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Technology for resilience amid COVID-19 pandemic: Narratives from small business owners in Kenya

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Abstract

The COVID-19 pandemic has changed many aspects of the economy. The situation has notably been more challenging for small businesses in developing countries which tend to operate with limited funding and a lack of social and human capital. In these contexts, technology has been argued to be an important resource to allow businesses to adapt and recover from the crisis. In line with this narrative, the pandemic has been linked to growing technology adoption within small firms in developing countries. However, little is known about how small businesses are using such technology as part of strategies: to survive, reposition themselves in the market and potentially ‘spring back’ from the pandemic to thrive in a fundamentally changed environment.

In this study, to fill this gap we look to the concept of resilience to examine how technology was adopted to help build resilience. The study focused on small businesses in Kenya and uses in-depth qualitative analysis to unpack the processes of adoption and use. The study findings suggest that the pandemic created an incentive for many small businesses to engage with digital technology, enabling them to stay operational. The study evidenced specific coping strategies that incorporated technology to support resilience, including exploiting demand, acquiring new capabilities, expanding existing capacities, making data-driven decisions, fostering social networks and freezing operations. Consequently, we argue for the need to unpack the processes of technology adoption and the links between technology and economic growth in such settings. During the pandemic, small businesses have typically adopted technology to build resilience appropriate to their context.

Keywords: resilience, small business, technology adoption

Introduction

The outbreak of COVID-19 has changed many aspects of the business community globally (Oldekop, et al., 2020), and rapidly evolved into one of the greatest economic crises of the century. The rapid and exponential spread of the pandemic forced governments to impose measures to contain the spread of the virus. Some of these measures including complete or partial lockdowns and social distancing amongst others have caused serious implications for businesses globally (Nicola (2020).

The situation is notably more challenging for small businesses in developing countries that typically operate with limited funding and a lack of social and human capital (Akpan, Udoh, & Adebisi, 2020). The longer-term effects of the pandemic, as it continues to impact, is that it threatens the functioning and viability of small businesses which are unable to cope with the unexpected challenges and have been forced to close (or significantly reduce their workforce) (Akpan, Udoh, & Adebisi, 2020; Ali, et al., 2021). Given that small businesses can contribute up to 40% of national income in developing countries, such measures can consequently have significant implications for the broader economy (Wellalage & Fernandez, 2019). Small businesses play a pivotal role through their connection with larger enterprises and their role in supply chains (Hamid, Ismail, & Uzi, 2021). Consequently, as governments implement policies, they need to consider the paralysis of small businesses that may cause significant ripple effects across the economy.

Information technology has been positioned as a key resource in supporting businesses to adapt and recover from the crisis (Herath & Herath, 2020). However, previous studies indicate that many small businesses make limited gains - they are either unaware or do not have the technical know-how and/or infrastructure to adopt the right technology (Amiri & Woodside, 2017; Akpan, Udoh, & Adebisi, 2020). This would suggest that information technology would lead to skewed impacts, with large businesses, which have invested in information technology, being able to better navigate the shocks (Herath & Herath, 2020). For example, well-resourced businesses may be able to facilitate their employees to work remotely in a secure digital environment so that productivity does not suffer so much as a result of containment measures. Nevertheless, literature on the crisis suggests that even with limited adoption, some smaller firms are discovering that the crisis presents opportunities. Small businesses have, in the wake of the pandemic, accelerated their digital transformation journey by re-aligning their businesses to embrace information technology (Papadopoulos, Baltas, & Balta, 2020).

A key concept that has been adopted in the literature related to strategies of information technology use during crisis has been the concept of *resilience* (Chatterjee, Chatterjee, & Chatterjee, 2021; Rai, 2020; Boh, Constantinides, Padmanabhan, & Viswanathan, 2023). Resilience, understood as the ability to withstand and recover from crisis, is important to allow us to think more systematically about a broader set of factors and strategies that shape firms during shocks and crises (Min, 2019; Alesi, 2008; Ali, et al., 2021; Al-Talib, et al., 2020; Ivanov, 2021; Gu, Yang, & Huo, 2021; Kamarthi & Li, 2020). Considering that studies on resilience have mostly focused on large firms (with specific attention to supply chains), a major contribution of this paper is an expanded understanding of resilience to consider how small businesses have repositioned themselves and might potentially ‘spring back’ from the crisis to thrive in a fundamentally changed environment and become better prepared to deal with future shocks. Previous literature on information technology and resilience has often focused on more systematic aspects of organizational information technology and information such as systems and client information and project management amongst others (Chatterjee, Chatterjee, & Chatterjee, 2021). In this study with a focus on small enterprises, we incorporate less familiar patterns of digital technology use that are more ‘frugal’ and appropriate to support various business operations in their contexts. These may include implementations and uses of information technology at a much smaller scale but they are nevertheless an important part of strategies of small business resilience (e.g. social media, mobile phones and information use).

Overall, the research objective of this study is: *to understand how small businesses can use information technology to become resilient during crisis*. We attempt to understand the opportunities and challenges offered by information technology and move further to suggest how small businesses might position themselves to exploit information technology post-pandemic. The study provides an understanding of the challenges and initiatives focusing on in-depth qualitative research on small businesses in Kenya and their efforts to preserve their performance, recover, and or prevent decline and even complete closure amidst the current pandemic.

In terms of contributions, by using the concept of resilience, the paper moves beyond more simplistic statements about the relevance of information technology for small firms during the COVID-19 crisis. It looks to ground these within the unique settings within which small businesses in developing countries operate, and the diversity of their business ecosystems. In an era defined by frequent economic crises, such research presents a compelling case to contextualize the use of information technology in helping small businesses develop resilience. Additionally, the study contributes to the call by Rai (2020) and Boh, Constantinides, Padmanabhan, and Viswanathan (2023) for more

research into how information technology may help businesses build resilience to pandemics and extreme events.

The article proceeds as follows. We firstly review the literature to build a clearer understanding of resilience, the impact of COVID-19 on small businesses, and information technology adoption. Secondly, drawing on a broader understanding, we examine information technology use based on qualitative research in Kenya. Building narrative, inductive accounts of such firms we highlight major coping strategies of firms such as 'exploiting demand', 'acquiring new capabilities', 'expanding existing capacities', 'making data-driven decisions', 'fostering of social networks' and 'freezing operations', that describe some of the key dynamics. Thirdly, in reflecting on the findings, we suggest that there is a need to consider small firms and information technology more carefully, where actions move beyond solely economic gain from information technology. The crisis should not only be seen as serving as an accelerant for the adoption of information technology. During the pandemic, small businesses have typically adopted technology to build resilience appropriate to their context.

COVID-19, Information technology and small firm resilience

The concept of resilience

Crisis and shocks, whether they be economic, organizational, or environmental are core disruptors of organizations. Although such shocks lead to firms experiencing significant challenges, they will experience these crises in different ways dependent on their capabilities, strategies, resources and contexts. The notion of *resilience* has therefore been placed at the center of organizational analysis of firm survival and recovery (Sutcliffe & Vogus, 2003).

There is no common definition of resilience in extant literature, with research coming from multidisciplinary origins. Typically, for business, resilience is seen as a multi-dimensional concept that focuses on the ability of an ecosystem to withstand shocks from disruptive events while maintaining function (Folke, 2006; Saad, Hagelaar, Velde, & Omta, 2021). Resilient businesses are considered as those that can react and recover from crisis with little effect on their stability and function (Linnenluecke, 2017). Such capacity to withstand and recover from a crisis requires resources and relevant structures that can enable the business to withstand the crisis or disturbance and eventually restore its earlier state. Linnenluecke (2017) additionally observes that such resilient businesses may be able to engage in transformative activities in order to exploit the current crisis that otherwise threatens their survival.

A useful starting point for the analysis of resilience is the recognition of two major areas of resilience research in a business context, firstly, *organizing for resilience*, which focusses on organizational capabilities and systems, and secondly on the *context of resilience* with a stronger emphasis on the conditions of crisis and

responses (Linnenluecke, 2017). In terms of *organizing for resilience*, classic organizational studies of shocks and crises suggest that “many well-publicized corporate collapses can be viewed as failures to alter response in the face of environmental change” (Staw, Sandelands, & Dutton, 1981, p. 20). This is particularly the case for those with organizations displaying well-established ideologies and rigidity that may leave organizations more vulnerable as conditions change (Meyer, 1982). For those who can better negotiate such crisis, the following organizational characteristics are common across studies and disciplines. Firstly, *responsiveness*, which outlines the ability of the organization to quickly identify, learn and react to changes within the business environment or the evolving market (Saad, Hagelaar, Velde, & Omta, 2021; Teo, Lee, & Lim, 2017). Secondly, *adaptability* which is concerned with adapting organizational resources, routines as well as processes in order to deal with the aftermath of a disruptive event (Barasa, Mbau, & Gilson, 2018; Saad, Hagelaar, Velde, & Omta, 2021). Thirdly, *competitiveness* which is the ability of organizations to deliver superior value in products and/or services compared with rivals in the market and to potentially gain during a crisis (Ali, et al., 2021; Barasa, Mbau, & Gilson, 2018).

The extent of disruption due to COVID-19 and the pressing demands small businesses have faced to adapt (as discussed in the next section), leads to a focus on how firms respond to crises in this paper (i.e., emphasizing resilience strategies over rigidity). Firms need to be responsive to build strategies that support those core characteristics of resilience (responsiveness, adaptability and competitiveness). Advice for business strategies has been broad, but might include approaches to *minimize vulnerability* (Alesi, 2008; Barasa, Mbau, & Gilson, 2018) through identifying and mitigating risks that reduce the possibility of being adversely affected by expected or unexpected changes within the environment. Strategies to *maintain positive performance* (Linnenluecke, 2017; Boh, Constantinides, Padmanabhan, & Viswanathan, 2023) during crisis are important and having measures in place to ensure consistency so that firms can continue to follow their goals and objectives over an extended period of crisis. Firms can also build capabilities to *seize opportunities* (Vakilzadeh & Haase, 2021; Boh, Constantinides, Padmanabhan, & Viswanathan, 2023) to have the agility to turn adverse circumstance(s) brought about by a disruptive event into an organizational opportunity. Such approaches to strategies, intuitively appear to offer wide-ranging categorisation to conceptualise small firm resilience strategies. Nevertheless, given that they, on the whole, emerge from studies of formal organisations they may require some further refinement.

In terms of *resilience contexts*, research on resilience is highly context-specific and varies considerably. Consequently, there may be different factors that inform the degree of resilience in different contexts. While this current study primarily focuses on the use of information technology to build resilience, the literature has pointed to other broader societal factors and resources that have

implications for business resilience. Societal factors such as government support (Chen, Wei, Li, & Wei, 2021; Kinsbergen & Molthof, 2022) have been attributed to helping businesses withstand shocks of disruptions. During disruptions, governments have often come to the aid of businesses by offering subsidies, and financial support to help businesses stay afloat as was evidenced during the COVID-19 pandemic (Ali, et al., 2021; Chen, Wei, Li, & Wei, 2021).

Organizational context might also add contextual conditions such as business policies, and prevailing market demands for commodities alongside the management's ability to steer the business during adversity have equally been considered crucial building blocks for resilience (Vakilzadeh & Haase, 2021; Staw, Sandelands, & Dutton, 1981). Given developing economies can be defined by significant social, political and economic challenges, such organizations contexts have also been evidenced to be key to impacting business resilience (Barasa, Mbau, & Gilson, 2018; Kinsbergen & Molthof, 2022). Both organizational forms and resilience contexts are shaped by the role of resources like technology, and finance as well as strong social networks both within and outside the organization in contributing to building business resilience (Rydzak & Monus, 2018; Tisch & Galbreath, 2018). Information technology resources will be discussed further in the context of small businesses in the next section.

Although evidence has pointed to the need for businesses to build resilience, there is less research on small business resilience though it is an emerging area (Wishart, 2018; Saad, Hagelaar, Velde, & Omta, 2021). Sporadic literature on this topic suggests that small businesses face numerous challenges during crises and are normally the least prepared (Ali, et al., 2021). Indeed, small businesses often operate in environments that are more sensitive to economic fluctuations, existing legislation, changes in information technology as well as changes in customer demands and even political instabilities (Ndiege, 2019). Challenges of shocks to small firms are exacerbated in developing countries. As a result, small businesses operating within such countries often get more affected compared to their counterparts in developed countries.

However, small businesses do have some advantages over large firms as they can be closer to customers, more agile and more efficient in their resource deployment. For small businesses, their agility is made possible by their reactive approaches to crisis, faster decision-making process, more effective and rapid internal communications, minimal bureaucracies, and flat hierarchical structures among others (Ali, et al., 2021; Wellalage & Fernandez, 2019) While small businesses could exploit their agility to their advantage, they often lack resources and capabilities to effectively do so (Wishart, 2018; Martin, Romero, & Wegner, 2019). Therefore, in addition to the adequate resources and structure, discussed above, small businesses require the ability to understand their prevailing circumstances and come up with appropriate responses that are sensitive (or situation-specific) to the present crisis and their capabilities. For small businesses to be resilient during crisis it is imperative that they

appropriately adapt and dynamically relate to their new environment. Without this, they may not be able to withstand and recover from crisis shocks.

The COVID-19 crisis and small businesses

The sudden onslaught of the COVID-19 pandemic that appeared in early 2020 is arguably the most disruptive crisis that society has faced in the last century. It has drastically changed the global society and the economic landscape. Thus, it is worth discussing the impacts of the crisis on small businesses in detail as its impacts may require analysis that moves beyond previous notions of resilience, discussed previously.

To help stop the spread of the pandemic, the need for social distancing has become the 'new normal'. The effect of the many measures undertaken by governments around the globe has redefined how people behave and interact in societies (Ratten, 2020). While this phenomenon has affected businesses globally, studies that have been specifically carried out on small businesses so far indicate that these businesses have been significantly affected by the current pandemic compared to large firms (Ali, et al., 2021; Papadopoulos, Baltas, & Balta, 2020; Juergensen, Guimón, & Narula, 2020; Reddy, et al., 2022). It is worth noting that this research on small firms has tended to focus on more developed economies and hence we still know little about the impact of COVID-19 on small businesses in developing countries.

While the long-term social and economic implications of the pandemic are difficult to predict, it is already becoming apparent that it has brought unprecedented challenges in developing countries to the typical ways of doing business. Small firms in developing countries have traditionally survived through their ability to build face-to-face connections. The limits of such models that require connection have been disrupted as small businesses continue to experience the effects of the lockdowns (and the extended reluctance of customers to engage in face-to-face activity). The outcome of this has been a decline in customer base, a scaling down on the number of workers due to reduced income and operations and in some cases a complete shut down for those unable to transition their operations online (Juergensen, Guimón, & Narula, 2020; Ali, et al., 2021; Reddy, et al., 2022). In instances where lockdowns have been fully or partially lifted, many small businesses are still unable to resume their operations due to their inability to meet the new business requirements where they incorporate epidemic mitigation measures into their activities (Lu, Wu, Peng, & Lu, 2020). Even when measures become less onerous, once small firms suspend operations, employees may rapidly move on, and with potential financial obligations remaining, it may simply not be viable to reopen.

Even before the crisis, small businesses have long been characterized by a number of challenges including scarcity of resources, and a limited skilled workforce amongst others. These traditional challenges have worsened due to the extent of the current crisis. Given disruptive implications, governments mainly in developed countries, have offered some financial support, subsidies or other measures to the affected small businesses. In developing countries, large-scale schemes have been less common, but there is a growing demand for governments, donors and support organizations to incorporate measures for small businesses into their plans. Notwithstanding the broader challenges faced, insight may come from research highlighting small businesses who have exploited the crisis to their advantage by re-inventing themselves through the introduction of new product or service lines and embracing information technology for survival (Akpan, Udoh, & Adebisi, 2020; Ali, et al., 2021).

Information technology adoption and resilience during the COVID-19 crisis

COVID-19 has significantly accelerated digitization in all sectors (Oldekop, et al., 2020; Klein & Todesco, 2021). Given that the virus spreads significantly through physical contact, online interactions, communication and transactions have rapidly gained prominence and relevance for many organizations. However, while the rapid growth of digital technology by businesses has been observed, it is important to unpack this 'black box' to understand more conceptually the changing pattern of use, particularly for small firms in developing countries (Gkeredakis, Lifshitz-Assaf, & Barrett, 2021).

Generally, the adoption of information technology by small businesses has been low compared to large firms which normally have the resources and abilities to easily adopt and exploit technology. Additionally, while there exists some level of awareness of the need and benefits of information technology adoption for businesses in developing countries, there is little action towards implementation (Owusu-Agyei, Okafor, Chijoke-Mgbame, Ohalehi, & Hasan, 2020). For small businesses in developing countries, bottlenecks are not solely about a firm's resources and skills, unfavorable political and economic environments also make it more challenging for them to fully embrace information technology (Ndiege, 2019; Shaikh, Kumar, Syed, & Shaikh, 2021). Due to these prevailing systemic challenges, many small businesses, more so those in developing countries, may struggle to embrace information technology or do so in more limited ways in comparison to medium and larger firms (UNCTAD, 2020).

Nevertheless, given the impacts of the COVID-19 crisis, it has pushed adoption and use. Small businesses have been reported to shift their operation online to overcome challenges, discussed above, that were brought about by the COVID-19 pandemic (Ting, Carin, Dzau, & Wong, 2020). The adoption of information technology became a survival mechanism for businesses during the lock-downs

that were imposed by governments to contain the spread of the COVID-19 virus. Small businesses have been able to utilize or expand on information technology use such as digital payments, Zoom for remote meetings and social media platforms to conduct and sustain their business (Kumar & Ayedee, 2021; Klein & Todesco, 2021). The adoption of such information technology might then facilitate the rapid shifting of business practices to new digital spaces thereby enabling business operations to continue or allowing firms to pivot into new areas or models.

While there have been advances in information technology, there has been slow uptake of such state-of-the-art technologies due to associated costs, and lack of or limited knowledge on the existence of such technologies and the potential benefits that such new technologies could offer to small businesses (Akpan, Udoh, & Adebisi, 2020). As a result, many such businesses more so those in developing countries have continued to rely on more 'frugal' digital technologies like social media (e.g. Facebook, WhatsApp), Mobile phones (and related applications like mobile money transfers), and websites (Papadopoulos, Baltas, & Balta, 2020; Ndiege, 2019). Information technology capabilities that allow businesses to learn, build collaboration (through social networks) and help improve the effectiveness and efficiencies of their processes are imperatives to building resiliency in businesses (Chatterjee, Chatterjee, & Chatterjee, 2021; Boh, Constantinides, Padmanabhan, & Viswanathan, 2023). Many businesses that exploit digital technologies offering such possibilities potentially build their resilience during crisis (Alesi, 2008; Gkeredakis, Lifshitz-Assaf, & Barrett, 2021; Herath & Herath, 2020; Boh, Constantinides, Padmanabhan, & Viswanathan, 2023).

Therefore, it may be argued that the current COVID-19 crisis has pointed small businesses towards the importance of investing in digital technologies. These are becoming necessary in the emerging 'digital economy' not only to support activities such as selling and marketing their products and or services remotely but also as part of broader patterns of firm digitalization to increase their internal efficiency as well as productivity in addition to expanding their traditional market base (Graham, 2018).

Summary

Bringing this discussion together into a more systematic approach to considering crisis (COVID-19) and small firms in developing countries (as shown in Figure 1). This work draws in major directions from organizational theory and models of organisational resilience serve as an underlying approach to building a more expansive framework to conceptualize the activities of firms in crisis. These are relevant to examining COVID-19, although it is important to acknowledge that the extent of this crisis may require actions that move beyond typical

understandings of resilience. Small firms face particular challenges in terms of resilience given their character in developing countries. One approach to overcoming challenges has been the adoption of information technology, which can support specific firm strategies to build resilience. However, the formal organizational skew of existing literature suggests further work is needed to better understand how firms look to build resilience and survive during crisis.

Based on this discussion, the research model that orientates this study considers the different aspects of resilience at its core. We specifically focus on the ability of technology to help small businesses become resilient. This is done, in line with the literature, by seeking to track how technology facilitated various coping strategies that enabled them to build resilience. As shown in the model broad categories of coping strategies have already been outlined in the literature, but they might underplay specific actions with small businesses in developing countries. Thus, these need to be unpacked and considered within the context of this study.

Given the evolving nature of the pandemic and the fact that its effects are still being experienced this study excludes the growth component of resilience. Additionally, growth is an outcome that would occur as a result of the deployment of certain strategies while our interest was in how information technology is used to support those strategies.

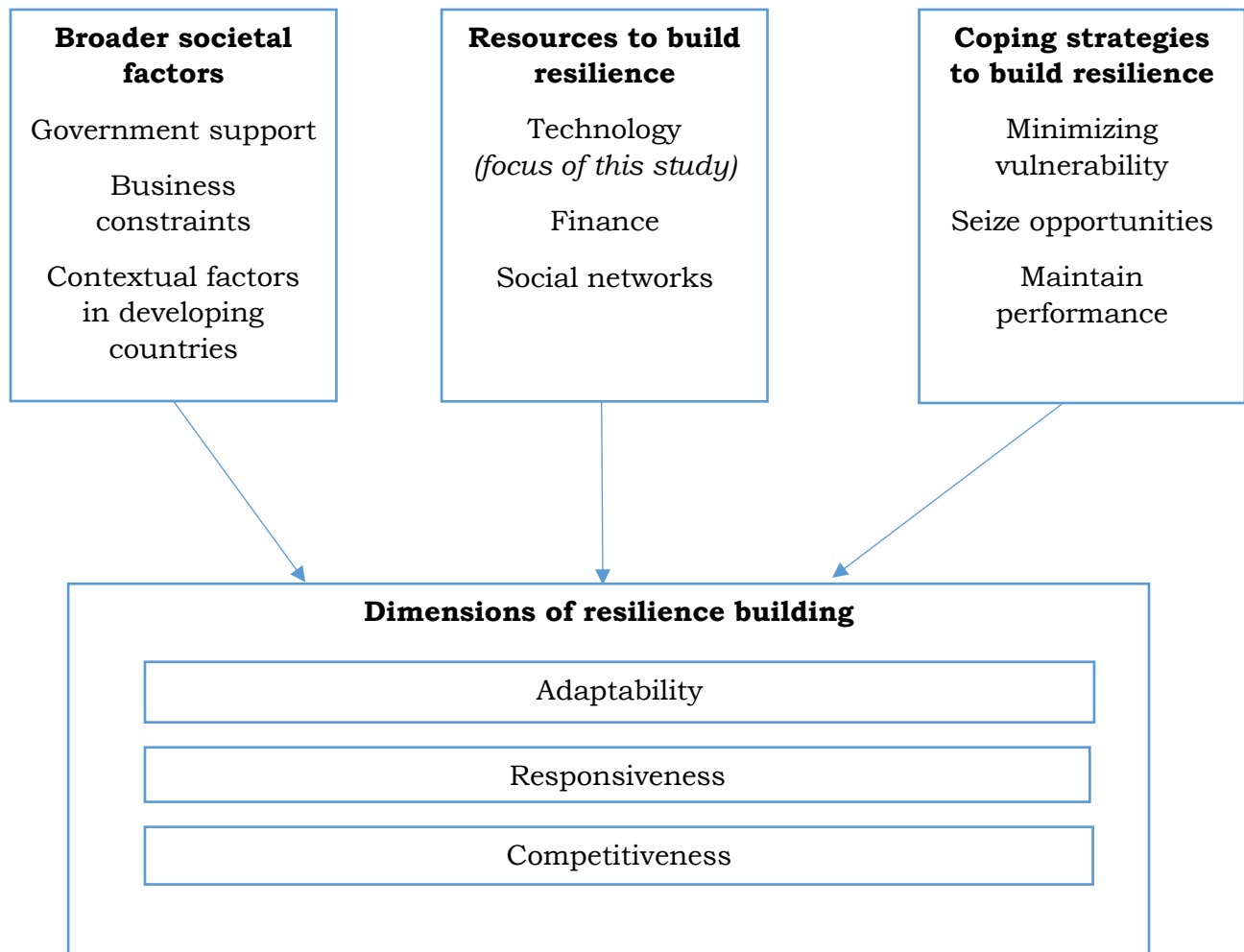


Figure 1: Framework to consider resilience responses within crisis and small firms
 Source: Authors elaboration based upon literature review

Approaches to examining small firms, information technology and crisis

Small firms and the COVID-19 pandemic in Kenya

The crucial role the small businesses play in the economy of Kenya is underscored by their inclusion in the country's flagship Vision 2030 which seeks to transform Kenya into an industrialized middle-income country by the year 2030 (Kithae, Gakure, & Munyao, 2012). According to the economic survey of 2021, small businesses contribute over 70% of the country's GDP and employ over 80% of the labour force (Kenya National Bureau of Statistics, 2021). Yet, despite the critical role played by these enterprises they continue, in line with the broader literature, they face challenges such as inadequate funding, and lack or minimal support for their entrepreneurial pursuits among others.

While it might be too early to predict the full socio-economic impact of the COVID-19 pandemic on the Kenyan economy, such firms face many additional challenges. At a macro-level, the adverse impacts of global financial markets and disruption of the global supply chains have impacted the Kenyan economy. Within the country, directives by the Kenyan government during the crisis, such as enforcing the closure of bars and restaurants, alongside the ‘down-to-dusk’ curfew, have been necessary to slow the spread of the virus but with negative economic impacts (Noor, 2020; Muthuri, Jain, Ndegwa, Mwangandi, & Tagoe, 2021).

The Kenya National Bureau of Statistics (KNBS) has undertaken a tracker survey to understand the impact of COVID-19 on small businesses (Kenya National Bureau of Statistics, 2021). According to this survey, 61% of small business households missed meals during the period of lockdown (April – July 2020). The study reveals that 20% of these businesses had completely closed down by March 2021 due to reduced demand and government containment measures. More optimistically, 77% of the businesses survived through the lockdown period in 2020 suggesting firms might be able to build resilience and survive. One important measure to support such firms is that the government has put measures in place, including provision for bank loan restructuring and waiver on Value Added Tax. However, these may have had a limited impact on some small firms. The survey suggesting 73% of small businesses had not benefited from such support.

While this report highlights a few challenges faced by small businesses in Kenya during this pandemic, it also indicates that small firms are turning to information technology to help them remain resilient. The KNBS survey, for example, reported that 26% of small businesses had an increase in customers making digital payments and a number of small businesses also resort to digital channels like phone calls, social media and online stores to reach their customers.

In sum, the suggested adoption and impacts of information technology amongst small firms in Kenya provide a useful case to examine questions about crisis, information technology and small firms. Detailed analysis of how such firms have been able to adapt their businesses using information technology during the pandemic can provide insights into the research question of this paper.

Approach

Due to the exploratory nature of the study – to unpack the processes of resilience within small firms in Kenya – a qualitative approach was adopted. In line with more inductive approaches to research, the literature here provides a starting point for study, notably on organizational resilience strategies as enabled by technology (as introduced in Figure 1). We use these theories as a ‘sensitizing

device', adopting a degree of openness in our collection and analysis of field data, in line with inductive approaches (Walsham, 1995; Klein & Myers, 1999). This is particularly important in the contexts of developing countries where the major theorized accounts (such as the patterns of coping strategy and types of technology used) may be poorly fitting to the realities of research with small businesses.

This research seeks to support a more in-depth explanation of how the small businesses in Kenya are affected by the pandemic, and how they are navigating through the shocks by embracing information technology (Yin, 2018; Grønmo, 2020). Therefore, the intention of the qualitative work is not on producing a statistical representation of small firms, but rather on focusing on building a "thick description" of the experiences of a limited number of small firms in terms of their COVID-19 and technology (Yin, 2018). The sampling of firms, in this case, emerged based on ongoing analysis of themes, categories or explanations around the data being collected (Groenland & Dana, 2020). The saturation point was reached at 15 participants with limited insights being brought in by additional participants. In total 20 participants participated in this study representing 20 small businesses. The study takes a cross-sectional view rather than an industry view in order to present a more comprehensive assessment and also shed light on practical and theoretical implications for small firms in different sectors. Future work might augment these more exploratory findings through more detailed sector-specific studies.

The data was collected through in-depth semi-structured interviews with the small business owners (or in some instances their representatives). The interview questions were structured, in line with the literature review, to consider strategies that the small businesses employed to survive the shocks of the pandemic and more specifically attempted to understand how information technology was used to support those strategies. In this study we adopted Kenya's official definition of micro-enterprises in selecting firms, that is, a focus on enterprises with less than 9 employees (Kenya National Bureau of Statistics, 2021). Small firms were sampled based on them having adopted some form of information technology before or during the pandemic.

Given this research was carried out in the midst of the crisis, online Zoom meetings were used as the major source of interviews to comply with social distancing rules and directives issued by the government of Kenya. The interviews were conducted in August 2021. The timing of the interviews was particularly important as most businesses had started feeling the impact of the pandemic on their businesses. As such the research represents a unique set of discussions with businesses in the midst of figuring out how to use information technology at the height of the crisis. The Zoom meetings were recorded with consent from the research participants. Borrowing from phenomenological

studies, interviews also had a more action-focused orientation, where the interviewers (as information systems experts) also provided advice and guidance to interviewees on approaches to recreate their business during the pandemic (Armour, Rivaux, & Bell, 2009).

In terms of analysis, the interview data was subjected to individual case analysis, as well as cross-case analysis to increase reliability (Yin, 2018). The coding categories used were drawn from the theoretical framework (see Figure 1) and the literature review. Frequency counts and thematic analysis were employed as analysis methods to address the study objective. Following the interviews, the co-authors individually interpreted the statements transcribed from the recording and categorized them starting with higher-level themes and then drilling down into sub-themes using thematic coding. These themes and sub-themes were then identified jointly by the co-authors to form the study findings.

Information technologies and resilience in Kenyan enterprises

In this section, we begin by presenting the demographic details of the participating small businesses in Kenya. Key findings are presented as a set of common ‘coping strategies’ that were adopted and implemented using information technology. To aid in this presentation, selected verbatim responses from the interviewees are used to explain the findings further.

Overview

To characterize the sample used in this study, basic demographic results are presented in Table 1. The small businesses that participated in this study were drawn from different industries. This ensured greater representation. Of the 20 small businesses that participated in this study, 11 were from an urban setting while 9 were drawn from a rural setting. The small businesses were drawn from different types of business: Training (2); Agribusiness (5); Retail shop (6); Dairy farming (3); Poultry farming (1); Advisory services (1); Food services (1); and IT industry (1).

Table 1: Demographics of the small businesses

Enterprise code	Years in operation	No. of employees	Business type	Where situated (Urban/Rural)
SB1	3	5	Educational training	Urban
SB2	6	3	Agribusiness	Urban
SB3	5	2	Agribusiness	Rural
SB4	8	2	Retail shop	Urban
SB5	13	4	Dairy firm	Rural
SB6	3	2	Dairy firm	Rural
SB7	2	4	Dairy firm	Rural

SB8	6	1	Poultry business	Rural
SB9	4	5	Agribusiness	Rural
SB10	3	3	Retail shop	Urban
SB11	10	1	Advisory services	Urban
SB12	4	8	Agribusiness	Rural
SB13	2	1	Agribusiness	Rural
SB14	4	3	Retail shop	Urban
SB15	5	3	Handcraft Training	Urban
SB16	1	1	Food services	Rural
SB17	5	1	Retail shop	Urban
SB18	10	4	Retail shop	Urban
SB19	4	3	IT industry	Urban
SB20	6	2	Retail shop	Urban

In terms of pandemic experiences, we found that the pandemic led to both opportunities and constraints in the surveyed small businesses. The extent of the opportunities and constraints however did vary from one enterprise to the other.

For some enterprises, the pandemic is presenting challenges that are inhibiting their sustainability while for others new opportunities are emerging. The lockdowns and social distancing measures introduced new barriers to doing business and some enterprises opted to close business indefinitely. The study findings however identify several common coping strategies that were adopted by the small businesses that participated in the study which enabled the enterprises to remain resilient. Of particular interest to this study were coping strategies that were enabled by information technology.

Coping Strategy 1: Exploit demand

The pandemic presented new opportunities that some small businesses were quick to exploit. While the containment measures such as curfews, lockdowns and social distancing meant there was limited or no movement of persons, the changed environment led to a growing number of consumers going online to shop and opting for home deliveries.

This presented new business opportunities in which small businesses were pushed to transition into new business models in order to survive. For those who already had an online platform, they had to embrace doing home deliveries. SB14 expressed this strategy:

“...after we started our Facebook page more people started inquiring about how they could get our products...before we only sold clothes but many people started asking about beauty products too...so I had to stock them...package and arrange for delivery for them because not many people could come to the shop”

The use of this strategy was also corroborated by SB19 which was an information technology firm providing information technology solutions and services to small businesses. They observed that:

“Being an IT service business the COVID-19 provided an additional boost compared to other businesses. While others were on pause, we were working more. We mostly used our social media platforms to interact with customers and mobile phones to engage with them remotely.”

As evidenced in these quotes, small firms may not necessarily be using a single dedicated platform or e-commerce site, but as demand grew for online interaction they were agile enough to string together different resources and information technology to serve these customers.

Coping Strategy 2: Acquire new capabilities

Using technologies to acquire new capabilities was an important strategy adopted by small businesses. Building capabilities around technologies can support adapted and improved business models during the crisis.

SB1 for example while previously used to conduct physical workshops was able to develop skills to use virtual video platforms such as Zoom to deliver them online.

Other small business that already had an online presence modified their platform to accommodate ordering items online to ensure that the products could be ordered and delivered at the convenience of the customers. For example, SB16 observed:

“...this is a very bad time for us, many of our products are sold by hawkers and people were commuting less because of the Covid-19 restrictions. We had to shift our focus from selling products to commuters to home consumptions because more people stayed in their homes so we had to create online platform where people could order directly and we deliver using ‘boda boda’ [motor cycle riders]”

As the examples show, in Kenya digital platforms and associated resources are available (infrastructure for video conferencing, delivery platforms etc). For businesses, building capabilities is about the way they can integrate these technologies into their everyday business practices.

Coping Strategy 3: Expanding existing capacity

While the general trend experienced by the majority of businesses during the pandemic was the scaling down of business operations, it was noticeable that there were instances where some small businesses experienced a surge in demand for certain products or services.

That necessitated the need to scale-up the production of such products or the provision of the demanded services. One of the businesses observed that:

“...some people closed but when we started using the social media for the business I had to even work more because the demand for people ordering for things online increased...before COVID I was not using Facebook for my business” [SB10]

A similar strategy is equally well demonstrated by SB14 as captured under Coping Strategy 1. This demonstrates that the use of technology, facilitated small businesses to expand their operations during the pandemic.

Coping Strategy 4: Data-driven decisions

Managers of small businesses appreciated the need for making decisions that are supported by data. For example, some coping strategies adopted by small businesses (such as new product lines, or scaling up or down of certain operations) were never blindly made but were supported by information.

In most cases, the source of data comes from conversations or comments on social media platforms but in a few instances the information relied on was from the public sector. SB6 who does dairy farming described this process as follows:

“...the County government would send some information on their website. So before I decide on what to do regarding getting the animal feeds I would see what new information is there because sometimes they would be providing the feeds at subsidized price...that information is very important to me in deciding what to do next”

Such a course of action was also demonstrated by SB20 who owned a retail shop. For her, it was using her social media platform to know what kind of items were being demanded by her customers. Hence, she would proceed to stock them. For SB19, it was complaints from customers on social media pages that made them change their processes in terms of how fast they would respond to market changes and what was demanded by their customers.

Coping Strategy 5: Fostering social networks

The use of information technology was also exploited by small businesses to foster the growth of their social networks and build business communities which were vital during the pandemic. The businesses used mainly WhatsApp groups to form and grow their social networks. Through these they were able to share their day-to-day experience with regard to how they were coping as was observed by SB9:

“We had a WhatsApp group with other farmers. We could share our challenges, learn how our colleagues are doing and managing...it was great

and comforting knowing that you are not alone. I learnt how one of the farmers was able to start rearing chicken and sell these in the neighbourhood.”

The social networks created also offered some form of assurance to the small business on the decisions that they needed to make. From the online conversations, they were able to build ‘wisdom of the crowd’ that in some instances became key in making certain determinations on actions to take or avoid. SB16 expressed this as follows:

“We have this WhatsApp group called ‘marisha biashara’ [boost business]. From there we would chat on where to get good quality items for our businesses...so sometimes you find many members saying don’t go to that supplier they have bad prices and poor quality things. So I only go where most members have had good experience...”

Consequently, the building of social networks through technology become one of the practical strategies that small businesses embraced to help them deal with the effects of the pandemic and hence remain resilient.

Coping Strategy 6: Freeze operations

One of the coping strategies that was adopted by the SMEs that participated in the study involved the freezing of some of their operations. This was done to help minimize the operational expenses as was observed by SB5:

“Money was not coming in...we had to reduce the production of farm feeds. We were only able to supply to a few customers now”

In some cases, the freezing of operations was done as a reaction to the diminished consumer demands for the products or services. SB8 notes that:

“...we had to reduce the supply of our poultry since people were no longer coming to the market to buy the way they used to before this pandemic...”

While in other coping strategies information technology would have a well-defined role on helping business expand their operations, freezing operations do not require substantial technological use. However, findings revealed that this coping strategy was in some cases supported by technology as demonstrated by SB7:

“Since we reduced the number of workers because there was very little work, I had to depend on technology [mobile phone] to communicate with most of my clients since people who used to do the field work were no longer working”

On the role that technology played to help the small businesses freeze their operation, we noted that the use of social media platforms was critical in helping the small businesses to identify a more focused small niche for their few products following the freezing of certain operations. For example, SB8 state that:

“Through my social media platform [Facebook] I was able to identify and connect to people within my County who I could easily sell to since we could not travel far because of the lockdown...we had reduced our activities so my Facebook become very handy”

Looking across these narratives, Figure 2 provides a summary of the various digital technologies that were adopted by the small business to support their coping strategies during the pandemic, illustrating the significance that digital technologies have played as a response to the crisis.

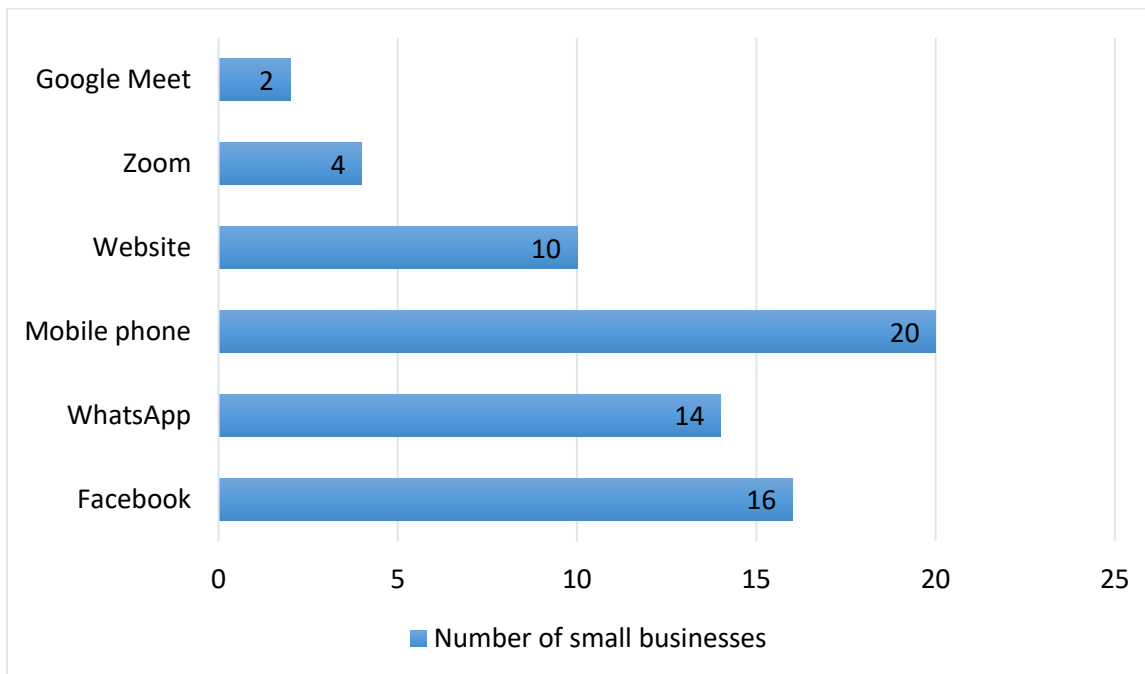


Figure 2: Summary of major technologies adopted by small businesses (n = 20 firms)

From the small business that participated in this study, mobile phones, Facebook and WhatsApp were the mainly embraced digital technologies to support the various coping strategies that were adopted by the business. This might have been because such technologies are readily available and accessible as SB20 observed:

“...it was a lot simple to create a Facebook account for my business since I have been using it for so many years now and most of my customers also have Facebook so it was easy to reach them”

In sum, across all these coping strategies we highlight that businesses rarely had prior plans or strategies in place to deal with disruptive events such as the one that the COVID-19 pandemic presented. They were able to adapt, but potentially more strategic planning could be used to build resilience.

Discussion

The findings of this study builds on the arguments presented in the literature review that during the COVID-19 pandemic, the activities of business were affected globally. This is even more so for those small businesses within developing economies that traditionally operate within resource-constrained environments characterized by unfavourable economic and political circumstances. With the various measures taken by the government to contain the spread of COVID-19, businesses can respond to disruptive events in different ways. Some small businesses had little potential to survive. Others might consider restructuring their current business routines and processes, while some might opt for a reduction of their outputs (Linnenluecke, 2017; Boh, Constantinides, Padmanabhan, & Viswanathan, 2023). The bottom line is that the way a business responds will determine its ability to have a business model that will strategically position it to be resilient and overcome the aftermath of the disruptions.

Additionally, the work contributes to the proposition by Ratten (2020) that the implications of the COVID-19 pandemic should be appreciated in light of the various digital transformations that have been experienced. To survive the shocks of the pandemic, several small businesses embraced coping strategies that were supported by information technology (Akpan, Udoh, & Adebisi, 2020). While the literature review highlighted some examples where information technology is relevant, arguably, our study demonstrates the *critical role* that technology played in helping small businesses remain resilient during the current pandemic. While the extant literature evidenced the slow pace at which small businesses were embracing the use of information technology in developing countries (Chege & Wang, 2020), the findings of this study demonstrate that the appreciation of the role of information technology in building resilience is not just a preserve of big business or those with sufficient resources but small business operating in unfavourable environments have found solace in technology during disruptions.

As demonstrated in Figure 2, the majority of small businesses opted for simple communication and social media platforms (such as Facebook and WhatsApp) to support the coping strategies they had embraced in order to keep their businesses running. Such frugal solutions are normally considered low-cost and require less learning as many business owners were already using them long before the pandemic. That might help explain the quick adoption of such

solutions to their businesses. Existing familiarity with the technology allows for immediate adoption and use enabling the business to quickly react to the pandemic shocks as they might not have the luxury and resources to learn (Gkeredakis, Lifshitz-Assaf, & Barrett, 2021). This work did not evidence the adoption of state-of-the-art technologies like cloud computing, internet of things (IOT) or blockchain technologies. Lack of adoption and use of more advanced digital solutions does challenge small business operations during crisis such as the COVID-19 pandemic (Akpan, Udoh, & Adebisi, 2020).

These patterns of technology use highlight the traditional digital inequalities that characterize small businesses in developing countries. It was evident that the small businesses that participated in this study did not always adopt the 'textbook' technological solutions. Rather their technology solutions were those that they were able to string together, were cost-effective and frugal. For example, while social media platforms can be ill-suited to some aspects of businesses, they can provide cost-effective and widely used platforms that firms can take advantage of to interact and build relationships with customers. In some cases, the assertion by Gkeredakis, Lifshitz-Assaf, and Barrett (2021) that disruptive events expose digital disparities between different business entities remains true. The ad-hoc use of frugal and ill-suited technologies may be limiting to businesses. Nevertheless, this use is often still of value for small firm resilience.

Additional cross-cutting coping strategies around the use of information technology to self-organize was an interesting finding from this current study that could be better integrated into resilience models. While communication and exchange of ideas through social media platforms may not lead to direct economic gains, it has crucial indirect effects. Building resilience collaboratively might suggest small businesses draw from the societal norms or traditions that advocate for the marshaling of communal resources to fight adversities (Hod & Ben-Zvi, 2018). Duncombe and Heeks (2002) further observe that information obtained through social networks might be considered more dependable as it originates from familiar sources. Such information is more likely to be relevant to the local context as it can be specifically contextualized.

In terms of planning coping strategies, during disruptive events, there is a need for quick actions or decisions with little pre-planning with small firms. The short and long-term ramifications can be evaluated later. Previous business research would suggest a more rational approach in crisis in terms of considering the logical and rational approach to decision making (Liu, Shankar and Yun (2017)). However, this kind of approach was not realistic in general for the COVID-19 pandemic, and even more so for small businesses. They were racing against time to ensure their businesses survive the shocks of the pandemic. There was a need for rapid yet fairly well-informed actions. This study evidenced the use of information technology like social media platforms to provide timely

information that enabled the businesses to take informed action bolstered by the wisdom of the crowd in some cases through their WhatsApp groups.

We highlighted three main categories of coping strategies in the literature review i.e. minimizing vulnerability, maintaining performance, and seizing opportunity (see Figure 1). Our inductive research finds that the technology supported six coping strategies that were adopted by the small businesses that participated in this study are subsumed within the three as depicted in the Table 2. The linking of the strategies are based on the narratives provided by the small businesses.

Table 2: Linking the technology supported coping strategies with the traditional strategies

Technology supported coping strategy	Associated broad categories of coping strategies		
	Minimize vulnerability	Seize opportunity	Maintain performance
Freeze operations	✓		✓
Fostering social networks	✓		✓
Data driven decisions		✓	✓
Expanding existing capacity		✓	
Acquire new capability		✓	
Exploit demand		✓	

As depicted in Table 2, we see the small business having embraced the broad categories of coping strategies albeit in different forms appropriate to their context (Barasa, Mbau, & Gilson, 2018; Linnenluecke, 2017; Boh, Constantinides, Padmanabhan, & Viswanathan, 2023).

This study also revealed the absence of a prior well thought out plan that the small business could use to deal with the shocks of the pandemic. Ndiege (2019), argues that small businesses lack the relevant skill to drive long-term proactive strategies. This leaves small businesses in constant firefighting mode when faced with a sudden disruptive event. Given this, we argue that the resilience within the small business was more adaptive than planned. Additionally, while this work looked primarily at the use of digital technologies by small businesses in developing countries to support the coping strategies they had embraced, we nonetheless would want to emphasize the need to consider the broader societal factors such as government support, the business constraints as well as contextual factors in developing countries in informing various dimensions of resilience.

Limitations

Despite the contributions made by this study, just like any other study, it does come with some precautions and certain inescapable compromises that must be

acknowledged. By choosing a single case of Kenya as the context of this research there may be concerns about its' generalizability. As a result, applying the findings from this work in other countries may be problematic as different countries might have different socioeconomic and political conditions. However, the findings are transferable to other developing countries with similar settings. Additionally, this study has limitations that tend to be common in many exploratory studies, such as the small sample size that resulted from the use of 20 small businesses. While we did reach a saturation point with the findings, there is the likelihood that the findings may not comprehensively represent the population; consequently, the ability to generalize the findings presented in this study may be limited. Nevertheless, the findings of this study are relevant in laying the foundation upon which future studies can interrogate other aspects of how the COVID-19 pandemic and other disruptions affect the small business community.

Conclusions and Future recommendations

While the quest to understand the full ramifications of the COVID-19 pandemic on small businesses has begun in earnest, the full understanding might not be straightforward. This is due to the emergent nature of the pandemic, the varying levels of preparedness and contextual differences surrounding the environment within which the small business find themselves. Nevertheless, with the prospects of future pandemics and other climate, political and environmental crises, considering how small firms react and use information technology is vital in providing policy-relevant knowledge.

Additionally, while there has been evidence in the extent literature regarding the role played by technology in helping organizations achieve resilience, little has been documented on how small businesses could use information technology to build resilience during crisis such as the current COVID-19 pandemic. This study contributes to bringing an understanding of how such businesses can use information technology to reposition themselves and spring back from a disruptive event. Equally, this work contributes to creating an understanding of the effect the pandemic has had on small businesses with special attention to developing economies like Kenya. The study presents findings on how information technology was used as a potent weapon to help small businesses remain resilient amidst the COVID-19 pandemic.

The lockdown and other restrictions that have been put in place to control the spread of the COVID-19 pandemic created a rare opportunity for many small businesses to engage with digital technology, enabling them to stay operational and in some cases access new markets. Consequently, we have witnessed the pandemic serving as an accelerant for the adoption and use of information technology by the small business community. Even more importantly, there were

new entrepreneurial opportunities presented by technology that offered new areas of growth.

In considering the results of this study, it was apparent that our findings would be valuable not just to the small business in resource-constrained environments and scholars in this area but to policy makers keen on the formulation of policies empowering small businesses to better strategically position themselves during disruptive events. Furthermore, these findings can be an interesting source of benchmarking that practitioners can use to enhance their understanding of the use of information technology as a coping mechanism for small businesses. To this end, technology is viewed as a tool that such businesses can use to rethink their business models and operation and be better positioned to face current and future crises. While the pandemic called for small businesses to be nimble, flexible and fast much might not have been achieved in terms of resilience in the absence of information technology.

Equally, the various coping strategies facilitated by information technology which enabled the small business to be resilient during the COVID-19 pandemic can inform the traditional quantitative analysis in which researchers can consider factors to include or exclude from statistical models.

In closing, we echo and build upon the recommendations by Wishart (2018), who note that, there is a need for further understanding of resilience within the unique settings of small businesses and also considering their geographical locations. While it's nearly impossible to plan for disruptive events, we encourage small businesses to embrace information technology as a tool to help them build and sustain resilience during such events.

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