Is Knowledge Ambidexterity the Answer to Economic Sustainability for SMEs? Lessons Learned from Digitalisation Efforts During the COVID-19 Pandemic

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Introduction

Businesses need to be agile to respond to changing business circumstances in order to leverage economic sustainability. The COVID-19 pandemic has induced a global economic slowdown. In challenging situations, knowledge ambidexterity (KA) can assist organisations in adapting to uncertain environments (Papadopoulos et al., 2020). Being ambidextrous while managing knowledge is about using extensive knowledge (Scuotto et al., 2019) to tackle such unprecedented challenges. KA is a generic strategy wherein organisations can simultaneously explore and exploit knowledge (Tushman & O'Reilly, 1996). *Knowledge exploitation* is about using firms' existing knowledge base to respond rapidly to the changing

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environment, whereas *knowledge exploration* focuses on searching for new knowledge to adjust to changing business conditions. With a simultaneous approach of using knowledge exploration and exploitation (i.e., KA), companies can utilise knowledge effectively to combat business challenges.

This chapter focuses on SMEs, as they are often the most vulnerable business sector in most countries. Over 90% of organisations in most countries belong to the SME category, and they play a pivotal role in instigating economic growth, providing employment and creating wealth (Lin, 2014). As per OECD (2020), more than 50% of SMEs fail in a span of ten years, mostly attributed to the lack of digital resources and knowledge capabilities. SMEs are considered as entities without strategy (Cerchione & Esposito, 2017), lacking the flexibility to adapt to economic uncertainty. The demand for latest knowledge will continuously occur because existing knowledge may not be sufficient for solving new problems for SMEs (Papadopoulos et al., 2020; Saratchandra & Shrestha, 2022). Likewise, knowledge is currently managed using ad hoc and traditional methods. These constraints have worsened the business situation for SMEs. Unfortunately, when faced with major economic disruptions such as the COVID-19 pandemic, many SMEs do not survive. Several studies have emphasised that the pandemic has caused massive shutdown of SMEs due to these limitations (Bartik et al., 2020).

Scholars have proposed a variety of solutions to resolve this crisis scenario in SMEs. One of the most important trends found in current literature involves readjusting business strategies by incorporating crisis scenarios and business continuity plans to enhance sustainable development (Viswanathan & Telukdarie, 2021). The literature also suggests that the newly chosen strategy should aid the organisation to immediately respond to any crisis (Mitręga & Choi, 2021). In this context, we suggest that SMEs follow a strategy of implementing KA to ensure their competitiveness in unpredictable environments (Hanifah et al., 2019; Shrestha & Chandra, 2020).

KA can be achieved with the support of digital technologies. Prior studies state that digital systems play a vital role in achieving organisational ambidexterity (Ardito et al., 2018) and acts as an enabler of organisational knowledge management (KM), irrespective of industry (Kapoor & Aggarwal, 2021). Digitalisation can play two key roles—it supports managing the generated knowledge, and it can facilitate KA in SMEs. However, various studies have emphasised that it is difficult

for SMEs to become knowledge ambidextrous as compared to larger organisations (Dolz et al., 2019). A major hindering factor is knowledge availability. Since the knowledge acquired from external stakeholders, a major knowledge source, can be missed or mishandled in SMEs, this leads to knowledge unavailability (Al-Emran et al., 2018). Moreover, KA in SMEs is reported to be in a *compromised* state, showing a stronger inclination towards knowledge exploitation (Randall et al., 2017). Consequently, knowledge exploration processes are compromised due to high costs, uncertain business environments and operational risks. Therefore, SMEs have greater problems in balancing these competing constraints—that is, the lack of KA (de Araújo Lima et al., 2020). We can thus safely conclude that SMEs generally are unfavourably positioned to achieve KA.

Digitalisation entails a fundamental reinvention of doing things in an innovative way (S. M. Lee & Trimi, 2021). The widespread availability of digital infrastructure has enabled worldwide access to open knowledge in an easier and more convenient manner, facilitating knowledge exploration and exploitation processes simultaneously, thereby helping achieve KA. Digitisation efforts can reconfigure and manage SMEs' knowledge or competencies to be more agile in adapting to uncertain environments (Papadopoulos et al., 2020). Thus, we can say that digitalisation plays a vital role in achieving KA in SMEs. However, there are limited studies that show how to effectively utilise digital technologies for achieving KA for SMEs.

By focusing on the simultaneous execution of knowledge exploration and knowledge exploitation with the support of digital technologies, we aim to provide new insights into the literature on how SMEs may achieve KA in an efficient way to leverage economic sustainability. This paper is structured as follows: first, we discuss the theoretical background by reviewing current research in this area. We then outline our methodological approach and report the findings of our empirical case studies to present an optimal route for SMEs to become ambidextrous. Finally, we conclude with a discussion of our study implications.

Literature Review

Knowledge Ambidexterity (KA)

KA is the simultaneous process of knowledge exploration and knowledge exploitation that promotes organisational knowledge without changing organisational processes (March, 1991; Tushman & O'Reilly, 1996). *Knowledge exploration* is the process of searching and identifying new knowledge, thereby bringing *radical* innovation to the firm, leading to novel products, processes and innovative solutions to problems. Likewise, *knowledge exploitation* is the process of improving or refining existing knowledge, thereby bringing *incremental* innovation to any organisation by leveraging the application of pre-established knowledge, technologies and solutions. This implies that KA is an important source of knowledge for any organisation's innovation (Durcikova et al., 2011) and knowledge enhancement (Scuotto et al., 2019).

Role of KA Towards Economic Sustainability

Gro Harlem Brundtland's, 1985 report, created for the World Commission on Environment and Development (WCED), defined *sustainability* as the development that meets the needs of the present generation without compromising the ability of future generations to meet their own needs (Brundtland, 1985). In our context, economic sustainability mainly supports managing development of communities, industry sectors and countries to ensure efficient resource use and creation of new businesses to strengthen economies (Presley et al., 2007). KA plays a vital role in leveraging economic sustainability in the SME sector during any crisis. Through KA, SMEs can reinvent their business for the future, leverage innovation and improve existing business processes. KA is a dynamic capability that aids SMEs to concentrate their efforts on knowledge exploration and knowledge exploitation activities. To sustain during crises such as the ones presented by COVID-19, organisations should identify relevant information about markets, business opportunities and threats in a timely manner. This implies that SMEs may be able to sustain their operations if they can acquire latest and relevant knowledge critical for their business. To elaborate, knowledge exploitation leverages firms' existing knowledge base and helps them outperform competitors by making effective changes in existing products/processes (Benitez et al., 2018), and knowledge exploration focuses on identifying and acquiring

new knowledge and creates impactful innovations (Benitez et al., 2018). Hence, through the simultaneous application of knowledge exploration and exploitation, SMEs can sustain against the current and changing business environments.

Despite KA being a theoretically sound concept to leverage economic sustainability, it is very difficult to achieve KA in practice (Adler & Heckscher, 2013). This is particularly true for SMEs, as they seldom focus on both knowledge exploration and exploitation activities, and these activities always compete for the scarce resources available to SMEs. In reality, SMEs are more inclined to knowledge exploitation, owing to the constraints in the knowledge exploration process (Randall et al., 2017). Moreover, prior studies posit that managers play a vital role in achieving KA in SMEs (Berraies et al., 2020), as they allocate resources, make decisions and control vital processes in the firm. However, there are studies available that emphasise the difficulty of individuals in managing exploratory and exploitative tasks simultaneously (Shamim et al., 2019). Further, knowledge explored from external sources such as suppliers, customers and other stakeholders has become difficult for SMEs to utilise during the COVID-19 pandemic due to lockdown and shutdown of factories. Sinha (2019) posits that ambidexterity happens by serendipity, implying that conflict exists in understanding any managed pathways of achieving KA in SMEs.

Role of Digitalisation in Achieving KA

Digitalisation can be defined as the utilisation of digital opportunities to modify the structure of business processes (Matarazzo et al., 2021). SMEs lag behind digitalisation efforts because they do not have resources to procure digital services (Eller et al., 2020). This created a problem when the COVID-19 pandemic erupted, as SMEs were not utilising the available digital technologies to manage supply chain operations and business–client relationships (Caballero-Morales, 2021). SMEs have limited experience on how to utilise digital technologies effectively to achieve KA. Scuotto et al. (2019) posit that the ambidextrous approach is improved with the use of digital technologies. This implies that if an organisation utilises the right digitalisation strategies under the appropriate organisational and environmental conditions; KA can be achieved (Ardito et al., 2018). Soto-Acosta et al. (2018) empirically proved that digital technologies and KM are the two major pillars of KA, but they have not

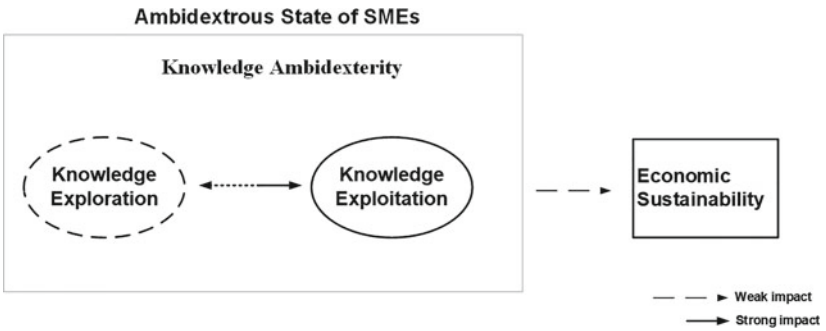

Fig. 1 Framework for knowledge ambidexterity for leveraging economic sustainability

provided a holistic approach for achieving KA by adopting digital technologies and KM. Moreover, intense competitive pressure poses greater challenges to SMEs, and hence, they require an appropriate environment in which innovative ideas can arise and grow for their economic sustainability (Niewöhner et al., 2019). As a result, there are limited studies demonstrating the effective utilisation of digitalisation for achieving KA in SMEs. Therefore, we pose our research question: *What is the role of digitalisation in knowledge ambidexterity towards achieving economic sustainability for SMEs?*

To summarise, it is analysed that SMEs follow a compromised mode of KA as they give more emphasis to knowledge exploitation with limited knowledge exploration. The stakeholders are the main source of knowledge, and knowledge exists in a tacit form. In SMEs, the impact of digital platforms for KA is also limited. Therefore, we argue that the prospect of retrieving the latest knowledge related to the industry seems limited for SMEs, which affects its economic sustainability (Fig. 1).

Methodology

A case study approach is followed in this study to understand the KA phenomenon in SMEs. Following a case study methodology provides tools for researchers to study complex phenomena within their contexts, and when the approach is applied correctly, it becomes a valuable method to develop theory, evaluate programmes and formulate interventions

Table 1 Case study details of selected SMEs

SME (Industry)	*Country*	*Annual Turnover*	*Participants—ID*
Company A (Structural Engineering)	India	< US$16 million	Senior Manager—P1 Manager—P2 Designer—P3 Detailer—P4
Company B (Transportation & Logistics)	India	< US$1 million	Manager—P1 Operations Head—P2 Logistics Officer—P3 Shipping Coordinator—P4
Company C (Shipping)	UAE	< US$1 million	Manager—P1 Logistics Officer—P2 Documentation-Head—P3 Line Manager—P4

(Hafiz, 2008), thereby providing useful insights (Yin, 2009). To gain a better understanding of the KA achievement within SMEs, this study follows an intervention-based multi-case-study approach.

Case Selection

The research sample group consisted of two SMEs based in India and one SME from the United Arab Emirates (UAE), as illustrated in Table 1.

According to the theory of ambidexterity, the success of KA largely depends on the participants in the organisation (Birkinshaw & Gibson, 2004). Therefore, we carefully identified employees from each SME who had digital proficiency. The participants were trained to use a digital tool to explore knowledge at their discretion and to exploit knowledge for organisational benefits. The digital tool was offered as a cloud KM service by IBM Watson (Watson, 2021).

Data Collection and Analysis

We introduced the digital tool to each participant in the case study SMEs. The digital tool codifies the newly identified, relevant and useful explored knowledge into explicit knowledge (called *knowledge articles*), which is also stored in the digital tool. The digital tool enables simultaneous access to knowledge articles for knowledge exploitation and exploration in SMEs.

We allowed all participants of the three SMEs to use the digital platform for the entire year of 2020 during the COVID-19 pandemic. An induction was offered to the participants on how to use the digital tool for achieving KA. On completion of the year 2020, semi-structured interviews were conducted, and video footage recorded to analyse the progress in their journey to be ambidextrous by using the digital tool. The interview data was then transcribed and uploaded to NVivo software for coding. Three rounds of coding were conducted, following the guidelines by Strauss (1987): open coding for identifying distinct themes for categorisation; axial coding for aligning the themes for identifying the relationship between categories and subcategories; and, finally, selective coding for integrating categories of organised data in cohesive expressions.

Findings

The findings are discussed in the three following subsections. The first subsection introduces the challenges faced by the three SMEs to achieve KA. The second subsection details, over the course of one year, how these SMEs successfully adopted the digital tool and co-developed coordination mechanisms for explorative and exploitative activities to achieve KA. The final subsection summarises the findings that portray how KA assisted in improving the economic sustainability of the SMEs during the prolonged crisis of the COVID-19 pandemic.

Challenges Faced by SMEs to Become Knowledge Ambidextrous

Our findings reveal that SMEs have the intention to become ambidextrous; however, the lack of knowledge regarding effective strategies/solutions, along with the wrong notion that IT is an expensive commodity, are the inhibiting factors. The exploration for external knowledge is found to be limited. SMEs continue to depend on vendors, suppliers and other stakeholders as sources of knowledge. Knowledge continues to remain in tacit form in SMEs, as they are generally not aware of the digital tools available to store different types of knowledge. There is hardly any common platform for interdisciplinary team coordination. SMEs largely rely on basic IT tools such as spreadsheets to store significant knowledge, which indicates that they see KM as part of content and document management. These challenges inhibit SMEs from becoming

ambidextrous, thereby jeopardising their ability to be sustainable. This finding is in line with the framework developed in this study from the literature.

> *…I use an excel sheet, which i save in my laptop to update knowledge… [P3.Company A]*

> *…we get knowledge about new trends from managers, as they have direct contact with external stakeholders, or customers and suppliers [P2.Company B]*

In What Ways Can SMEs Achieve KA Using Digital Tools?

Knowledge exploitation and exploration are not mutually exclusive (March, 1991), and the combination of these activities promote effective knowledge generation (Scuotto et al., 2019). By understanding this key point, the *first step* was for the SMEs to engage in knowledge exploration using the digital tool—for example, searching for the latest knowledge and trends in the market. Every SME created a list of queries to aid in their search for external knowledge as per their organisational requirements. Simultaneously, SMEs were guided to focus on exploitation of the explored knowledge for refining the current knowledge, so that they could utilise the knowledge effectively. The digital tool played a vital role in both processes, enabling SMEs to simultaneously follow both exploitative and exploratory learning strategies, so that failure or competency trap would not occur due to overemphasis on any one KA process.

Top managers were the key drivers in exploring knowledge or taking decisions related to explored knowledge. Hence, the *second step* involved giving every participant equal opportunity to explore and exploit knowledge using the digital tool. Participants could share the acquired knowledge and discuss how best to implement the explored knowledge. This ensured that, as more knowledge was accumulated in the firm, the SMEs could combat conflict issues of the exploration and exploitation process.

> *Watson helped us in searching various knowledge articles in my field of design. … Watson helped us to go through the existing knowledge articles and understand the different processes adopted globally… [P1.Company A]*

…it is now centralised knowledge … everyone can access anytime from any location in this COVID period. We had new learnings altogether' [P1.Company B]

From the findings, we can infer that the digital tool provides the SMEs with a foundation for knowledge exploration and exploitation. In fact, the digital tool provides every participant with equal opportunity to explore the KA processes and provides a robust knowledge base for leveraging KA. In this way, we can find validation in the notion that an effective digital tool can support the quest for achieving KA efficiently in SMEs.

Achieving KA to Improve Economic Sustainability of SMEs

To improve the economic sustainability of SMEs through KA, one of the main prerequisites that SMEs should fulfil involves acquiring an early understanding of market and technology changes in the heterogeneous knowledge context of the firm (Guo et al., 2020). Prior studies have proved that there is a direct link between the market orientation and economic sustainability of organisations (Crittenden et al., 2011). Hence, SMEs need to prepare for and find solutions to the problem and adapt to upcoming market changes. This is especially important in the context of the COVID-19 pandemic, where most of the participants were not prepared for the associated crises, such as disruptive markets, lockdown and continuous office shutdown. However, participants of Company A and Company C mentioned that they could explore market-related knowledge and new government policies/regulations through the digital tool to forecast changing demands.

During this coronavirus phase, which was new to all of us, we needed information and sufficient knowledge to sustain economically. … Watson assisted during this unprecedented situation. [P2.Company B]

…Watson give us a tool to forecast … make decisions … form strategy to tackle the upcoming challenges in the most economical and time-bound manner. [P1.Company C]

Organisations possessing a strong source of competitive advantage are more likely to survive and achieve superior performance (Edeh et al., 2020). As per prior studies, leveraging competitive advantage will

improve the image of an organisation and provide better services to customers, leading to higher sales and profitability, thereby enhancing economic sustainability (Presley et al., 2007). In many sectors, firms have tried to find the best combination of internal and external resources in order to grasp new business opportunities and efficiently utilise them to provide better services to customers and increase their competitiveness (Scuotto et al., 2019). The digital tool facilitates SMEs to develop such a combination, which will improve their competitive advantage. For instance, Company A mentioned that they were able to acquire the latest knowledge using the digital tool, which they integrated in their designs.

> *…structural engineering is a very dynamic industry. … We as a company closely monitor industry activities. … Watson helped us acquire such dynamic knowledge. [P1.Company A]*

> *Watson gives us information regarding the market updates. [P2.company C]*

The ability of firms to innovate is imperative for economic sustainability. Prior studies state that, to retain economic sustainability, firms should advise employees to innovate their perceptions regarding the efficiency of the products, services and technologies employed in their processes (Batista & Francisco, 2018). Innovation is nourished by the application of new knowledge (Cabeza-Pullés et al., 2020). The combination of exploitation and exploration activities generates knowledge for the firm that aids innovation (Scuotto et al., 2019). Our study emphasised that the integration of KA processes using a digital tool generates knowledge that aids SMEs in improving the rate of innovation in the organisation. Participants of Company A reported that, using the digital tool, they were able to find a variety of innovative threads that were useful to them. The key knowledge acquired using the digital tool could enhance the performance of the SMEs. For instance, Company B posted that the digital tool assisted them in exploring knowledge related to niche areas of their business sector that can foster economic sustainability.

> *…this [digital tool] really is an innovative idea … the design details of timber-based construction … we have decided that this idea should be included in our future… [P2.Company A]*

> *…when we looked into the details of various new areas through Watson, we understood that we had many newer things to learn. [P2.Company B]*

Hence, from these findings, we can posit that practicing KA can help in improving the capabilities of SMEs through generating knowledge related to market awareness, innovation and competitive advantage, facilitating SMEs to leverage economic sustainability, especially during crisis periods such as COVID-19.

Discussion and Contributions

Discussion

We analysed three case studies and found that the integration of a digital tool that supports KA processes can help to achieve KA in SMEs, thereby leveraging its economic sustainability during the COVID-19 pandemic. The case study SMEs followed a KM strategy to execute knowledge exploration (both internal and external) and knowledge exploitation to manage knowledge with the support of digital technologies, thereby achieving KA and eradicating knowledge scarcity. This implies that the digital tool can be a very useful enabler for SMEs towards economic sustainability. The digital tool encourages teamwork by providing equal opportunity for every participant to implement KA in the organisation.

Given our focus on the achieving of KA through digital tool contexts to leverage economic sustainability, we discuss several key findings. First, implementing KA using digital tools helped organisations to explore the latest market opportunity, forecast future challenges and make critical decisions during the COVID-19 pandemic. These findings go in line with J. Lee and Kim (2019), who emphasise that, for *survival and growing sustainably*, firms must simultaneously compete in existing markets and prepare to adapt to emerging markets as the environment changes. Second, KA supports SMEs in searching for and exploring the latest knowledge in their industry, while also facilitating the storing of knowledge in explicit form using these digital tools. During the COVID-19 pandemic, industry-specific knowledge is rapidly changing; hence, to stay competitive, SMEs need to generate new knowledge specific to their sector, since existing knowledge may not be sufficient for solving new problems. SMEs can either exploit the latest explored knowledge for refining their product/process/internal knowledge or leverage the

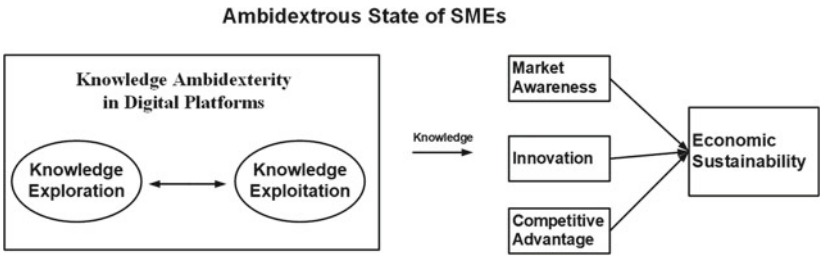

Fig. 2 Framework for economic sustainability through knowledge ambidexterity

personal knowledge of their employees to stay competitive. These knowledge sources can then prepare SMEs to face future challenges and leverage economic sustainability.

In a nutshell, our study implies that digital tools that support KM processes can achieve KA efficiently and leverage the economic sustainability of SMEs by improving capabilities in critical areas, such as identifying latest market-related knowledge and gaining competitive advantage. The themes that emerged from our findings aided us in updating our framework (see Fig. 2), emphasising that digital tools support the simultaneous execution of knowledge exploration and knowledge exploitation, generating relevant knowledge, which can be transferred and stored in explicit form. This generated knowledge facilitates market awareness, promotes innovation and provides competitive advantages to SMEs, thereby leveraging their economic sustainability.

Contributions

From a theoretical perspective, we contribute to economic sustainability and KA literature by overseeing and highlighting the perspectives of SMEs. For SMEs, sustainability is a bigger concern, especially during crises such as the COVID-19 pandemic. Our recommendation for SMEs to achieve economic sustainability is to implement KA with the support of digital tools. However, KA was unexplored and ambiguous in SMEs, and there are limited studies investigating how evidence-based research using digital tools aids KA in SMEs. The digital tool provides SMEs with a foundation for knowledge exploration and exploitation. Moreover, this study contributes to KA literature by following an intervention-based

case study analysis and strengthens the empirical findings by providing a framework for economic sustainability through KA in the SME sector with the support of digital platforms. To enhance economic sustainability, we emphasise that exploring and exploiting knowledge using digital tools aids SMEs in identifying the market change, searching for new business opportunities, integrating with internal knowledge for changing product/processes and identifying knowledge in niche areas of the business sector—all of which helps foster economic sustainability and combating business uncertainty.

Conclusion

In this study, we investigated how SMEs could achieve KA with the support of digital technologies to leverage economic sustainability. This study found that digitalisation enables KA within the SMEs sector towards achieving economic sustainability. We adopted an exploratory multi-site case study approach in SMEs over India and UAE. We introduced a digital platform that enables KA processes in these SMEs and captured evaluation data after the use of the digital platform for a year. Our findings revealed that limited knowledge exploration, tacit knowledge, lack of common platform for interdisciplinary team coordination and dependence of outdated Information Systems are the major hindering factors for achieving KA in SMEs. We also found that digital tool provides the SMEs a foundation for knowledge exploration and knowledge exploitation. Moreover, practicing KA can help in improving the capabilities of SMEs by the generation of knowledge related to market awareness, innovation and competitive advantage, facilitating SMEs to leverage economic sustainability. As a theoretical implication, our analysis contributes to the KA literature by following an intervention-based case study analysis and strengthens the empirical findings by providing a framework for economic sustainability through KA in the SME sector with the support of digital platforms.

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