinctive roles of exploration and exploitation for organizational change effectiveness have long been discussed in organization theory and management literature (He and Wong, 2004). This discussion nowadays needs to be firmly intertwined with IT as it has become the basis for contemporary organizations to compete in the era of digitalization. Indeed, IT capabilities are considered essential backbones not only to support the business but also to provide operational excellence and innovation as envisioned (Lee *et al*., 2004). More recently, IT capabilities have been strongly linked with learning theories, such as absorptive capacity

(Limaj *et al*., 2016; Zahra and George, 2002). For example, they support a high-level internalization of external knowledge (Ravichandran, 2018) or improving process and product innovation (Nambisan, 2002). More specifically, in terms of IT exploration, there is evidence showing that organizations incorporating new information and communication technologies achieve better results in managing changing customer demands (Nambisan, 2002). In this vein, other studies show that organizations pursuing IT exploration cope better with external changes as they create a higher ability to sense IT disruptions and yield superior outcomes from market opportunities (Ravichandran, 2018). Based on this reasoning, we formulate the hypothesis:

H3a. IT exploration is positively associated with swift market capitalizing during a crisis.

Further, IT exploitation assists the rearrangement, integration and alignment of IT resources with business processes to improve outcomes in understanding and reacting to external changes (Gregory *et al*., 2015; Zhou *et al*., 2018). The improvement of IT infrastructure and IT skills influences organization results in strengthening i.a. process and performance management effectiveness (Mithas *et al*., 2011). This view is consistent with a recent study showing that organizations pursuing IT exploitation achieve higher coordination and make quicker and more effective decisions in the face of external changes (Zhen *et al*., 2021). Therefore, we are led to posit:

H3b. IT exploitation is positively associated with swift operational adjustment during a crisis.

In stable or moderately dynamic environments, ambidexterity is often associated with improved organizational outcomes (e.g. Gregory *et al*., 2015; He and Wong, 2004). From this view, IT ambidexterity could strengthen the relationship between IT exploration and market capitalizing (captured by H3a), as well as between IT exploitation and operational adjustment (H3b), by providing synergies between innovation and efficiency. However, during a severe crisis, where organizations often face limited time, reduced resources, and heightened uncertainty, the dual demands of ambidexterity may amplify the reported tensions from balancing both strategies (Chakma *et al*., 2024; Clauss *et al*., 2021) and thereby hinder swift responses. Alternatively utilizing ambidexterity by temporally separating IT exploitation and exploration, as for example suggested by Liang *et al*. (2022) and O'Reilly and Tushman (2013), does not seem viable given the narrow time frame for making swift changes during a crisis. In the crisis context, ambidexterity may not add additional value to exploration and exploitation as distinct strategies (Osiyevskyy *et al*., 2020). Simultaneously pursuing IT exploration and IT exploitation may dilute the organizational focus and stretch critical resources thin, especially if either capability is underdeveloped. We thus assume the following:

H4(a-b). IT ambidexterity negatively moderates the relationship between (a) IT exploration and swift market capitalizing, and (b) IT exploitation and swift operational adjustments during a crisis.

3.3 Operational adjustment and market capitalizing

Prior research has established increasing significance of swift operational adjustment and swift market capitalizing for performance-related outcomes. For instance, a study conducted among agricultural firms in China found that market capitalizing creates financial performance gains, while operational adjustment creates nonfinancial performance gains (Li *et al*., 2020). Another study showed that organizations with high levels of agility in terms of market capitalizing and operational adjustment were linked with enhanced operational and financial performance (Liu *et al*., 2014). Further, a survey conducted during the COVID-19 pandemic indicated that high market capitalizing helped a third of respondents to increase their business growth (Kettunen *et al*., 2021). On the other hand, efficient operational adjustment

not only mitigates immediate operational risks but also positions organizations for competitive advantage by ensuring reliability and responsiveness (Swartz *et al*., 2003). This is further corroborated by prior research using capability-building hierarchies translating positive effects of IT capabilities into enhanced competitive performance (Queiroz *et al*., 2018), with operational adjustment and market capitalizing acting as mediators (Liu *et al*., 2014; Panda, 2022). In light of these considerations, we put forward the supposition that:

H5(a-b). Swift market capitalizing (a) and swift operational adjustment (b) are positively associated with competitive performance during a crisis.

4. Research design and execution

4.1 Sample and data collection

Our study focused on organizations in Austria, Germany and Switzerland, from which we identified 3,144 executives and managers holding MBAs or affiliated with executive academies, using LinkedIn, XING, and alumni databases from three universities. High-level managers were selected as reliable informants due to their role as primary decision-makers familiar with strategic processes and outcomes (Huber and Power, 1985). The data was collected in the timeframe from July to November 2020 and facilitated via an online survey tool compliant with the General Data Protection Regulation (GDPR) of the EU (EC, 2016), supported by follow-up calls, reminder emails, and incentives like a survey report and online findings presentation. After exclusion of two outliers, 166 valid responses were retained for the study, exceeding benchmarks based on the inverse square root method, gamma-exponential method, as well as the "ten times rule" method and minimum R-squared method (Hair *et al*., 2022).

4.2 Measurements

Following recommendations for the scale development process (MacKenzie *et al*., 2011), we first started with construct conceptualizations using definitions from the extant literature, which we applied to the crisis context. Accordingly, based on the work of Järveläinen (2013), we define *organizational alertness* as an organization's ability to recognize threats and effectively orchestrate resources for prevention and protect business continuity. Further, we draw on the works of Atuahene-Gima (2005), Lee *et al*. (2015), Nambisan *et al*. (1999), Ravichandran *et al*. (2005) to define *IT exploration* as organization's ability to acquire and experiment with new IT resources and practices, and *IT exploitation* as organization's ability to utilize existing IT resources and practices. Similarly, based on the contribution of Lee *et al*. (2015), we conceptualize IT ambidexterity as organization's ability to engage simultaneously in both IT exploration and IT exploitation. Following the efforts of Lu and Ramamurthy (2011), Panda (2022) to capture agility outcomes, we focus on change outcomes and define *swift market capitalizing* as the organization's pro-active implementation of internal changes needed to create new offerings to capitalize on emerging market opportunities, and *swift operational adjustment* as the organization's quick reconfiguration of business routines reacting to demand changes or other stimuli. Finally, grounded in the research of (Rai and Tang, 2010), we define competitive performance as the degree to which an organization performs better than its competitors during the crises.

The measurement items of all main constructs are presented in the supplementary material (Supplementary_material_appendix_A, Table A1), which were assessed by means of seven-point Likert scales. Control variables were selected based on their theoretical relevance to IT-enabled strategic responses, capturing variations in IT capacity and maturity that may shape crisis adaptation. They were measured by single-items and included (1) *IT spending* compared to key competitors, (2) the percentage of full-time equivalent employees *working in IT* roles, and (3) *organizational age*. In term of IT Ambidexterity used in the moderation analysis only,

we assess it through the interaction effect formed as the product term of IT exploration and IT exploitation, in line also with previous studies (e.g. Gupta *et al*., 2006; Zhang *et al*., 2017). This approach assumes that IT exploration and IT exploitation are independent dimensions, with their effects interdependent (Rosing and Zacher, 2017).

4.3 Instrument validity and pre-testing

To assess content validity and engage in scale refinements (MacKenzie *et al*., 2011), we conducted two rounds of pre-testing with academics and IT managers (i.e. nine people in total), but their responses were not included in the data analysis. This process allowed us to conduct an assessment of the measurement instrument from multiple perspectives, which enabled us to explore nuanced variations in wording. Additionally, we ensured the reliability and validity of the measurement model through appropriate validation procedures outlined in the next section. The survey questionnaire was developed and applied in the English language.

4.4 Estimation strategy

We applied partial least squares (PLS) structural equation modeling to test the research hypotheses, which is an effective and robust analytical tool given our model complexity, supporting also our extended analysis including meditation and moderation (Benitez *et al*., 2020; Hair *et al*., 2024). PLS applies a single-step variance-based approach to "*examine the relationships between multi-item latent variables*", aligning with both research design and model characteristics (Manley *et al*., 2021, p. 1808), and matches the characteristics of the variables in this study. Bootstrapping with 5,000 subsamples was used to determine significant levels of weights, loadings, and path coefficients.

5. Results

5.1 Sample demographics

The demographic characteristics of the sample are summarized in Table 1. These include age and gender, of the respondent, and the industry, age and size of the associated organization reflected by full time equivalent (FTE) employees. Respondents were mostly experienced and senior employees in executive or management positions. The majority of respondents belong to large organizations (according to EU guidelines) having more than 250 FTEs (60.4%) and with substantial operational maturity (over 11 years: 86.5%). These organizations were primarily active in manufacturing, information and communication, and financial and insurance sectors, together representing 68.6% of the sample. These characteristics align well with the study's focus on IT-enabled strategic responses in mature, digitally active organizations.

5.2 Nonresponse bias

To examine the possibility of survey *nonresponse bias*, we used the commonly applied wave analysis (Van der Stede *et al*., 2006). For this purpose, we used a split-sample approach, where one sub-sample represented early respondents, the other late respondents according to the response time, which the survey tool automatically registered. To integrate responses across different channels not initiated concurrently, we classified respondents of each applicable sub-sample separately and then pooled the sub-samples again. The demographic comparisons between early and late respondents revealed no significantly different characteristics considered in terms of the respondents' gender (χ^2 test, $p = 0.81$), job role (χ^2 test, $p = 0.81$) and mean age (two-sample unpaired *t*-test, $p = 0.90$), as well as in terms of organization-level characteristics covering industry (χ^2 test, $p = 0.36$), organizational age (χ^2 test, $p = 0.37$), number of fulltime equivalent employees (two-sample unpaired *t*-test, $p = 0.53$) and share of fulltime equivalent IT employees (two-sample unpaired *t*-test, $p = 0.56$). Thus, we see no evidence for survey nonresponse bias.

Table 1. Sample characteristics

Variable	Category	#	%
Age of respondents (years)	20–30	17	10.2
	31–40	46	27.7
	41–50	56	33.8
	>50	47	28.3
Gender of respondents	Male	133	82.1
	Female	29	17.9
	Missing	4	
Organization age (years)	0–2	3	1.8
	3–10	19	11.7
	11–50	77	47.2
	>51	64	39.3
	Missing	3	
Organization size (FTE employees)	<10	12	7.3
	10–49	18	11.0
	50–249	35	21.3
	>250	99	60.4
	Missing	2	
Organization industry (NAICS Rev. 2)	Manufacturing (C)	48	30.8
	Information and communication (J)	42	26.9
	Financial and insurance activities (K)	17	10.9
	Administrative and support service activities (N)	13	8.3
	Electricity, gas, steam and air conditioning (D)	10	6.4
	Transportation and storage (H)	7	4.5
	Wholesale and retail trade (G)	5	3.2
	Other sections	14	9.0
	Missing	10	

Note(s): # number of respondents
Source(s): Authors' own work

5.3 Common method variance

Given the limitations of traditional approaches, particularly regarding large sample requirements, model complexity, and distributional assumption (Gudergan *et al.*, 2025; Hair *et al.*, 2022), we applied two complementary techniques specifically suited for PLS-SEM to test for common method variance (CMV) (Malhotra *et al.*, 2006): the measured latent marker variable (MLMV) approach (Chin *et al.*, 2013) and the collinearity-based assessment (Kock, 2015). Neither of the applied tests suggest a threat of CMV.

For the MLMV approach, we included a theoretically unrelated marker variable (respondent age) in our model (Chin *et al.*, 2013). A comparison of the estimated path model relationships with and without this additional marker variable showed no notable differences. All theorized pathways maintained their levels of significance, suggesting minimal CMB.

For the variance inflation factors (VIFs) collinearity approach, we used a random dependent variable to test for CMV (Kock and Lynn, 2012, p. 578) and were concerned with CMV implied by collinearity between factors (Kock, 2015). For this purpose, we created a new model where all of the latent variables were connected to a latent construct with a single-indicator random variable. All of the "inner model" VIFs are between 1.0 and 2.5, therefore well below the indicated threshold (3.3) confirming that collinearity-driven CMV is unlikely.

5.4 Measurement model evaluation

Considering that the measurement model is composed of reflective constructs only, we assessed indicator reliability, convergent reliability, internal consistency reliability, and

discriminant validity according to current guidelines (Benitez *et al*., 2020; Hair *et al*., 2022; Manley *et al*., 2021). The results in Table 2 show that standardized outer loadings are all statistically significant (i.e. > 0.708) and all latent variable explain at least 50% of an indicator's variance (assessed through the square of standardized indicator's outer loading), hence assuring indicator reliability. Similarly, convergent validity on the construct level is established as all values of the average variance extracted (AVE) are above the 0.5 threshold. To evaluate internal consistency reliability, we considered three measures: Cronbach's alpha (Cronbach, 1951), composite reliability p_c (Chin, 2010), and the more recent Dijkstra-Henseler's rho pA (Dijkstra and Henseler, 2015). As a rule of thumb, these measures vary from 0 to 1, with higher values indicating better reliability (Manley *et al*., 2021). The values of all three measures are way above the 0.7 threshold, indicating highly satisfactory level of internal consistency reliability.

In terms of discriminant validity, we followed the heterotrait-monotrait (HTMT) ratio of correlations approach, which is currently recommended in assessing discriminant validity over conventional methods like the Fornell-Larcker criterion (Benitez *et al*., 2020). The criteria have been satisfied (see Table 3), suggesting a good discriminant validity of the constructs. The HTMT correlation between market capitalizing and operational adjustment is slightly above, but still well below 0.90, which is the threshold for conceptually similar constructs (Hair *et al*., 2022, p. 123). We also applied the bootstrapping procedure showing that the upper bound of the HTMT value's 95% one-sided confidence interval were all below 0.85. The results suggest good measurement properties, allowing us to proceed with hypotheses testing.

To assess the robustness of our results, we conducted a series of complementary analyses, including cross-estimator validation (PROCESS vs PLS-SEM) and three theory-driven alternative model specifications. The results of these analyses are reported in the supplementary material (Supplementary_material_appendix_B). These tests addressed

Table 2. Indicator reliability, convergent validity and internal consistency reliability

Construct	Items	Loadings	Indicator reliability (loadings^2)	AVE	Cronbach's alpha	rho pA	Composite reliability p_c
Organizational Alertness	OAC1	0.85	0.72	0.72	0.87	0.87	0.91
	OAC2	0.80	0.64				
	OAC3	0.89	0.79				
	OAC4	0.85	0.72				
IT Exploration	ITEXPR1	0.91	0.83	0.85	0.91	0.91	0.94
	ITEXPR2	0.94	0.88				
	ITEXPR3	0.91	0.83				
IT Exploitation	ITEXPL1	0.87	0.76	0.79	0.87	0.88	0.92
	ITEXPL2	0.93	0.86				
	ITEXPL3	0.87	0.76				
Market Capitalizing	MCAP1	0.88	0.77	0.82	0.89	0.89	0.93
	MCAP2	0.93	0.86				
	MCAP3	0.91	0.83				
Operational Adjustment	OADJ1	0.90	0.81	0.82	0.89	0.89	0.93
	OADJ2	0.91	0.83				
	OADJ3	0.91	0.83				
Competitive Performance	COMP1	0.87	0.76	0.72	0.88	0.92	0.91
	COMP2	0.76	0.58				
	COMP3	0.87	0.76				
	COMP4	0.90	0.81				

Note(s): Loadings > 0.708, Loadings^2 > 0.5; AVE > 0.5; Cronbach's α, pc, or rho pA > 0.7

Source(s): Authors' own work

Table 3. HTMT analysis

	Organizational alertness	IT exploration	IT exploitation	Market capitalizing	Operational adjustment
IT Exploration	0.61				
IT Exploitation	0.45	0.58			
Market Capitalizing	0.61	0.59	0.48		
Operational Adjustment	0.61	0.51	0.52	0.86	
Competitive Performance	0.41	0.40	0.35	0.36	0.31

Note(s): The HTMT values are all <0.85 (or 0.90)
Source(s): Authors' own work

potential concerns related to the estimation method, reverse causality, omitted-variable bias, and outcome specificity. Across all tests, the original model's structure and key path relationships remained stable and theoretically coherent, strengthening confidence in the validity of the results.

5.5 Structural model assessment

As illustrated in Figure 2, our model explains 30% of the variance in IT exploration, 16% of the variance in IT exploitation, 39% of the variance in market capitalizing, and 38% of the variance in operational adjustment. This values thus demonstrate a good explanatory power of the proposed research model. The variance explained in competitive performance is lower (10%), which, however, is still common for this type of dependent variable that is dependent on many other variables.

Next, we assessed the model's predictive power by running the PLS Predict procedure using ten folds and ten repetitions as suggested in Sarstedt *et al*. (2021, pp. 36–37). We had to choose one of the model's key endogenous constructs (Hair *et al*., 2022, p. 202) and focused on operational adjustment and its three indicators. The results presented in Table 4 show that $Q^2_{predict}$ values of the PLS model are positive for all indicators, indicating that the model has predictive relevance and outperforms the naïve linear model (LM) benchmark. This is further supported by consistently lower RMSE values for the PLS model compared to LM.

We undertook a secondary (more advanced) evaluation of predictive modeling using the recent cross-validated predictive ability test (CVPAT) on the overall model, as delineated by

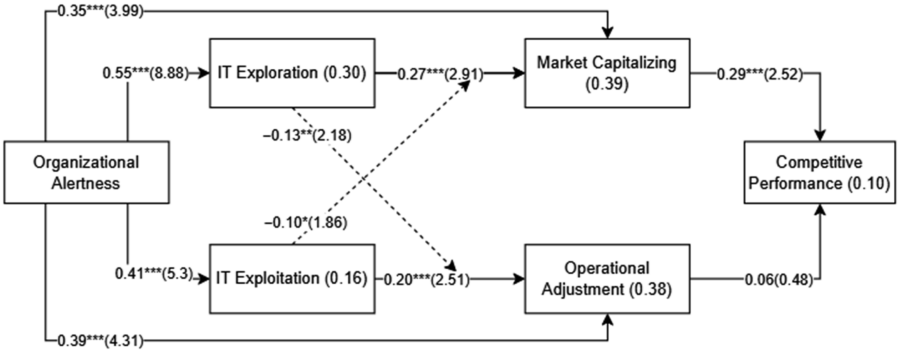

Figure 2. Structural model results with moderation effects. Note: construct ($R^2_{adjusted}$); path ß (*t* values); ***$p < 0.01$, **$p < 0.05$, *$p < 0.10$. Source: Authors' own work

Table 4. Results of PLS predict

	$Q^2_{predict}$	PLS-SEM_RMSE	LM_RMSE	PLS-LM
OADJ1	0.22	1.54	1.57	−0,03
OADJ2	0.26	1.53	1.56	−0,03
OADJ3	0.21	1.50	1.53	−0,03

Source(s): Authors' own work

Sharma *et al*. (2023) considering that the superior model is the one with lower loss. The results in Table 5 show that predictions derived from PLS significantly surpass the traditional naïve indictor average (IA) benchmark across all endogenous constructs.

To assess collinearity, we reviewed the inner VIF values (see Table 6) combining endogenous variables with the related exogenous variables, which are clearly below the stricter threshold of 3.0 (Hair *et al*., 2022). Hence, we conclude that collinearity is not an issue in the structural model.

Finally, we tested the research hypotheses by examining the size and statistical significance of the path coefficients (β). We also report effect sizes (f^2) where values beyond 0.02, 0.15, and 0.35 indicate small, medium and large effect sizes, respectively. In terms of RQ1, the results show that organizational alertness has a small positive effect on market capitalizing ($\beta = 0.35$, $p < 0.01$) and operational adjustment ($\beta = 0.39$, $p < 0.01$), supporting H1a and H1b.

Table 5. Results of CVPAT – PLS vs Indicator average (IA)

	PLS loss	IA loss	Average loss difference	*t*-value	*p* value
Competitive Performance	2.05	2.21	−0.16	3.36	0.00
IT Exploitation	1.85	2.09	−0.24	2.14	0.03
IT Exploration	2.26	2.97	−0.71	3.51	0.00
Market Capitalizing	2.39	3.12	−0.73	3.48	0.00
Operational Adjustments	2.32	3.01	−0.68	2.96	0.00
Overall	2.17	2.65	−0.48	4.28	0.00

Source(s): Authors' own work

Table 6. Inner VIF values

Hypothesis	Path	VIF
H1a	Organizational Alertness→ Market Capitalizing	1.49
H1b	Organizational Alertness→ Operational Adjustments	1.49
H2a	Organizational Alertness→ IT Exploration	1.00
H2b	Organizational Alertness→ IT Exploitation	1.00
H3a	IT Exploration → Market Capitalizing	1.69
H3b	IT Exploitation → Operational Adjustments	1.51
H4a	IT Ambidexterity → Market Capitalizing	1.08
H4b	IT Ambidexterity → Operational Adjustments	1.08
H5a	Market Capitalizing → Competitive Performance	1.08
H5b	Operational Adjustments → Competitive Performance	1.08

Source(s): Authors' own work

Additionally, organizational alertness has a large positive effect on IT exploration ($\beta = 0.55$, $p < 0.01$) and a medium positive effect on IT exploitation ($\beta = 0.41$, $p < 0.01$), supporting hypothesis H2a and H2b. In terms of RQ2, IT exploration has small positive effects on market capitalizing ($\beta = 0.27$, $p < 0.01$), supporting H3a; and similarly, IT exploitation has a small positive effect on operational adjustments ($\beta = 0.20$, $p < 0.01$), supporting H3b. Finally, market capitalizing has a small positive effect on competitive performance ($\beta = 0.29$, $p < 0.01$), supporting H5a. In short, the results support all hypotheses except H5b.

5.6 Moderation test

To answer RQ3, we first examined whether IT exploitation moderates the relationship between IT exploration and swift market capitalizing (H4a). Second, we considered whether IT exploration moderates the relationship between IT exploitation and swift operational adjustment (H4b). Using the two-stage approach with standardized data (Hair *et al.*, 2022, p. 253), we created the interaction term representing IT ambidexterity. VIF values, as reported in Table 6, again confirmed that collinearity was not an issue. Structural and measurement model assessments also met all relevant criteria. The results show that IT exploitation significantly weakens the positive relationship between IT exploration and swift market capitalizing ($\beta = -0.10$, $p < 0.10$), while IT exploration similarly weakens the effect of IT exploitation on operational adjustment ($\beta = -0.13$, $p < 0.05$), thereby confirming H4a and H4b.

We also conducted an interaction slope analysis to better understand these relationships. The two lines in Figure 3 represent the relationships at high and low levels of the moderator (Hair *et al.*, 2021, p. 169). As illustrated in the left chart, IT exploitation moderates the relationship between IT exploration and swift market capitalizing. The slopes indicate that while higher IT exploration is associated with increased market capitalizing, this effect is more pronounced under conditions of low IT exploitation. However, as IT exploitation increases, the difference in slopes diminishes, indicating a differential enhancement effect rather than a reversal. Similarly, in the right chart, IT exploration moderates the relationship between IT exploitation and swift operational adjustment. These results suggest that while IT exploitation positively influences operational adjustment, this effect is stronger under low IT exploration and weakens as IT exploration increases. This pattern implies that IT exploration and IT exploitation interact dynamically, where high levels of one can reduce the incremental benefits of the other.

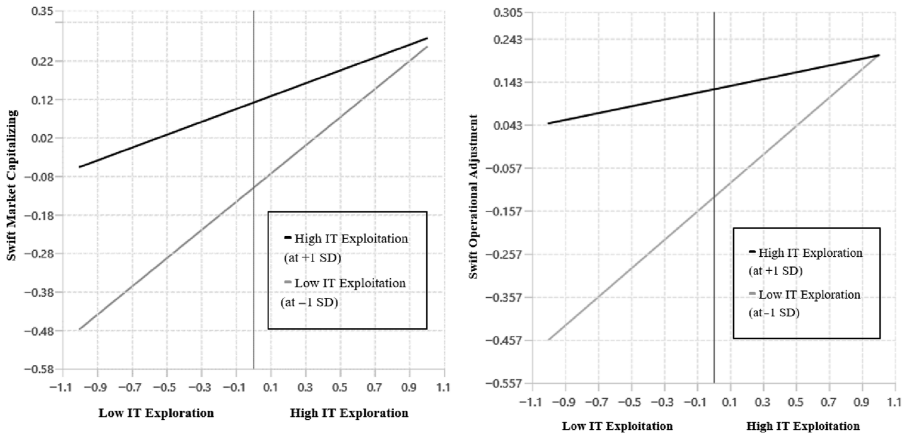

Figure 3. The moderation interaction plots. Source: Authors' own work

5.7 Post-hoc multiple mediation testing

We conducted a mediation analysis post-hoc to uncover additional indirect effects beyond the initial hypotheses, enabling data-driven insights while maintaining the original model's focus and parsimony. Considering our model setup, we followed current recommendation for multiple mediation testing offered by Hair *et al*. (2022, pp. 228–243) and bootstrapped the sampling distribution of the indirect effect. We detected only two significant complementary mediations (see Table 7). First, IT exploration (partially) mediates the effects of organizational alertness on market capitalizing, as the indirect effect ($\beta = 0.15$, $p < 0.01$) and the direct effect ($\beta = 0.33$, $p < 0.01$) are both significant and point in the same direction. Second, IT exploitation (partially) mediates the effects of organizational alertness on operational adjustment as the indirect effect ($\beta = 0.10$, $p < 0.05$) and the direct effect ($\beta = 0.37$, $p < 0.01$) are both significant and point in the same direction.

6. Discussion and conclusion

The roles of exploration, exploitation, and ambidexterity strategies have been central to business and IS scholarship (Güttel and Konlechner, 2023). While prior research acknowledges the importance of alertness and IT capabilities in shaping these strategies (e.g. Bajgorić *et al*., 2022; Benitez *et al*., 2023), how these capabilities are associated with competitive performance in crises remains underexplored. The results of this study provide a nuanced understanding of this matter. In response to the first research question, regarding how organizational alertness is linked to IT-enabled capabilities during crisis, our findings show that alertness positively relates to both IT exploration and IT exploitation, revealing distinct pathways: IT exploration partially channels alertness into externally focused responses (through market capitalizing), while IT exploitation partially mediates alertness into internal adaptation (through operational adjustment). In terms of the second question regarding linkages between IT-enabled strategies and response outcomes, IT exploration positively relates with competitive performance (via market capitalization) while IT exploitation contributes to stability (via operational adjustment) without directly improving performance. Finally, responding to our third question about comparing the effectiveness of IT ambidexterity with one-sided IT exploration or IT exploitation, the results indicate that IT ambidexterity weakens adaptation outcomes unless both IT exploration and IT exploitation are very highly developed. Interaction analysis reveals that generally IT exploration reduces the impact of IT exploitation on swift operational adjustments when IT exploitation is low, and vice versa for swift market capitalizing. These insights emphasize the need for adaptable IT strategies tailored to crisis contexts.

Table 7. Mediation analysis

Path	Direct effect (ß)	Direct effect bias corrected 95% CI	Indirect effect via IT exploration (ß)	Indirect effect bias corrected 95% CI (via IT exploration)	Indirect effect (via IT exploitation) (ß)	Indirect effect bias corrected 95% CI (via IT exploitation)
Organizational Alertness → Operational Adjustments	0.39*	[0.20, 0.55]	0.07NS	[−0.03, 0.18]	0.08*	[0.02, 0.17]
Organizational Alertness → Market Capitalizing	0.35*	[0.17, 0.52]	0.15*	[0.05, 0.26]	0.06NS	[−0.00, 0.14]

Note(s): *$p < 0.05$, NS Not significant, CI confidence interval

Source(s): Authors' own work

6.1 Theoretical implications

This study advances ambidexterity theory by moving beyond static balance models to propose a contingent, capability-dependent perspective on crisis management. While prior studies have extensively, but often separately, examined exploration, exploitation or ambidexterity in stable environments, there is limited understanding of their relative effectiveness under time-sensitive and highly uncertain conditions such as crisis (Singh *et al*., 2023). Traditional theory emphasizes the benefits of simultaneous duality, often taking a static perspective that ambidexterity benefits sustained competitive advantage over the long run. In particular, crisis scenarios fundamentally differ from business-as-usual contexts, requiring rapid strategic recalibration (Ahn *et al*., 2018). Thus, it is imperative to identify which strategic responses benefit organizations' competitive performance during crisis, and to understand how such strategies can be effectively developed (Wenzel *et al*., 2020). We unpack the "black box" of crisis response by examining how one-sided (exploration or exploitation) and combined (ambidexterity) strategies are enabled through organizational alertness and enacted through IT-enabled capabilities, offering a more granular and comparative understanding of their respective and combined effects on short-term crisis adaptation and competitive outcomes. Accordingly, we offer three main theoretical implications from the perspectives of ambidexterity theory and dynamic capabilities.

First, we introduce organizational alertness as a pre-strategic capability extending ambidexterity theory by theorizing how it facilitates exploration, exploitation, or both. While alertness has often been discussed in risk management as part of continuity planning or environmental analysis (Herbane *et al*., 2004; Li *et al*., 2022; Torabi *et al*., 2014), its role in enabling differentiated IT-enabled strategies (exploration, exploitation, or ambidexterity) has not been sufficiently theorized. Unlike traditional ambidexterity research, which mainly focuses on how organizations balance dual strategic activities, we position alertness as a foundational sensing mechanism that supports IT-enabled strategy deployment. Our mediation analysis supports this view: IT exploration partially mediates the relationship between alertness and market capitalizing, while IT exploitation partially mediates the relationship between alertness and operational adjustment. These results indicate that while organizational alertness is essential for sensing external changes, its effectiveness in terms of strategic responses depends on the deployment of targeted IT capabilities. Thus, alertness paired with IT exploration supports the swift translation of foresight into market responsiveness, while when combined with IT exploitation, it supports rapid operational optimizations. This extends ambidexterity theory by identifying organizational alertness as a key antecedent of distinct IT capabilities to support different forms of strategic adaptation under high levels of uncertainty experienced during a crisis.

Second, we challenge the conventional exploration-exploitation trade-off assumed in conventional work based on ambidexterity theory. In stable environments, exploitation usually provides short-term performance benefits, while exploration is often linked to longer-term gains but may initially hinder short-term performance due to increased uncertainty (He and Wong, 2004). In contrast, we demonstrate that IT exploration linked to swift market capitalizing is the most effective strategy for competitive performance in crises in the short term. In contrast, IT exploitation (linked to operational adjustments) shows no direct short-term performance relationship. These findings suggest that the logic of trade-offs shifts under turbulence and reinforced the importance of context-dependent strategic responses, which aligns with critiques of long-term duality advantages (D'Aveni *et al*., 2010; O'Shannassy, 2008; Wiggins and Ruefli, 2005) and the value of quick strategic actions in volatile contexts (Huang *et al*., 2015).

Third, we question the assumption of universal ambidexterity benefits (Bechthold *et al*., 2021; Heckmann and Maedche, 2018). While simultaneous exploration and exploitation are often advocated, our findings reveal that in crises, ambidexterity may dilute performance, particularly when either IT exploration or IT exploitation capability is underdeveloped. This contrasts with stable-environment findings where ambidexterity aids innovation and digital

transformation (Gregory *et al*., 2015; Syed *et al*., 2020), but also with prior research that favored internal contextual ambidexterity (Gibson and Birkinshaw, 2004). Indeed, in crisis conditions, separating exploration and exploitation structurally or temporally can be more effective than relying on contextual ambidexterity alone, which assumes individuals self-regulate exploration-exploitation switching. During crises, which typically involve high-pressure situations, organizations with underdeveloped capabilities may be overwhelmed by exploration-exploitation decisions, leading to resource strain and performance struggle. Theoretically, these insights support our notion of environmentally contingent ambidexterity as a situationally adaptive approach that aligns exploration-exploitation strategies with environmental and capability-based contingencies. They highlight the conditions under which pursuing ambidexterity may be suboptimal or counterproductive compared to an emphasis on either exploration or exploitation in crisis settings.

6.2 Practical implications

Our findings offer several actionable insights for crisis management. First, organizations should view organizational alertness as a foundational capability for IT-enabled crisis strategies. Alertness is important for detecting early external change, but its strategic impact is related with how IT is utilized. To operationalize this, organizations can institutionalize regular business-impact analyses to assess different risk scenarios, enhance their understanding of software application dependencies, ensuring that IT systems are resilient and integrated to support both IT exploration and IT exploitation during crises. These practices enhance proactive threat detection and improve alignment between emerging risks and IT-enabled response strategies.

Second, our findings suggest that organizations should carefully consider which IT-enabled strategy aligns best with their crisis context. When immediate survival is the priority, focusing on IT exploitation for operational adjustment ensures continuity. However, for organizations seeking to improve their competitive position during crises, IT exploration for market capitalizing is the more effective pathway. Organizations should recognize that while IT exploitation is necessary for continuity, it does not drive competitive performance in crises. This insight is particularly relevant for decision-makers assessing where to allocate limited resources during turbulent periods.

Lastly, while it may appear theoretically optimal, our findings suggest that ambidexterity can lead to diminished returns if either IT exploration or exploitation is underdeveloped. Organizations with underdeveloped IT capabilities for exploration or exploitation that attempt to balance both strategies simultaneously during crises may experience diminished effectiveness, leading to suboptimal adaptation outcomes. Instead, they should consider sequentially shifting between exploration and exploitation based on crisis dynamics, aligning with the concept of dynamic ambidexterity (Luger *et al*., 2018). Further, in non-crisis periods, they could attempt developing both IT capabilities (for exploration and exploitation), ensuring that when fully matured, they are better prepared to seamlessly apply an ambidextrous IT strategy in future crises without compromising effectiveness.

6.3 Limitations and future research

This study has limitations that warrant further investigation. First, the research was conducted in Austria, Germany and Switzerland, which may limit the generalizability of findings to other countries with different economic and cultural contexts. Future research should replicate the study in other regions to assess the robustness of our findings. Second, our study employed a cross-sectional design. While this approach provides valuable insights into immediate crisis responses, it does not account for long-term strategic adaptations. Longitudinal studies examining how IT exploration, IT exploitation, and IT ambidexterity evolve over time would enhance understanding of crisis recovery dynamics. Third, while our findings suggest that IT ambidexterity weakens adaptation effectiveness in crises, further research is needed to explore

the conditions under which IT ambidexterity could be beneficial. Future studies should investigate whether specific organizational structures, leadership approaches, or industry conditions interact with the effectiveness of IT ambidexterity in crisis contexts. Finally, our study highlights the need for research on co-evolutionary adaptation processes, where capabilities dynamically influence each other over time. Understanding how IT exploration and IT exploitation develop and interact across different crisis phases would provide deeper insights into strategic resilience.

About the authors

Everist Limaj is currently Associate Professor in the Department of Information Systems and Operations at the Vienna University of Economics and Business (WU) in Austria. His main research lies on solving digital transformation challenges related to the creation of modern organizations. His work has been published in top-tier international journals such as *Information and Management*, *Journal of Business Research and The Journal of Strategic Information Systems*. He is also regular member of academic bodies in the field of IS.

Nikolaus Obwegeser is Professor and Head of the Institute for Digital Technology Management at the Bern University of Applied Sciences (Switzerland). He received PhD in information business from WU Vienna (Austria) and previously held positions at IMD Business School (Switzerland), Aarhus University (Denmark), and EBS University (Germany). His current research interests include technology-driven innovation and transformation, with a particular focus on digital responsibility and sustainability. His research has appeared in highly-rated academic and practitioner outlets alike, such as *Technovation, the Journal of Product Innovation Management, or the MIT Sloan Management Review*. He regularly advises executives and policy makers on issues related to digital innovation and transformation.

Edward W. N. Bernroider is Professor of Management Information Systems and Head of the Institute of Information Management and Control at WU Vienna in Austria. His research focuses on current questions around digital transformation, control vs autonomy, and information security, and how these can impact individuals, organizations and entire societies. He has engaged in a variety of educational programs, international consultancies, and advisory activities for commercial and nonprofit enterprises, and has co-organized and presented his work at numerous international conferences. Many of his publications have appeared in top rated Information Systems and Operations Research journals. He currently serves on the editorial board of two leading IS journals and is regular member of academic and professional bodies.

(The Appendix follows overleaf)

Appendix 1

Table A1. Definitions of key constructs and measurement items

Construct (code)	Measurements	Adapted from
Organizational Alertness	(1) We regularly conduct systematic business-impact analysis for different risk scenarios (2) We understand the dependences between software applications (3) We imposed adequate business continuity requirements on our suppliers (4) Continuity plans are an integral part of developing new products or services	Järveläinen (2013)
IT Exploration	(1) Acquire new IT resources (e.g. change IT infrastructure, add new applications, gain new IT skills) (2) Experiment with new IT resources (3) Experiment with new IT management practices	Atuahene-Gima (2005), Lee *et al*. (2015), Nambisan *et al*. (1999), Ravichandran *et al*. (2005)
IT Exploitation	(1) Reuse existing IT components, such as hardware and network resources (2) Reuse existing IT applications and services (3) Reuse existing IT skills	
IT Ambidexterity[a]	Interaction term: IT Exploration x IT Exploitation (i.e. formed as a product of the IT Exploration and IT Exploitation items)	Gupta *et al*. (2006), Lee *et al*. (2015), (Rosing and Zacher (2017), Zhang *et al*. (2017)
Swift Market Capitalizing	(1) We made quick decisions in the face of market/customer changes (2) We quickly reinvented units to serve the changed market place (3) We quickly utilized market-related changes and chaos as opportunities to capitalize	Lu and Ramamurthy (2011), Panda (2022)
Swift Operational Adjustment	(1) We were quickly able to fulfill demands for special requests of your customers (2) We could quickly scale up or scale down our production/service levels to support changed demand (3) We quickly made alternative arrangements and internal adjustments to cope with supply disruptions	
Competitive Performance	(1) Profitability (2) Costs (3) Market share (4) Growth	Rai and Tang (2010)

Note(s):, [a]Used in the moderation analysis

Source(s): Authors' own work

Appendix 2
Robustness tests

(1) PLS-SEM vs PROCESS

To assess the robustness of the structural model estimated using PLS-SEM, we re-estimated the model using the PROCESS estimation procedure, which employs ordinary least squares (OLS) regression and is commonly used to test linear path models and moderation effects. Given that both models are based on different estimation philosophies, we present both results for transparency, rather than direct comparison. As reported in Tables A2 and A3, path coefficients are consistent in direction and significance across both estimation approaches. The only non-significant path in both models is from OADJ→COMP. Table A3 presents R^2 values for each endogenous construct across the two methods and shows only marginal differences. In summary, the robustness check using PROCESS as another estimation method confirms that our key findings are not sensitive to the estimation method.

Table A2. Path model evaluation: PLS-SEM vs PROCESS

Hypothesis	Path	PLS-SEM ß (*t*-value)	PROCESS ß (*t*-value)	Verdict
H1a	OAC→MCAP	0.35 (3.99*)	0.37 (4.08*)	Supported in both
H1b	OAC→OADJ	0.39 (4.31*)	0.40 (4.37*)	Supported in both
H2a	OAC→ITEXPR	0.55 (8.88*)	0.57 (8.53*)	Supported in both
H2b	OAC→ITEXPL	0.41 (5.30*)	0.34 (4.88*)	Supported in both
H3a	ITEXPR→MCAP	0.27 (2.91*)	0.64 (2.87*)	Supported in both
H3b	ITEXPL→OADJ	0.20 (2.51*)	0.69 (3.08*)	Supported in both
H4a	ITAMB→MCAP	−0.10 (1.86**)	−0.08 (1.85**)	Supported in both
H4b	ITAMB→OADJ	−0.13 (2.18*)	−0.10 (2.21*)	Supported in both
H5a	MCAP→COMP	0.29 (2.52*)	0.21 (2.51*)	Supported in both
H5b	OADJ →COMP	0.06 (0.48)	0.06 (0.70)	Not supported in both

Note(s): *p-value <0.05, **p-value <0.10
Source(s): Authors' own work

Note: The moderation effects were estimated using both PLS-SEM and PROCESS, with consistent results across both methods.

Table A3. R^2 values: PLS-SEM vs PROCESS

Construct	R^2 PLS-SEM	R^2 PROCESS
COMP	0.12	0.11
ITEXPL	0.16	0.16
ITEXPR	0.30	0.29
MCAP	0.40	0.40
OADJ	0.39	0.29

Source(s): Authors' own work

(2) Alternative Model Specifications for Robustness

Table A4 presents a summary of the results of a series of additional tests that we conducted to examine the stability of our findings under plausible alternative model specifications. Specifically, for the alternative

model 1 we applied reverse causality to test whether the direction of influence could plausibly run from performance outcomes back to capabilities. We added paths from competitive performance (COMP) to MCAP and OADJ, which leaded to no significant effects (β = 0.08; β = 0.02), while the original forward paths remained significant. Further, in alternative model 2, we assess omitted variable bias to evaluate the explanatory necessity of the organizational agility construct (OAC). We omitted the independent construct OAC, leading coefficients from ITEXPR to MCAP and OADJ to inflate and/or gain significance, while interaction effects, i.e. IT ambidexterity (ITAMB) weaken. This pattern is characteristic of omitted-variable bias and underscores OAC's essential explanatory role. The inflation without improving theoretical coherence signals that the pared-down model is less credible and less parsimonious. Lastly, in alternative model 3 we use outcome domain specificity to test whether our predictors uniquely explain competitive performance or could also account for unrelated outcomes (e.g. government support). We replaced competitive performance (COMP) with government support (GOVSUP) as the outcome, and re-estimating the model produced only non-significant paths (e.g. MCAP → GOVSUP: β = −0.05). This shows that the predictive power of our capability constructs is performance-specific, not generic.

Table A4. Beta coefficients (ß) for Baseline and Alternative Models

Path	Baseline ß	Alternative 1 ß	Alternative 2 ß	Alternative 3 ß
OAC→MCAP	0.35***	0.33***		0.35***
OAC→OADJ	0.39***	0.38***		0.39***
OAC→ITEXPR	0.55***	0.55***		0.55***
OAC→ITEXPL	0.41***	0.41***		0.41***
ITEXPR→MCAP	0.27***	0.25**	0.43***	0.27***
ITEXPL→OADJ	0.20**	0.20**	0.28***	0.20**
ITAMB→MCAP	−0.10*	−0.10*	-0.07^{NS}	−0.10*
ITAMB→OADJ	−0.13**	−0.13**	-0.09^{NS}	−0.13**
MCAP→COMP	0.29***		0.29**	
OADJ →COMP	0.06^{NS}		0.07^{NS}	
COMP→MCAP		0.08^{NS}		
COMP→OADJ		0.02^{NS}		
MCAP→GOVSUP				-0.05^{NS}
OADJ →GOVSUP				-0.08^{NS}

Note(s): ***p-value < 0.001, **p-value < 0.05, *p-value < 0.10, NS-not significant

Source(s): Authors' own work

Together, these robustness checks provide convergent support for the validity, theoretical consistency, and domain relevance of our model. Across all three alternatives, the original model's paths remain stable and theoretically coherent, confirming the robustness of our findings.

References

Ahn, J.M., Mortara, L. and Minshall, T. (2018), "Dynamic capabilities and economic crises: has openness enhanced a firm's performance in an economic downturn?", *Industrial and Corporate Change*, Vol. 27 No. 1, pp. 49-63, doi: 10.1093/icc/dtx048.

Arru, M., Negre, E. and Rosenthal-Sabroux, C. (2019), *To Alert or not to Alert? that is the Question*, Vol. 52nd, HICSS, Hawaii.

Atuahene-Gima, K. (2005), "Resolving the capability–rigidity paradox in new product innovation", *Journal of Marketing*, Vol. 69 No. 4, pp. 61-83, doi: 10.1509/jmkg.2005.69.4.61.

Bajgoric, N. and Moon, Y.B. (2009), "Enhancing systems integration by incorporating business continuity drivers", *Industrial Management and Data Systems*, Vol. 109 No. 1, pp. 74-97, doi: 10.1108/02635570910926609.

Bajgorić, N., Turulja, L. and Alagić, A. (2022), *Always-On Business: Aligning Enterprise Strategies and IT in the Digital Age*, Springer, Cham.

Bakar, Z.A., Yaacob, N.A. and Udin, Z.M. (2015), "The effect of business continuity management factors on organizational performance: a conceptual framework", *International Journal of Economics and Financial Issues*, Vol. 5 No. 1, pp. 128-134.

Bechthold, L., Lude, M. and Prügl, R. (2021), "Crisis favors the prepared firm: how organizational ambidexterity relates to perceptions of organizational resilience", in Zehrer, A., Glowka, G., Schwaiger, K.M. and Ranacher-Lackner, V. (Eds), *Resiliency Models and Addressing Future Risks for Family Firms in the Tourism Industry*, IGI Global, Hershey, PA, pp. 178-205.

Benitez, J., Henseler, J., Castillo, A. and Schuberth, F. (2020), "How to perform and report an impactful analysis using partial least squares: guidelines for confirmatory and explanatory IS research", *Information and Management*, Vol. 57 No. 2, 103168, doi: 10.1016/j.im.2019.05.003.

Benitez, J., Castillo, A., Ruiz, L., Luo, X.R. and Prades, P. (2023), "How have firms transformed and executed IT-enabled remote work initiatives during the COVID-19 pandemic? Conceptualization and empirical evidence from Spain", *Information and Management*, Vol. 60 No. 4, 103789, doi: 10.1016/j.im.2023.103789.

Bettiol, M., Capestro, M., Maria, E.D. and Micelli, S. (2023), "Ambidextrous strategies in turbulent times: the experience of manufacturing SMEs during the COVID-19 pandemic", *International Journal of Physical Distribution and Logistics Management*, Vol. 53 No. 2, pp. 248-272, doi: 10.1108/ijpdlm-10-2021-0422.

Birkinshaw, J. and Gibson, C. (2004), "Building ambidexterity into an organization", *MIT Sloan Management Review*, Vol. 45 No. 4, pp. 287-298.

Boh, W., Constantinides, P., Padmanabhan, B. and Viswanathan, S. (2022), "Special issue introduction: building digital resilience against major shocks", *MIS Quarterly*, Vol. 47 No. 1, pp. 343-360.

Cao, Q., Gedajlovic, E. and Zhang, H. (2009), "Unpacking organizational ambidexterity: dimensions, contigencies, and synergestic effects", *Organization Science*, Vol. 20 No. 4, pp. 781-796, doi: 10.1287/orsc.1090.0426.

Carmine, S., Andriopoulos, C., Gotsi, M., Härtel, C.E.J., Krzeminska, A., Mafico, N., Pradies, C., Raza, H., Raza-Ullah, T., Schrage, S., Sharma, G., Slawinski, N., Stadtler, L., Tunarosa, A., Winther-Hansen, C. and Keller, J. (2021), "A paradox approach to organizational tensions during the pandemic crisis", *Journal of Management Inquiry*, Vol. 30 No. 2, pp. 138-153, doi: 10.1177/1056492620986863.

Chakma, R., Paul, J. and Dhir, S. (2024), "Organizational ambidexterity: a review and research agenda", *IEEE Transactions on Engineering Management*, Vol. 71, pp. 121-137, doi: 10.1109/TEM.2021.3114609.

Chin, W.W. (2010), "How to write up and report PLS analyses", in *Handbook of Partial Least Squares*, Springer, pp. 655-690.

Chin, W.W., Thatcher, J.B., Wright, R.T. and Steel, D. (2013), "Controlling for common method variance in PLS analysis: the measured latent marker variable approach", *New Perspectives in Partial Least Squares and Related Methods*, pp. 231-239, doi: 10.1007/978-1-4614-8283-3_16.

Chou, C., Liu, Y.-H. and Yang, K.-P. (2024), "Impacts of strategic exploitation and exploration on firms' survival likelihood after crises: a decision-tree analysis", *Long Range Planning*, Vol. 57 No. 1, 102374, doi: 10.1016/j.lrp.2023.102374.

Clauss, T., Kraus, S., Kallinger, F.L., Bican, P.M., Brem, A. and Kailer, N. (2021), "Organizational ambidexterity and competitive advantage: the role of strategic agility in the exploration-exploitation paradox", *Journal of Innovation and Knowledge*, Vol. 6 No. 4, pp. 203-213, doi: 10.1016/j.jik.2020.07.003.

Clauss, T., Breier, M., Kraus, S., Durst, S. and Mahto, R.V. (2022), "Temporary business model innovation – SMEs' innovation response to the Covid- 19 crisis", Special Issue: Providing Solutions in Emergencies: R&D and Innovation Management during Covid-19, Vol. 52 No. 2, pp. 294-312, doi: 10.1111/radm.12498.

Cronbach, L. (1951), "Coefficient alpha and the internal structure of tests", *Psychometrica*, Vol. 16 No. 3, pp. 297-334, doi: 10.1007/bf02310555.

D'Aveni, R.A., Dagnino, G.B. and Smith, K.G. (2010), "The age of temporary advantage", *Strategic Management Journal*, Vol. 31 No. 13, pp. 1371-1385, doi: 10.1002/smj.897.

Dijkstra, T.K. and Henseler, J. (2015), "Consistent and asymptotically normal PLS estimators for linear structural equations", *Computational Statistics and Data Analysis*, Vol. 81, pp. 10-23, doi: 10.1016/j.csda.2014.07.008.

Doblinger, C., Wales, W. and Zimmermann, A. (2022), "Stemming the downturn: how ambidexterity and public policy influence firm performance stability during economic crises", *European Management Journal*, Vol. 40 No. 2, pp. 163-174, doi: 10.1016/j.emj.2021.06.002.

Dolz, C., Iborra, M. and Safón, V. (2020), "Improving the likelihood of SME survival during financial and economic crises: the importance of TMTs and family ownership for ambidexterity", *Business Research Quarterly*, Vol. 22 No. 2, pp. 119-136, doi: 10.1016/j.brq.2018.09.004.

EC (2016), "Directive 95/46/EC (General Data Protection Regulation)", *Official Journal of the European Union, EU L*, Vol. 119, pp. 1-88.

Faertes, D. (2015), "Reliability of supply chains and business continuity management", *Procedia Computer Science*, Vol. 55, pp. 1400-1409, doi: 10.1016/j.procs.2015.07.130.

Gibson, C. and Birkinshaw, J. (2004), "The antecedents, consequences and mediating role of organizational ambidexterity", *Academic Management Journal*, Vol. 47 No. 2, pp. 209-226, doi: 10.2307/20159573.

Gkeredakis, M., Lifshitz-Assaf, H. and Barrett, M. (2021), "Crisis as opportunity, disruption and exposure: exploring emergent responses to crisis through digital technology", *Information and Organization*, Vol. 31 No. 1, 100344, doi: 10.1016/j.infoandorg.2021.100344.

Gregory, R.W., Keli, M., Muntermann, J. and Mahring, M. (2015), "Paradoxes and the nature of ambidexterity in IT transformation programs", *Information Systems Research*, Vol. 26 No. 1, pp. 57-80, doi: 10.1287/isre.2014.0554.

Gudergan, S.P., Moisescu, O.I., Radomir, L., Ringle, C.M. and Sarstedt, M. (2025), "Special issue editorial: advanced partial least squares structural equation modeling (PLS-SEM) applications in business research", *Journal of Business Research*, Vol. 188, 115087, doi: 10.1016/j.jbusres.2024.115087.

Gupta, A.K., Smith, K.G. and Shalley, C.E. (2006), "The interplay between exploration and exploitation", *Academy of Management Journal*, Vol. 49 No. 4, pp. 693-706, doi: 10.5465/amj.2006.22083026.

Güttel, W. and Konlechner, S. (2023), "Strategic change: exploration, exploitation and ambidexterity", in Güttel, W. (Ed.), *Successful in Turbulent Times: Leadership, Change Management, and Ambidexterity*, Nomos Verlagsgesellschaft mbH & Co. KG, pp. 271-301.

Hair, J.F., Hult, G.T.M., Ringle, C.M., Sarstedt, M., Danks, N.P. and Ray, S. (2021), "Moderation analysis", in *PLS-SEM Using R*, Springer, Cham.

Hair, Jr., J.F., Hult, G.T.M., Ringle, C.M. and Sarstedt, M. (2022), *A Primer on Partial Least Squares Structural Equation Modeling (PLS-SEM)*, SAGE.

Hair, J.F., Sarstedt, M., Ringle, C.M., Sharma, P.N. and Liengaard, B.D. (2024), "Going beyond the untold facts in PLS–SEM and moving forward", *European Journal of Marketing*, Vol. 58 No. 3, pp. 81-106, doi: 10.1108/ejm-08-2023-0645.

Hansen, E.G., Wicki, S. and Schaltegger, S. (2018), "Structural ambidexterity, transition processes, and integration trade-offs: a longitudinal study of failed exploration", *R&D Management*, Vol. 49 No. 4, pp. 484-508, doi: 10.1111/radm.12339.

He, Z.-L. and Wong, P.-K. (2004), "Exploration vs exploitation: an empirical test of the ambidexterity hypothesis", *Organization Science*, Vol. 15 No. 4, pp. 481-494, doi: 10.1287/orsc.1040.0078.

Heckmann, C.S. and Maedche, A. (2018), "IT ambidexterity for business processes: the importance of balance", *Business Process Management Journal*, Vol. 24 No. 4, pp. 862-881, doi: 10.1108/bpmj-04-2016-0078.

Herbane, B., Elliott, D. and Swartz, E.M. (2004), "Business continuity management: time for a strategic role?", *Long Range Planning*, Vol. 37 No. 5, pp. 435-457, doi: 10.1016/j.lrp.2004.07.010.

Huang, K.-F., Dyerson, R., Wu, L.-Y. and Harindranath, G. (2015), "From temporary competitive advantage to sustainable competitive advantage", *British Journal of Management*, Vol. 26 No. 4, pp. 617-636, doi: 10.1111/1467-8551.12104.

Huber, G.P. and Power, D.J. (1985), "Retrospective reports of strategic-level managers: guidelines for increasing their accuracy", *Strategic Management Journal*, Vol. 6 No. 2, pp. 171-180, doi: 10.1002/smj.4250060206.

Iborra, M., Safón, V. and Dolz, C. (2020), "What explains the resilience of SMEs? Ambidexterity capability and strategic consistency", *Long Range Planning*, Vol. 53 No. 6, pp. 1-15, doi: 10.1016/j.lrp.2019.101947.

Jansen, J.P., Van Den Bosch, F.A. and Volberda, H.W. (2006), "Exploratory innovation, exploitative innovation and performance: effects of organizational antecedents and environmental moderators", *Management Science*, Vol. 52 No. 6, pp. 1661-1674, doi: 10.1287/mnsc.1060.0576.

Jansen, J.J.P., Simsek, Z. and Cao, Q. (2012), "Ambidexterity and performance in multiunit contexts: cross-level moderating effects of structural and resource attributes", *Strategic Management Journal*, Vol. 33 No. 11, pp. 1286-1303, doi: 10.1002/smj.1977.

Järveläinen, J. (2013), "IT incidents and business impacts: validating a framework for continuity management in information systems", *International Journal of Information Management*, Vol. 33 No. 3, pp. 583-590, doi: 10.1016/j.ijinfomgt.2013.03.001.

Kettunen, P., Gustavsson, T., Laanti, M., Tjernsten, A., Mikkonen, T. and Männistö, T. (2021), "Impacts of COVID-19 pandemic for software development in nordic companies – agility helps to respond", *XP 2021 Workshops, LNBIP*, Vol. 426, pp. 33-41, doi: 10.1007/978-3-030-88583-0_4.

Kock, N. (2015), "Common method bias in PLS-SEM: a full collinearity assessment approach", *International Journal of e-Collaboration*, Vol. 11 No. 4, pp. 1-10, doi: 10.4018/ijec.2015100101.

Kock, N. and Lynn, G. (2012), "Lateral collinearity and misleading results in variance-based SEM: an illustration and recommendations", *Journal of the Association for Information Systems*, Vol. 13 No. 7, pp. 546-580, doi: 10.17705/1jais.00302.

Lee, O., Sambamurthy, V., Lim, K. and Wei, K. (2003), "The moderating effects of environmental dynamism on the links between IT management and agility: a moderated mediation analysis", Working paper, University of Massachusetts, Boston.

Lee, O.-K., Lim, K. and Wei, K.-K. (2004), *The Roles of Information Technology in Organizational Capability Building: an IT Capability Perspective*, ICIS.

Lee, O.-K.D., Sambamurthy, V., Lim, K.H. and Wei, K.K. (2015), "How does IT ambidexterity impact organizational agility?", *Information Systems Research*, Vol. 26 No. 2, pp. 398-417, doi: 10.1287/isre.2015.0577.

Li, L., Lin, J., Turel, O., Liu, P. and Luo, X. (2020), "The impact of e-commerce capabilities on agricultural firms' performance gains: the mediating role of organizational agility", *Industrial Management and Data Systems*, Vol. 120 No. 7, pp. 1265-1286, doi: 10.1108/imds-08-2019-0421.

Li, L., Tong, Y., Wei, L. and Yang, S. (2022), "Digital technology-enabled dynamic capabilities and their impacts on firm performance: evidence from the COVID-19 pandemic", *Information and Management*, Vol. 59 No. 8, 103689, doi: 10.1016/j.im.2022.103689.

Liang, H., Wang, N. and Xue, Y. (2022), "Juggling information technology (IT) exploration and exploitation: a proportional balance view of IT ambidexterity", *Information Systems Research*, Vol. 33 No. 4, pp. 1386-1402, doi: 10.1287/isre.2022.1105.

Limaj, E., Bernroider, E.W.N. and Choudrie, J. (2016), "The impact of social information system governance, utilization and capabilities on absorptive capacity and innovation: a case of Austrian SMEs", *Information and Management*, Vol. 53 No. 3, pp. 380-397, doi: 10.1016/j.im.2015.12.003.

Lin, J., Li, L., Luo, X.R. and Benitez, J. (2020), "How do agribusinesses thrive through complexity? The pivotal role of E-Commerce capability and business agility", *Decision Support Systems*, Vol. 135, pp. 1-13, doi: 10.1016/j.dss.2020.113342.

Liu, H., Song, D. and Cai, Z. (2014), *Knowledge Management Capability and Firm Performance: The Mediating Role of Organizational Agility*, PACIS, Chengdu, China.

Lu, Y. and Ramamurthy, K.R. (2011), "Understanding the link between information technology capability and organizational agility", *MIS Quarterly*, Vol. 35 No. 4, pp. 931-954.

Luger, J., Raisch, S. and Schimmer, M. (2018), "Dynamic balancing of exploration and exploitation: the contingent benefits of ambidexterity", *Organization Science*, Vol. 29 No. 3, pp. 357-546, doi: 10.1287/orsc.2017.1189.

MacKenzie, S.B., Podsakoff, P.M. and Podsakoff, N.P. (2011), "Construct measurement and validation procedures in MIS and behavioral research: integrating new and existing techniques", *MIS Quarterly*, Vol. 35 No. 2, pp. 293-334, doi: 10.2307/23044045.

Malhotra, N.K., Kim, S.S. and Patil, A. (2006), "Common method variance in IS research: a comparison of alternative approaches and a reanalysis of past research", *Management Science*, Vol. 52 No. 12, pp. 1865-1883, doi: 10.1287/mnsc.1060.0597.

Manley, S.C., Hair, J.F., Jr, R.I.W. and McDowell, W.C. (2021), "Essential new PLS-SEM analysis methods for your entrepreneurship analytical toolbox", *International Entrepreneurship and Management Journal*, Vol. 17 No. 4, pp. 1805-1825, doi: 10.1007/s11365-020-00687-6.

Mao, H., Liu, S., Zhang, J., Zhang, Y. and Gong, Y. (2021), "Information technology competency and organizational agility: roles of absorptive capacity and information intensity", *Information Technology and People*, Vol. 34 No. 1, pp. 421-451, doi: 10.1108/itp-12-2018-0560.

March, J.G. (1991), "Exploration and exploitation in organizational learning", *Organization Science*, Vol. 2 No. 1, pp. 71-87, doi: 10.1287/orsc.2.1.71.

Mithas, S., Ramasubbu, N. and Sambamurthy, V. (2011), "How information management capability influences firm performance", *MIS Quarterly*, Vol. 35 No. 1, pp. 237-256, doi: 10.2307/23043496.

Nambisan, S. (2002), "Designing virtual customer environments for new product development: toward a theory", *The Academy of Management Review*, Vol. 27 No. 3, pp. 392-413, doi: 10.2307/4134386.

Nambisan, S., Agarwal, R. and Tanniru, M. (1999), "Organizational mechanisms for enhancing user innovation in information technology", *MIS Quarterly*, Vol. 23 No. 3, pp. 365-395, doi: 10.2307/249468.

O'Reilly, C. and Tushman, M. (2013), "Organizational ambidexterity: past, present, and future", *Academy of Management Perspectives*, Vol. 27 No. 4, pp. 324-338, doi: 10.5465/amp.2013.0025.

O'Shannassy, T. (2008), "Sustainable competitive advantage or temporary competitive advantage: improving understanding of an important strategy construct", *Journal of Strategy and Management*, Vol. 1 No. 2, pp. 168-180, doi: 10.1108/17554250810926357.

Osiyevskyy, O., Shirokova, G. and Ritala, P. (2020), "Exploration and exploitation in crisis environment: implications for level and variability of firm performance", *Journal of Business Research*, Vol. 114, pp. 227-239, doi: 10.1016/j.jbusres.2020.04.015.

O'Reilly, C. and Tushman, M. (2004), "The ambidextrous organization", *Harvard Business Review*, Vol. 82 No. 4, pp. 74-83.

Panda, S. (2022), "Strategic IT-Business alignment capability and organizational performance: roles of organizational agility and environmental factors", *Journal of Asia Business Studies*, Vol. 16 No. 1, pp. 25-52, doi: 10.1108/jabs-09-2020-0371.

Pinheiro, B., Henriques, I., Almeida, L. and Franco, M. (2024), "Entrepreneurial alertness as a determinant of success in the SME context: a qualitative study", *International Journal of Organizational Analysis*, Vol. 32 No. 3, pp. 545-564, doi: 10.1108/ijoa-11-2022-3501.

Queiroz, M., Tallon, P.P., Sharma, R. and Coltman, T. (2018), "The role of IT application orchestration capability in improving agility and performance", *The Journal of Strategic Information Systems*, Vol. 27 No. 1, pp. 4-21, doi: 10.1016/j.jsis.2017.10.002.

Rai, A. and Tang, X. (2010), "Leveraging IT capabilities and competitive process capabilities for the management of interorganizational relationship portfolios", *Information Systems Research*, Vol. 21 No. 3, pp. 516-542, doi: 10.1287/isre.1100.0299.

Raisch, S., Birkinshaw, J., Probst, G. and Tushman, M.L. (2009), "Organizational ambidexterity: balancing exploitation and exploration for sustained performance", *Organization Science*, Vol. 20 No. 4, pp. 685-695, doi: 10.1287/orsc.1090.0428.

Ravichandran, T. (2018), "Exploring the relationships between IT competence, innovation capacity and organizational agility", *Journal of Strategic Information Systems*, Vol. 27 No. 1, pp. 22-42, doi: 10.1016/j.jsis.2017.07.002.

Ravichandran, T., Lertwongsatien, C. and Lertwongsatien, C. (2005), "Effect of information systems resources and capabilities on firm performance: a resource-based perspective", *Journal of Management Information Systems*, Vol. 21 No. 4, pp. 237-276, doi: 10.1080/07421222.2005.11045820.

Rosing, K. and Zacher, H. (2017), "Individual ambidexterity: the duality of exploration and exploitation and its relationship with innovative performance", *European Journal of Work and Organizational Psychology*, Vol. 26 No. 5, pp. 94-709, doi: 10.1080/1359432x.2016.1238358.

Salamzadeh, A. and Dana, L.P. (2022), "A systematic literature review of crisis management in and by small and medium-sized enterprises", in Etemad, H. (Ed.), *Small and Medium Sized Enterprises and the COVID-19 Response*, Edward Elgar Publishing, pp. 38-61.

Sanasi, S. and Ghezzi, A. (2022), "Pivots as strategic responses to crises: evidence from Italian companies navigating Covid-19", *Strategic Organization*, Vol. 22 No. 3, pp. 495-529, doi: 10.1177/14761270221122933.

Sarstedt, M., Ringle, C.M. and Hair, J.F. (2021), "Partial least squares structural equation modeling", in *Handbook of Market Research*, Springer, pp. 1-47.

Sharma, P.N., Liengaard, B.D., Hair, J.F., Sarstedt, M. and Ringle, C.M. (2023), "Predictive model assessment and selection in composite-based modeling using PLS-SEM: extensions and guidelines for using CVPAT", *European Journal of Marketing*, Vol. 57 No. 6, pp. 1662-1677, doi: 10.1108/ejm-08-2020-0636.

Shrivastava, U., Hazarika, B. and Rea, A. (2021), "Restoring clinical information system operations post data disaster: the role of IT investment, integration and interoperability", *Industrial Management and Data Systems*, Vol. 121 No. 12, pp. 2672-2696, doi: 10.1108/imds-03-2021-0128.

Siggelkow, N. and Levinthal, D. (2003), "Temporarily divide to conquer: centralized, decentralized, and reintegrated organizational approaches to exploration and adaptation", *Organization Science*, Vol. 14 No. 6, pp. 650-669, doi: 10.1287/orsc.14.6.650.24840.

Singh, A., Lim, W.M., Jha, S., Kumar, S. and Ciasullo, M.V. (2023), "The state of the art of strategic leadership", *Journal of Business Research*, Vol. 158, 113676, doi: 10.1016/j.jbusres.2023.113676.

Smara, R., Bogatyreva, K., Laskovaia, A. and Wagoner, H.P.V. (2022), "Does striking a balance pay off? Implications of innovative ambidexterity for SMEs during COVID-19 crisis", *Journal of Entrepreneurship in Emerging Economies*, Vol. 16 No. 3, pp. 649-674, doi: 10.1108/jeee-05-2022-0139.

Song, M., Nason, R.W. and Benedetto, C.A.D. (2008), "Distinctive marketing and information technology capabilities and strategic types: a cross-national investigation", *Journal of International Marketing*, Vol. 16 No. 1, pp. 4-38, doi: 10.1509/jimk.16.1.4.

Srivastavaa, S., Sahaym, A. and Allison, T.H. (2020), "Alert and awake: role of alertness and attention on rate of new product introductions", *Journal of Business Venturing*, Vol. 36 No. 4, 106023, doi: 10.1016/j.jbusvent.2020.106023.

Swartz, E., Elliott, D. and Herbane, B. (2003), "Greater than the sum of its parts: business continuity management in the UK finance sector", *Risk Management*, Vol. 5 No. 1, pp. 65-80, doi: 10.1057/palgrave.rm.8240140.

Syed, T.A., Blome, C. and Papadopoulos, T. (2020), "Impact of IT ambidexterity on new product development speed: theory and empirical evidence", *Decision Sciences*, Vol. 51 No. 3, pp. 655-690, doi: 10.1111/deci.12399.

Tallon, P.P., Queiroz, M. and Coltman, T. (2022), "Digital-enabled strategic agility: the next Frontier", Vol. 31 No. 6, pp. 641-652, 10.1080/0960085x.2022.2102713.

Tang, J., Baron, R.A. and Yu, A. (2023), "Entrepreneurial alertness: exploring its psychological antecedents and effects on firm outcomes", *Journal of Small Business Management*, Vol. 61 No. 6, pp. 2879-2908, doi: 10.1080/00472778.2021.1945071.

Teece, D., Peteraf, M. and Leih, S. (2016), "Dynamic capabilities and organizational agility: risk, uncertainty, and strategy in the innovation economy", *California Management Review*, Vol. 58 No. 4, pp. 13-35, doi: 10.1525/cmr.2016.58.4.13.

Torabi, S.A., Soufi, H.R. and Navid, S. (2014), "A new framework for business impact analysis in business continuity management (with a case study)", *Safety Science*, Vol. 68, pp. 309-323, doi: 10.1016/j.ssci.2014.04.017.

Van der Stede, W.A., Young, M.S. and Chen, X.C. (2006), "Doing management accounting Survey research", in Chapman, C.S., Hopwood, A.G. and Shields, M.D. (Eds), *Handbooks of Management Accounting Research*, Elsevier, Vol. 1, pp. 445-478.

Wenzel, M., Stanske, S. and Lieberman, M.B. (2020), "Strategic responses to crisis", *Strategic Management Journal*, Vol. 41 No. Virtual Special Issue, pp. V7-V18.

Wiesböck, F., Hess, T. and Spanjol, J. (2020), "The dual role of IT capabilities in the development of digital products and services", *Information and Management*, Vol. 57 No. 8, 103389, doi: 10.1016/j.im.2020.103389.

Wiggins, R.R. and Ruefli, T.W. (2005), "Schumpeter's ghost: is hypercompetition making the best of times shorter?", *Strategic Management Journal*, Vol. 26 No. 10, pp. 887-911, doi: 10.1002/smj.492.

Zahra, S.A. and George, G. (2002), "Absorptive capacity: a review, reconceptualization, and extension", *Academy of Management Review*, Vol. 27 No. 2, p. 185, doi: 10.2307/4134351.

Zhang, F., Wang, Y., Li, D. and Cui, V. (2017), "Configurations of innovations across domains: an organizational ambidexterity view", *Journal of Product Innovation Management*, Vol. 34 No. 6, pp. 821-841, doi: 10.1111/jpim.12362.

Zhen, J., Xie, Z. and Dong, K. (2021), "Impact of IT governance mechanisms on organizational agility and the role of top management support and IT ambidexterity", *International Journal of Accounting Information Systems*, Vol. 40, pp. 1-15, doi: 10.1016/j.accinf.2021.100501.

Zhou, J., Bi, G., Liu, H., Fang, Y. and Hua, Z. (2018), "Understanding employee competence, operational IS alignment, and organizational agility – an ambidexterity perspective", *Information and Management*, Vol. 55 No. 6, pp. 695-708, doi: 10.1016/j.im.2018.02.002.

Corresponding author
Everist Limaj can be contacted at: everist.limaj@wu.ac.at