Digital Technology Adoption Among Philippine Micro-, Small-,and Medium-Sized Enterprises: Barriers, Enablers & Challenges During COVID-19

Ian Benedict Mia*, Shieradel Jimenez, Raymund Habaradas, Jessica Jaye Ranieses, Cholo Javier and Jelica Enriquez**

ABSTRACT

The COVID-19 pandemic has forced Philippine micro-, small-, and medium-scale enterprises (MSMEs) to undergo some form of digitalization to survive and continue servicing clients' needs. Many MSMEs failed to cope with the business-related impacts of the pandemic — 70.6% of which decided to shut down temporarily (Shinozaki, 2020). Others were able to transition with the help of digital technologies, allowing them to withstand the pandemic's impacts. These businesses started adopting social media and e-commerce platforms and meeting with clients via virtual setups, to name a few. For this research, we identified the enablers, barriers, and challenges faced by select Philippine MSMEs as they attempted to enhance their digital capabilities. Using the multiple case study research design, we examined the narratives derived from our in-depth interviews with 9 Philippine-based MSMEs. Our findings show that Philippine MSMEs experienced diverse enablers, barriers, and challenges during COVID-19 and exhibited increased openness to digital technologies. Finally, we present that MSMEs that can effectively address their barriers and challenges are likely to come out stronger in the post-pandemic era. Given this, post-pandemic resilience is necessary for MSMEs to sustain business operations, withstand future shocks, and capitalize on new business opportunities.

.

Keywords: Digital technology adoption, Enablers, Barriers, Challenges, MSMES, Philippines, Covid-19

---

* Universitas Gadjah Mada, Indonesia

** De La Salle University, Philippines

DOI: https://doi.org/10.61781/4-1I2024/1bmlm

INTRODUCTION

The COVID-19 pandemic has had a profound impact on businesses of all sizes, but micro-, small-and medium-scale enterprises (MSMEs) have been particularly hard hit. Since COVID-19 ravaged the Philippines in 2020, MSMEs have had to cope with many pandemic-induced challenges, including a drop in domestic demand and disruption of production and supply

chains, to name a few (Mia et al., 2021). According to a 2019 report by the Philippine Statistics Authority, MSMEs comprise 99.5% of the total number of businesses in the country. Of this number, a significant percentage — 70.6% — decided to temporarily shut down in the early months of the pandemic due to their inability to cope with the business-related impacts of COVID-19. Moreover, 58.8% reported zero income, whereas 28% stated revenues dropped over 30%. These challenges were unprecedented and severely affected Philippine MSMEs.

With limited resources and less resilience to economic shocks, MSMEs have been forced to adapt quickly to the new realities of the pandemic era. One of the most critical ways MSMEs have adapted is by adopting digital technologies (e.g., social media, e-commerce, video conferencing). By doing so, many enterprises were able to reach their market. For example, some started developing e-commerce platforms to virtually showcase their products and services. Others were able to shift their consultancy services from a physical setup to a virtual one. Still, a few began to speed up their digital transition by maximizing social media platforms (e.g., Facebook, Instagram, YouTube) available at no upfront costs.

The adoption of digital technologies by MSMEs can be affected by many factors. These factors can be broadly categorized as barriers, enablers, and challenges to MSMEs' digital technology adoption. While existing studies look at these factors, none examined how these affected MSMEs during the pandemic. This research paper aims to address this gap.

OVERVIEW OF LITERATURE

Digital Technologies and MSMEs: Barriers

Many barriers have been identified in MSMEs' attempts to adopt digital technologies. A common finding among studies was the capital limitations of MSMEs (Kannabiran, 2012; Khai et al., 2020; Levy et al., 2005). This financial restriction is related to a lack of faith in the ability of technology adoption to produce a return. Many MSME owners and decision-makers fail to recognize how the benefits of digitization will outweigh their investment costs (Khai et al., 2020). Regarding security, MSMEs are concerned about confidentiality and the fear of fraud, which are common online (Levy et al., 2005).

Strategically speaking, the barriers associated with management include not having enough time to plan due to a shortage of human resources (Levy et al., 2005; Machado et al., 2019). Some researchers noted that some MSMEs' owners and management have misconceptions about how difficult it is to implement digital technologies. These misconceptions can be partly due to a lack of digital competence, which includes a lack of knowledge and ability to apply the new technology (Levy et al., 2005; Machado et al., 2019). This, in turn, results in a lack of enthusiasm, a positive attitude, and inadequate prioritization for these technological changes (Khai et al., 2020).

Finally, the technology itself becomes a barrier. The complexity of adopting technology requires new skills. It may also entail trusting suppliers with better knowledge of this technology (Levy et al., 2005).

Digital Technologies and MSMEs: Enablers

Despite facing barriers, many MSMEs have decided to adopt digital technologies in their operations. These are due to factors that are enablers – things that make digital technology adoption possible. Kannabiran (2012) identified four enablers: perceived benefits, changes in the business environment, the owner's IT experience, and perceived competitive pressure.

"Perceived benefits" refer to the anticipated advantages that can help the organization (Mehrtens et al., 2001; Seyal et al., 2004). Tse and Soufani (2003) argue that digital technologies enable businesses to be more competitive and allow SMEs to increase operational efficiency and business expansion (Bhaskaran, 2013). Levy et al. (2005) identify nine benefits: (1) lower operating costs; (2) lower sales and purchasing costs; (3) increase in the range and quality of services offered to customers; (4) increase in the speed of goods distribution; (5) increase supplier diversity; (6) avoid market share loss; (7) increase market share; (8) better market intelligence; and (9) improve relationships with partners and customers.

Significant changes in the business environment were also identified as enablers. Relevant to this research, the pandemic caused substantial changes to the business environment by imposing several constraints on how businesses should operate. The governmental policies set as a response to the pandemic have catalyzed the digital transformation of many MSMEs, as doing so became a matter of survival or closure (Hamburg, 2021; Priyono et al., 2020).

Another identified enabler was the owner's IT experience and engagement. These are crucial for setting acceptable IT goals, recognizing business information needs, assigning financial resources, and supervising the execution (Kannabiran, 2012). Some researchers found in their empirical studies that CEOs significantly impacted the uptake of Internet technologies (Igbaria et al., 1998; Premkumar & Roberts, 1999). Manufacturing SMEs have a good attitude toward information and communications technology, primarily due to the owner/manager's opinion that ICT may improve operational efficiency (Somuyiwa & Adewoye, 2010).

Finally, the perceived competitive pressure was also identified as an enabler. When a business notices that its industry rivals are implementing cutting-edge technologies, it may feel pressured and decide to do the same to stay competitive (Cragg et al., 2002). An organization changes over time and resembles others because of industry competition pressures. The study by Julien and Raymond (1994) also supported the idea that SMEs are more likely to adopt technology if their rivals, suppliers, or entire industries are doing so.

Digital Technologies and MSMEs: Challenges

MSMEs that have already decided to adopt digital technologies still face challenges. Hamburg (2021) identified several challenges for SMEs implementing digital technology adoption processes. These challenges include the capacity to plan, start, and implement a digital transformation. A lack of knowledge or abilities typically exhibits the inability to manage and optimize the process. SMEs may not have specialized IT capabilities or specialists because they rely on the skills and knowledge of owners and management. However, for employees to fully benefit from digital transformations, they must possess the skills necessary to make the best use of available technologies while boosting output and performance. The complexity of digital

transformation can cause operations to worsen rather than improve if it is not planned correctly (Hamburg, 2021).

Kilimis (2019) noted that SMEs are frequently not fully aware of the implications of digitization. Because of this, the future economic benefits of digital technologies cannot be accurately calculated due to misconceptions about their complexity and cost (Sommer, 2015). A bad estimate frequently results in the wrong technology implementation priorities and choices. Incorrect implementation could threaten SMEs because they are substantially more cost-sensitive than large businesses (Kilimis, 2019).

Value Creation, Delivery and Capture: Business Model Elements For Digital Adoption

According to Edralin and colleagues (2018), the business model concept has been used by scholars, managers, and practitioners in describing and comprehending the following aspects of an organization: (a) the logic of value creation (Amit & Zott, 2001); (b) the value creation processes (Osterwalder et al., 2005); (c) the interactions and relationships among stakeholders in the firm's value network (Magretta, 2002); and (d) the resource base and its longitudinal evolution (Hedman & Kalling, 2003).

The business model literature frequently discusses the concepts of value creation, value delivery, and value capture (Abdelkafi et al., 2013; Bocken et al., 2014; Smith et al., 2010; Teece, 2010). For example, Osterwalder and Pigneur defined a business model as "the rationale of how an organization creates, delivers, and captures value" (2010, p. 14). Johnson, Christensen, and Kagermann (2008) assert that a business model is composed of four interlocking, interdependent elements—value proposition, resources, processes, and profit formula—that, when combined, create and deliver value. In a nutshell, the value proposition is derived from a product or service that meets the needs and desires of customers. Value is created and delivered through the effective use of organizational resources such as people, machinery, and buildings, as well as the application of work processes that eventually become ingrained in the organization's culture (Edralin et al., 2018). Finally, value is captured through the returns the organization generates through its activities (Chambers & Patrocinio, 2011).

Framing activities in terms of the business model elements - value creation, delivery, and capture - helps in framing, planning, and strategizing how digital technologies ensure that MSMEs survive and become resilient in this volatile environment. Khai and colleagues (2020) indicate that the pandemic provides the most opportune time to re-calibrate and reset their business models to incorporate digital technologies into their core strategies. As the pandemic brought disruptive changes, many MSMEs embraced technology to ensure sustainability, competitiveness, outreach, and engagement with a broader consumer base.

For our research, we aimed to capture the experiences of Philippine MSMEs that have chosen to enhance their digital capabilities during the Covid-19 pandemic. We wanted to identify the drivers and barriers of digital technology adoption among them and pinpoint their challenges after adopting these digital technologies. Drawing from the experiences and insights of these MSMEs, we provide some recommendations on how MSMEs can effectively harness these enablers and address these barriers and challenges.

METHOD

We chose the case study research method because we examined a contemporary phenomenon with some real-life context over which we had little control. Aside from allowing us to investigate the complexity and depth of the phenomenon we sought to understand (Yin, 2014), the qualitative case study method is a useful approach to theory formation through observation of constructs that emerge in real-world settings (Eisenhardt, 1991). We adopted the multiple-case design because analytic conclusions independently arising from multiple cases "will be more powerful than those from a single case alone" (Yin, 2003, p. 53).

We employed a purposive sampling approach to select companies, guided by theoretical dimensions identified in a structured literature review on entrepreneurial resilience (Autio et al., 2021). The principal investigator, leading a global project with our participation as members of the Philippines' country team, conducted the review. Specifically focused on the digital technology domain, we ensured diversity in our sample by selecting cases from various industries. Additionally, we purposively chose cases with varying levels of digital technology adoption, ranging from those seemingly devoid of tech adoption to those with intensive adoption impacting crucial aspects of their business models. Leveraging our professional networks, we contacted potential cases and sought referrals for cases aligned with our desired profile. Before initiating primary data collection, we gathered publicly available information about the selected companies online.

For our primary data gathering, we used an interview protocol created based on a priori assumptions specified in the structured literature review. The protocol served as a guide during the interview and to achieve the research goals. Given the semi-structured nature of the interview, we were able to ask additional questions and probe for specific answers when some interesting insights emerged. We also took field notes during the interview to facilitate data analysis. The interviews lasted anywhere from 30 minutes to 2 hours and 30 minutes. We conducted the first interview in December 2020, the second in April 2021, and the third in November 2021. After this, we transcribed all the interviews in preparation for the data analysis phase.

We first did open coding to analyze the data, documenting all the codes pertinent to the research themes. Three members of the team coded all the interviews simultaneously. Disagreements on coding were discussed and resolved as they arose through consensus. This process continued until the saturation point was achieved when no new code appeared. We then performed axial coding. We identified the actions of the entrepreneurs regarding digital technology adaptation. The list of actions comprised technology-related operations and other variables such as enablers, barriers, challenges for adapting digital technology, and their learning process. We subsequently identified emerging themes due to a closer examination of the codes. At this point, we identified the obstacles and issues faced by MSMEs during the COVID-19 epidemic and the subjects' digital technology adoption strategies. Lastly, we employed selective coding to zero in on the most important motifs.

Brief Description of the Selected Philippine MSMEs

Basic Movement is a Philippine fashion e-commerce platform curated by Esme Palaganas, a

master's student in Innovation, Creativity, and Leadership at the City University of London. Esme and her fashion studio manager in the Philippines run the business remotely. Basic Movement aims to empower Filipino fashion designers by providing them with a platform to sell their products and share their craft.

ECHO Store is an eco-sustainability social enterprise in the Philippines that offers natural and organic foods, cosmetics, and fresh produce. The store was established in 2009 and was founded by Reena Francisco, Chit Juan, and Jeannie Javelosa, the ECHOtrio as they call themselves. It sources its products from small entrepreneurs nationwide.

Everything Green Trading and Consultancy, Inc.or Everything Green, is an eco-start-up founded by Camille Albarracin. Everything Green is a company that helps businesses become more sustainable. They provide various services, such as consulting, training, and implementing sustainable practices. Everything Green is focused on the hospitality industry, and they believe that businesses in this sector have a responsibility to be more sustainable.

Fresco PH is an online clothing retailing business established by the Abis sisters, Abigael, Arabelle, Aljane, and Aibel, in August 2020. Fresco operates in Manila and Davao City and sources its products from Taytay, Rizal. The sisters support the advocacy of helping the local sewers adversely affected by the pandemic. Fresco sells women's loungewear on social media platforms.

Hungry Workhorse was established in 2016 as a consulting company based in Manila, Philippines. The company is led by its president and CEO, Rey Lugtu, whose expertise is in information and communication technology. The boutique firm focuses on strategy, technology, and people and has helped different organizations in their digital transformation journey.

Precision Flight Controls PH was established by Jett Javellena and his family in 2015 as a flight training facility provider for general aviation. The vision for the company is to provide classrooms, flight simulators, and other state-of-the-art training equipment to their clients in the flying school business. In 2019, the company started its flying school as recommended by the Civil Aviation Authority of the Philippines and has since then offered full-time pilot courses that train aspiring pilot trainees to become full-fledged pilots.

Snug Home Decor Trading is a micro-enterprise that sources home decorations (i.e., full-length mirrors) from its partner suppliers in the Philippines and then sells these through its e-commerce platform. Its founder, Charlene Ferrer, works part-time in the business with the assistance of her parents and siblings. According to Charlene, she started the company to support her family's financial needs.

The Murang Gulay Shop (The Affordable Vegetables Shop) is an online vegetable trader and retailer in Marikina, Philippines, founded by Reden Rojas in 2018. It is a social enterprise that buys agricultural produce from farmers in the provinces at fair prices and sells them in Metro Manila for less than or equal to market prices. TMGS aims to ensure that farmers and consumers in Metro Manila get fair prices.

Two Cinderellas Fish Baits Trading is a family business founded by Pransing Cabesares in Zambales, Philippines, in 1991. The enterprise started when she helped her husband assemble fish baits for fishing. The once small-scale production of fish baits for personal use led to the manufacturing of larger quantities for anglers in Zambales and other nearby towns.

RESULTS

For the cross-case analysis, we summarize the critical features of the nine MSMEs to identify noteworthy digital technology adoption practices. These were organized around the four major components of a business model, namely the value proposition, value creation, value delivery, and value capture. We look at the changes that the MSMEs made in these components. Then, we discuss the general pathway these MSMEs took in their digital technology adoption and findings related to the barriers, enablers, and challenges these MSMEs experienced.

Value Proposition

Except for ECHOStore and Two Cinderellas, many MSMEs that began before the pandemic showed no modifications in their value proposition. Before the pandemic, ECHOstore offered its stores natural and organic food, cosmetics, and household cleaning products. These products are all Filipino-made and are sold at competitive prices. During the pandemic, the store began offering tours and classes on the farm that it has developed aside from providing its existing products. The tours and classes are about reconnecting with nature in various aspects, such as starting your food garden. As for Two Cinderellas, the business maintained manufacturing low-cost fish baits for fishers. However, the enterprise also expanded into farming milkfish and shrimps. The owner decided to do to diversify the income that the business earns.

Value creation

In terms of value creation, most MSMEs focused on adding key partners such as Basic Movement. The firm shifted its value creation processes towards the ready-to-wear (RTW) segment from its initial focus on bridal entourage and corporate clients. The business partnered with other artists and designers who wanted to showcase their products on its e-commerce platform. ECHOStore continued its activities in value creation but has added staff to manage and maintain its farm to cater to tourists.

For others, changes in value creation involved either introducing new activities into their business model or streamlining existing ones. During the pandemic, Hungry Workhorse saw the opportunity to do event organizing and hosting, documentation management, and social media management on top of the activities it had been doing before the pandemic. In contrast, Everything Green temporarily stopped manufacturing and trading activities as it received no orders from hotels. It shifted to creating and selling home decor to customers to stir demand. The consultancy side of the firm was also activated as the firm's expertise on various topics became in demand. Now, the firm is streamlining its product portfolio for the export market.

There were also a lot of MSMEs that did not make any substantial change in their value-

creation process. For example, TMGS had continued engaging with farmers by offering to finance them at 0% interest. This arrangement with the farmers assured the supply of agricultural produce while helping the farmers earn more. Snug Home Decor Trading has not added new types of products during the pandemic. The value creation activities of Precision Flight Controls Philippines continue to be centered on pilot training, flight instructor training, and instrument rating, while Two Cinderellas before and during the pandemic focused on assembling fish baits and raising milkfish and shrimps.

Value Delivery

During the pandemic, most MSMEs introduced noticeable changes in how they delivered value using digital tools. Basic Movement started focusing on offering its products via the digital space (i.e., creating an e-commerce website). The delivery and payment arrangements became digital. ECHOstore decided to keep one physical store open. It shifted its attention to developing its website and getting more online traffic. Tourists would have to go to the farm, naturally. However, the classes can be delivered in person or online. Payment modes for products and services became digital.

The same happened with Everything Green as it was forced to offer its products digitally (e.g., the firm's Facebook page and e-commerce website). The delivery and payment arrangements became digital. Hungry Workhorse shifted to online platforms like Zoom to meet clients and do business. Precision Flight Controls Philippines shifted to online learning during the pandemic since movements were restricted. Since not all subjects can be done online, their students had to wait until face-to-face classes were permitted before they could take these subjects.

However, some MSMEs did not make any changes. TMGS had no change in its value delivery before and during the pandemic. The Shop has a physical warehouse/store and a Facebook page accepting online orders. The only difference is that TMGS now has more branches. Before the pandemic, there was only one, but now it has three branches. Since it started, Snug Home Decor Trading has focused on selling and promoting its products online via social media accounts. The business also personally delivers the mirrors to its clients to avoid potential damages or scratches compared to having the products delivered through third-party couriers. There was no change in value delivery during the pandemic. Although Two Cinderellas explored using social media to sell their fish baits, they reverted to traditional selling, which is more convenient for the owner and its loyal customers.

Value Capture

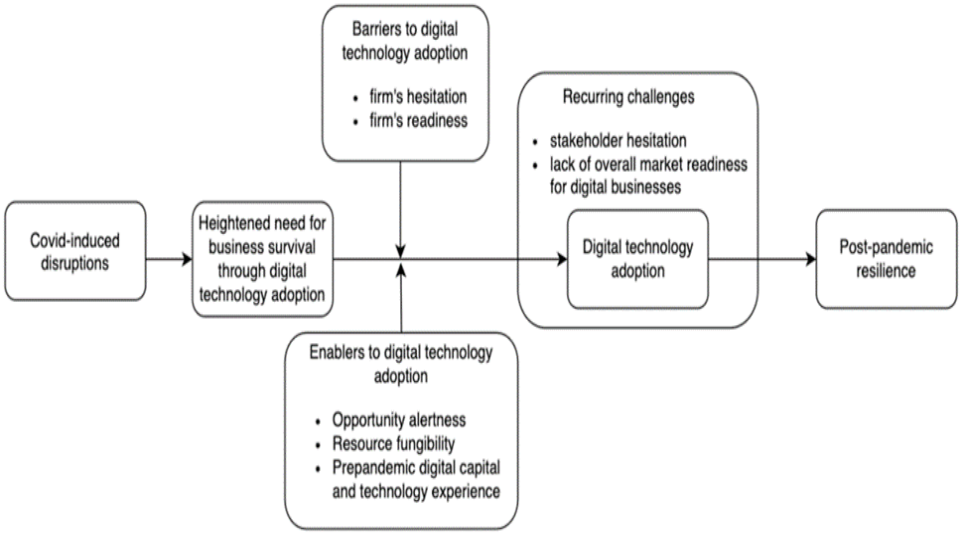
Finally, the pandemic allowed some MSMEs to transform their value capture process. During the pandemic, Basic Movement's cost structure is now characterized primarily by developing its e-commerce platform while having the same sources of revenue. It also started relying more on sales commissions via the RTW segment. For ECHOStore, it augmented its income from its retailing activities with tourist and class registration fees. While the same cost structure still applies, more money is now devoted to ensuring the website remains relevant online. For the farm, costs will include the maintenance of the farm and the inputs for producing organic farm products. Everything Green's revenue sources now come from an expanded product portfolio,

but this is minimal. More revenue comes from the consulting side of the firm. Cost is also lower as there is minimal production. As for Hungry Workhorse, the store benefited from its new value-creation activities as it became a new revenue stream for them.

Some businesses introduced no change at all. Revenues of Precision Flight Controls Philippines were limited to their usual value-creation activities. Aside from this, the company also earns from renting out its state-of-the-art equipment. Since it started, Snug Home Decor Trading's primary revenue source has been selling mirrors. It has not diversified its revenue sources since then. However, the firm has planned on venturing into other home decor products, but none of this has yet materialized. The business's cost structure is characterized primarily by the maintenance of its e-commerce website. TMGS had no change in its value capture before and during the pandemic. The Shop's primary source of revenue is the sale of vegetables and fruits. The Shop's cost structure is associated with its sourcing and retailing activities. As for Two Cinderellas, the business generated revenue mainly from its primary value-creation activities.

It is noticeable how Philippine MSMEs that transitioned to or enhanced their digital capabilities experienced various enablers, barriers, and challenges during the COVID-19 pandemic. This transition or enhancement allowed MSMEs to develop viable business models that proactively respond to changes in the business environment (e.g., customer preferences, purchasing behavior, competitive pressures). Our study shows that Philippine businesses exhibited a higher openness to digital technologies during the pandemic. Figure 1 provides an overview of the enablers, barriers, and challenges that confronted Philippine MSMEs as they transitioned to or enhanced their digital capabilities. The authors crafted Figure 1 to visually depict the process of digital technology adoption among Philippine MSMEs during the pandemic, drawing insights from the case narratives.

Figure 1. Digital technology adoption of Philippine MSMEs during Covid-19



Source: Authors' own

COVID-INDUCED DISRUPTIONS AND NEED FOR BUSINESS SURVIVAL

Covid-induced disruptions had a significant impact on the operations of MSMEs. Some disruptions include mobility restrictions and shifting to a remote work setup, to name a few. Acknowledging that these disruptions will linger throughout the pandemic, MSMEs experienced a heightened need for survival using digital technologies. By doing so, the MSMEs could continue servicing their client's needs and enable virtual communication among their people. The MSMEs' transition to the enhancement of their digital capabilities, however, was far from simple. The following sections present the enablers, barriers, and challenges that the MSMEs went through during the pandemic.

Enablers

The enablers were critical to the MSMEs' survival during COVID-19. There were three enablers evident in the experiences of the MSMEs in our study. First, we observed several MSMEs with a significant level of alertness when pursuing opportunities in the digital space. Alertness was manifested in the cases of Basic Movement, Everything Green, and Hungry Workhorse, in which the adoption of digital platforms was especially emphasized (e.g., social media, e-commerce, and video conferencing).

We also observed that MSMEs using their digital capital in various business functions and situations could successfully adopt digital technologies. Hungry Workhorse, for instance, uses its digital expertise to adopt digital technologies for different business functions. Finally, some businesses had already used digital technologies even before the crisis. Inevitably, these businesses reaped the benefits from such endeavors and were able to gain a head start.

MSMEs alert to new opportunities in the virtual space can successfully adopt digital technologies. Some examples of these technologies include social media, e-commerce, and video conferencing, to name a few. Basic Movement, for instance, saw the benefits of developing an e-commerce platform (e.g., generating online-based sales and communicating virtually with clients). With this, the business started developing the technology with the assistance of its collaborators. On the other hand, Hungry Workhorse actively sought opportunities to learn how to use digital platforms. Ultimately, this led to the company adopting video conferencing tools such as Zoom and Microsoft Teams, to name a few.

The experience of Everything Green is somehow different. Initially, the business considered itself "traditional" and preferred face-to-face client interactions. During the COVID-19 pandemic, however, the business experienced various disruptions (e.g., the inability to meet physically with employees). These disruptions prompted the company to seek opportunities to extend services virtually. Eventually, the business optimized its use of digital platforms. Given this, a significant portion of its business activities are now online.

We optimized Zoom. We can do a lot with Zoom, like the breakout rooms and things like that. It's not- because we're a traditional social enterprise that we didn't really use Zoom before and all. Still, now all the training, all the collaborations, even the design thinking workshops, and the hackathons were done through Zoom.

(C. Albaraccin, personal communication, May 13, 2021)

Second, the MSMEs in our study also demonstrate resource fungibility, the characteristics of a resource that permit or impede its deployment for different applications (Sapienza et al., 2005). MSMEs that can use and reuse their resources (e.g., digital capital) in various activities and situations can successfully adopt digital technologies, such as the case of Hungry Workhorse. Hungry Workhorse uses its digital expertise and knowledge to identify digital platforms it can adopt for business use (e.g., consultancy, advertising, operations, etc.). The business can apply its digital expertise in several business functions and activities.

I started to study this in the first two months, around March and April. I was studying extensively. How do we adapt digitally? I studied how companies should adopt. I redesigned my engagement to include virtual engagement. I always start with, "How do you conduct business virtually?" That's my first pitch to clients. How do you conduct business virtually in a global setting? All the consulting comes in from there.

(R. Lugtu, personal communication, December 28, 2020)

Finally, MSMEs with some pre-pandemic digital capital can successfully adopt or enhance their digital technologies. Basic Movement, for instance, highlighted that if a business did not resolve its online identity and digital platforms from the beginning, it is most likely struggling today. For companies that could establish their online identity, there is a higher likelihood of coping and sustaining their operations.

Meanwhile, Hungry Workhorse explained how being active in the digital space before the pandemic helped them address some initial challenges. The business showed that being an early adopter of social media platforms like LinkedIn helped it gain leverage. Since the firm had a sizable digital presence before the pandemic, it gained clients quickly and became the go-to brand for innovation, digitization, and digital transformation consultancy services.

Barriers

Due to COVID-induced disruptions (e.g., mobility restrictions), businesses must adopt digital technologies quickly (e.g., social media, e-commerce, video conferencing). This strategy was met with the firm's hesitation and readiness to adopt digital technologies. As shown by our findings, some businesses have not yet wholly accepted the use of technology for various reasons — one being its lack of applicability to the business's current practices.

Two MSMEs interviewed expressed hesitation and readiness to adopt digital technologies during the pandemic. For instance, the founder of Precision Flight Controls PH, a flight school, expressed some initial reluctance to use digital technology. Given the unique challenges posed by the pandemic, however, the founder decided to pursue it to continue servicing its clients' needs. The business is still assessing whether the online setup will continue to be implemented once the pandemic subsides.

I'm not really a fan of the online [class setup]. But, if they want, let's do it online now, and once everything is back to normal, and if they have the same subjects that they were not really able to understand well, they could sit in for free. I invited them like that, so—the quality [of the classes] is not really good when done online. Just to adapt, we did some (classes) online.

(J. Javellana, personal communication, June 23, 2021)

Meanwhile, businesses such as Two Cinderellas do not find the need to adopt digital technologies because of some initial impressions of how the technology is being used by its competitors. The founder of Two Cinderellas shared that other businesses tend to post their transactions on social media "even though they did not make [the products] (P. Cabesares, personal communication, June 14, 2021)." The case of Two Cinderellas appears to be a general hesitation on adopting digital technologies due to concerns that it can affect the brand's reputation and, ultimately, the entrepreneur's integrity.

Maybe I would think of building that [online] shop, but I actually don't post my transactions on social media. Like the one in Bolinao [another town], he posts all his transactions, but I don't want that… I prefer private transactions instead of posting them. As for them [their competitors], they post their products even though they didn't make them… I don't want to get mixed up with that style.

(P. Cabesares, personal communication, June 14, 2021)

While the MSMEs in our study demonstrated how barriers might substantially impact whether a business would ultimately adopt digital technologies, such hurdles can also be overcome. Sharing knowledge and best practices among companies can help others begin and learn to adopt digital technologies. Proper support mechanisms must also be set to ensure businesses can transition effectively. Among these include training and educating entrepreneurs on the use of technology.

Initially, we included the lack of access to financial resources as a barrier to digital technology adoption. However, we observed that this was not relevant to our cases. Most businesses interviewed use social media platforms that are already available at no upfront costs (e.g., Facebook, Instagram, and YouTube). Therefore, seeking financial capital is unnecessary to develop the business's digital capabilities.

Similarly, we initially included the lack of infrastructure development to digital technology adoption as a barrier. However, the cases of our respondents show otherwise. Despite the current lack of internet infrastructure in the Philippines, most businesses interviewed manifested a considerable knowledge and use of digital technologies, especially social media. The entrepreneurs also reside in areas with internet access that provides the sufficient capability to access social media. As stated, the real barrier is the stakeholder's hesitation and lack of readiness to use the existing platforms.

On the other hand, we also initially included the lack of a digital skill set as a barrier. However, we learned that this is not necessarily the case. For instance, the owner of Basic Movement does not have a background in information technology or computer programming. Instead, we found that the entrepreneur made use of two approaches: (1) using existing social media platforms they are already familiar with and which do not require a significant digital skill set, and (2) enlisting the assistance of outsourced connections who are more well-versed in developing digital technologies. Therefore, lacking digital skill sets is not necessarily a barrier to adopting digital technology.

Recurring Challenges

Once the MSMEs find an effective approach to digital technology adoption, new challenges continue to arise. Our findings showed stakeholders' hesitation and lack of overall market readiness for digital businesses. For instance, due to cybersecurity concerns, Snug Home & Lifestyle highlighted that some clients do not want to send payments via online channels. The clients prefer paying when the products have been delivered because it assures them that they were delivered safely.

We cannot help but have customers who are more willing to pay in cash. They want to pay upon delivery to ensure that the item is delivered well, lives up to their standards, and we live up to our promises. We cannot force the customers to pay online because they, too, have their reasons.

(C. Ferrer, personal communication, May 22, 2021)

On the other hand, Fresco emphasized that the market's readiness for digital businesses is also a significant challenge. The founder mentioned that it is something the government can look into, particularly cybersecurity security concerns and ensuring the protection of consumers when using digital platforms for transactions.

[The use of digital platforms] added risks as well. I think this is something the government can look into — protection not just for businesses but also for consumers. If consumers do not trust these platforms, how will these online businesses thrive?

(A. Abis, personal communication, May 23, 2021)

We highlight that these challenges are recurring and beyond the MSMEs' control. Therefore, these are challenges that do not necessarily get resolved immediately. Nonetheless, we further argue that addressing such challenges to digital technology adoption can help businesses develop post-pandemic resilience, particularly in sustaining business operations, withstanding future shocks and disruptions, and capitalizing on new business opportunities.

CONCLUSION

The COVID-19 pandemic caused unprecedented challenges for Philippine MSMEs, forcing many to utilize digital technologies (e.g., social media, e-commerce, video conferencing) to meet customer needs. The literature gives a detailed overview of how adopting digital technology may benefit businesses, thus providing a compelling reason for implementing these technologies. Our research offers an account of the experience of Philippine MSMEs that have either resolved to adopt digital technologies or enhance their current digital capabilities in the face of the COVID-19 pandemic, specifically the enablers, barriers, and challenges they faced in doing so. We identified the entrepreneurs' actions toward digital technology adoption and their activities, highlighting how their level of awareness to pursuing opportunities in the digital space, their digital expertise, and existing digital technologies serve as critical enablers.

However, the journey to embracing digital technology is not that simple, as there are barriers that impede businesses from adopting and challenges for those who have already started. For the MSMEs in our study, the hesitation to adopt digital technologies due to various concerns, such as the firm's readiness and its potential impact on brand reputation, were identified.

One significant finding of our study is that contrary to the literature (e.g., Asare et al., 2012; Nikolopoulos & Dana, 2017), the lack of access to financial resources did not pose a barrier to adoption among the MSMEs in our study. This situation is likely because these MSMEs' digital technologies are available at no upfront costs. Furthermore, the lack of infrastructure development and digital skill set as barriers were not evident among the MSMEs in our study. Finally, our research accounts for the different challenges MSMEs experience after embracing digital technologies, mainly attributable to the market's general readiness to transact utilizing digital technologies. The primary reason impeding market readiness is cybersecurity concerns.

While these challenges' recurrent and external nature suggests that resolution may require time, we contend that overcoming them can significantly enhance pandemic resilience. Addressing such challenges necessitates collaborative efforts from various stakeholders. MSMEs can adopt an educational approach for their staff, as well as current and potential customers, promoting the advantages of digitalization while avoiding cybersecurity issues, such as scams. These efforts can be further reinforced by extensive awareness campaigns conducted by the government and media, specifically focusing on popular online scams. Concurrently, law enforcement agencies should intensify their endeavors to apprehend cybercriminals, thereby alleviating public concerns regarding the use of digital technologies. Only through a united and concerted effort can these concerns be effectively addressed.

Recommendations

Our study provides an overview of the enablers, barriers and challenges MSMEs experienced in digital technology adoption at the height of the COVID-19 pandemic. Further research can investigate how MSMEs adopt digital technologies, considering these enablers, barriers, and challenges. Future research can also address the possible interrelationship between the identified enablers, barriers, and challenges to digital technology adoption and its impact on MSMEs. Finally, as our study suggests, the nature of challenges in digital technology adoption is recurring and external. As such, it would be beneficial to understand how MSMEs attempt to overcome the challenges they encounter in adopting digital technologies.

ACKNOWLEDGMENTS

The authors of this article were part of a global research project titled "Entrepreneurial Resilience and Recovery During and After COVID-19 Crisis: Firm- and Community-Level Responses in China, Malaysia, Philippines, and Thailand", which was supported by the UK Research and Innovation (UKRI). Led by principal investigator Professor Erkko Autio of Imperial College, London, this project was a collaboration between the Asian School of Business, De La Salle University, Imperial College, London, Mahidol University, Tsinghua University, Wuhan University, Asian Development Bank, and the UN Economic and Social Commission for Asia and the Pacific.

REFERENCES

Abdelkafi, N., Makhotin, S., & Posselt, T. (2013). Business models innovation for electric mobility: What can be learned from existing business model patterns? *International Journal of Innovation Management*, *17*(1), 1–41. https://doi.org/10.1142/S1363919613400033

Amit, R., & Zott, C. (2001). Value creation in e-business. *Strategic Management Journal*, *22*, 493–520.

Asare, S. D., Gopolang, B., & Mogotlhwane, O. (2012). Challenges facing SMEs in the adoption of ICT in B2B and B2C E-commerce: A comparative case study of Botswana and Ghana. *International Journal of Commerce & Management*, *4*(22), 272–285.

Autio, E., Nair, R., Habaradas, R., Shannon, R., Abe, M., Park, D., Jinjarak, Y., Yuan, X., Idoko, O., Jimenez, S., Mia, I. B., Corpus, J. E., & Haider, M. (2021). *Entrepreneurial resilience and recovery during and after COVID-19 crisis: Firm- and Community-level responses in China, Malaysia, Philippines, Thailand, and the United Kingdom*. https://www.entresilience.com/output.

Bhaskaran, S. (2013). Structured case studies: information communication technology adoption by small-to-medium food enterprises. *British Food Journal*, *115*(3), 425–447.

Bocken, N., Short, S., Rana, P., & Evans, S. (2014). A literature and practice review to develop sustainable business model archetypes. *Journal of Cleaner Production*, *65*, 42–56. https://doi.org/10.1016/j.jclepro.2013.11.039.

Chambers, E., & Patrocinio, M. (2011). *Business models and value creation: A case study of the New York City Economic Development Corporation*. Umea University Sweden.

Cragg, P., King, M., & Hussin, H. (2002). IT alignment and performance in small manufacturing firms. *Journal of Strategic Information Systems*, *11*, 109–132.

Edralin, D. M., Habaradas, R. B., Sarmiento, F. J., & Fumar, L. (2018). Business model innovation: How do government training institutes in the Philippines create, deliver, and capture value? *Asia-Pacific Social Science Review*, *18*(1), 78–90.

Eisenhardt, K. M. (1991). Better stories and better constructs: The case for rigor and comparative logic. *Academy of Management Journal*, *16*(3), 620–627.

Hamburg, I. (2021). Impact of COVID-19 on SMEs and the Role of Digitalization. *Advances in Research*, *22*(3), 10–17. https://doi.org/10.9734/air/2021/v22i330300.

Hedman, J., & Kalling, T. (2003). The business model concept: Theoretical underpinnings and empirical illustrations. *European Journal of Information Systems*, *12*, 49–59.

Igbaria, M., Zinatelli, N., & Cavaye, A. L. (1998). Analysis of information technology success in small firms in New Zealand. *International Journal of Information Management*, *18*, 103–119.

Johnson, M., Christensen, C., & Kagermann, H. (2008). Reinventing your business model. *Harvard Business Review*, *86*(12), 50–59.

Julien, P. A., & Raymond, L. (1994). Factors of new technology adoption in the retail sector. *Entrepreneurship Theory and Practice*, *8*, 79–87.

Kannabiran, G. (2012). Enablers and inhibitors of advanced information technologies adoption by SMEs: An empirical study of auto ancillaries in India. *Journal of Enterprise Information Management*, *25*(2), 186–209. https://doi.org/10.1108/17410391211204419.

Khai, K. G., Onn, Y. W., Zulkifli, R. B., Kandasamy, S., & Ahmad, A. B. (2020). The necessity to digitalize SMEs business model during the COVID-19 pandemic period to remain

sustainable in Malaysia. *Journal of Education and Social Sciences*, *16*(1), 73–81. www.nst.com.my.

Kilimis, P., Zou, W., Lehmann, M., & Berger, U. (2019). A survey on digitalization for SMEs in Brandenburg, Germany. *IFAC-PapersOnLine*, *52*(13), 2140–2145. https://doi.org/10.1016/j.ifacol.2019.11.522.

Levy, M., Powell, P., & Worrall, L. (2005). Strategic intent and e-business in SMEs: enablers and inhibitors. *Information Resources Management Journal*, *18*(4), 1–20.

Machado, C. G., Winroth, M., Carlsson, D., Almström, P., Centerholt, V., & Hallin, M. (2019). Industry 4.0 readiness in manufacturing companies: Challenges and enablers towards increased digitalization. *Procedia CIRP*, *81*, 1113–1118. https://doi.org/10.1016/j.procir.2019.03.262.

Magretta, J. (2002). Why business models matter. *Harvard Business Review*, *80*(5), 86–92.

Mehrtens, J., Cragg, P. B., & Mills, A. M. (2001). A model of internet adoption by SMEs. *Information & Management*, *39*, 165–176.

Mia, I. B., Habaradas, R., & Jimenez, S. (2021). Digitalization: A way forward for Filipino MSMEs during the Covid-19 pandemic. *DLSU Business Notes & Briefings*, *9*(2).

Nikolopoulos, K. P., & Dana, L. P. (2017). Social capital formation in EU ICT SMEs: The role played by the mobility of knowledge workers. *European Management Review*, *14*(4). https://doi.org/https://doi.org/10.1111/emre.12113.

Osterwalder, A., & Pigneur, Y. (2010). *Business model generation: Handbook for visionaries, game changers, and challengers*. Wiley.

Osterwalder, A., Pigneur, Y., & Tucci, C. (2005). Clarifying business models: Origins, present, and future of the concept. *Communications of the Association for Information Systems*, *16*, 1–40.

Philippine Statistics Authority. (2019). *MSME Statistics*. https://www.dti.gov.ph/resources/msme-statistics/

Premkumar, G., & Roberts, M. (1999). Adoption of new information technologies in rural small businesses. *The International Journal of Management Science*, *27*, 467–484.

Priyono, A., Moin, A., & Putri, V. N. A. O. (2020). Identifying digital transformation paths in the business model of SMEs during the COVID-19 pandemic. *Journal of Open Innovation: Technology, Market, and Complexity*, *6*(4). https://doi.org/https://doi.org/10.3390/joitmc6040104.

Sapienza, H., Autio, E., George, G., & Zahra, S. A. (2005). A capabilities perspective on the effects of early internationalization on firm survival and growth. *The Academy of Management Review*, *31*(4), 914–933. https://doi.org/10.5465/AMR.2006.22527465.

Seyal, A. H., Awais, M. M., Shamail, S., & Abbas, A. (2004). Determinants of electronic commerce in Pakistan: Preliminary evidence from small and medium enterprises. *Electronic Markets*, *14*, 372–387.

Smith, W., Binns, A., & Tushman, M. (2010). Complex business models: Managing strategic paradoxes simultaneously. *Long Range Planning*, *43*, 448–462. https://doi.org/10.1016/j.lrp.2009.12.003.

Sommer, L. (2015). Industrial revolution – industry 4.0: Are German manufacturing SMEs the first victims of this revolution? *Journal of Industrial Engineering and Management*, *8*(5), 1512–1532. https://doi.org/10.3926/jiem.1470.

Somuyiwa, A. O., & Adewoye, J. (2010). Managing logistics information system: theoretical underpinning. *Asian Journal of Business Management*, *2*, 41–47.

Teece, D. J. (2010). Business models, business strategy, and innovation. *Long Range Planning*, *43*, 172–197. https://doi.org/10.1016/j.lrp.2009.07.003

Tse, T., & Soufani, K. (2003). Business strategies for small firms in the new economy. *Journal of Small Business and Enterprise Development*, *10*(3), 19–49.

Yin, R. K. (2003). *Case study research: Design and methods* (3rd ed.). Sage Publications, Inc.

Yin, R. K. (2009). *Case study research: Design and methods* (4th ed.). Sage Publications, Inc.

Yin, R. K. (2014). *Case study research: Design and methods* (5th ed.). Sage Publications Inc.