

A Look at the Digitalization Strategies of Paraguayan Companies: Impact of the Drivers in the Context of MSMEs

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Abstract

All of the world's productive sectors are being impacted by the phenomenon known as digitalization, but different economies are experiencing this phenomenon in different ways due to a variety of internal and external factors at play in the businesses. According to official statistics, they make up 97% of the nation's commercial fabric and generate a sizable amount of employment (about 60%) and gross domestic product (GDP) for the nation. By categorizing Paraguayan MSMEs by economic sector, size, and age, the goal of this paper is to examine the influence of digitalization drivers in this context. In order to achieve this purpose, data was collected through a survey during the months of April to September 2022. The findings show that MSMEs' owners value the key forces influencing digitization. On the other hand, they point out to the fact that varied behaviors are displayed depending on the business sector, size, and age of the company, which calls for specialized tactics and attention to improve digitalization in MSMEs.

Keywords: digitalization; MSMEs; drivers; impact

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Introduction

The term "digitalization" is used to characterize a variety of social and technological phenomena, as well as adoption and usage processes of digital technologies in a broad individual, organizational, and social context (Legner et al., 2017). Therefore, digitization is a phenomenon that impacts all productive sectors globally; however, due to a variety of internal and external factors, the adoption of new technologies and the resulting transformation of goods, services, and business models vary significantly across different economies.

In this sense, digitization is an issue that is not only dynamic in the context of large corporations, but has become a survival tool for micro, small and medium-sized enterprises (MSMEs), either through the incorporation and application of basic technologies or some that are more complex. The need for and extent of digitization gained momentum during the COVID-19 pandemic crisis, which effectively compelled businesses to digitize their processes.

Similarly, in this environment of rising speed and competitive pressure, businesses in general, and particularly MSMEs, have had to reform and adapt to digital transformation in order to maintain a certain level of competitiveness in their immediate environment. However, the concept of digitization or digital transformation appears to be very broad and complex, particularly when it comes to MSMEs in developing countries such as Paraguay, due to either the owners' lack of knowledge, their own cultural barriers, or their attachment to traditional practices as a management model.

In this sense, MSMEs are the most dynamic elements of the Paraguayan economy, accounting for 97% of the country's business fabric and contributing significantly to employment generation (around 60%) as

well as the country's Gross Domestic Product (GDP). However, these businesses face structural issues such as high informality, low productivity, factors associated with poor job quality, and restricted access to qualified human, financial, and technological resources (Bughin & Van Zeebroeck, 2017; Hess et al., 2016).

Given the importance of MSMEs to the Paraguayan economy and, more broadly, to all economies throughout the world, it is critical to examine and build a context that allows for greater growth while closing the gaps described in the preceding paragraph. In this context, information and communication technologies (ICT) or digitalization emerge as tools that can help these businesses improve and thrive. As a result, this study presents an analysis of the digitization strategies of Paraguayan MSMEs, based on the assessment of the variables that drive or motivate the company's digitization, with the understanding that these driving elements might contribute to the definition of their digitization strategies.

Theoretical framework

Defining digitalization

When talking about digitalization or digitization, we are referring to digital adoption and the implementation, application, and use of digital technology in MSMEs, with the objective of improving and supporting decision-making processes and the socio-economic transformation of the business (Gradillas & Thomas, 2023). Ross (2017) suggests that there is a difference between being digitized and being digital. Said author discusses how being digitized implies moving from the use of analog data to digital data to improve and streamline existing processes in companies, and on the other hand, he points out that being digital refers to making digital value propositions with continuous testing and revisions since the final state of the

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processes is not known (Ross, Beath, & Mocker, 2019). Other authors, such as Coreynen, Matthyssens and Van Bockhaven (2017), do not make a distinction between the terms digitalization or digitization, while Brennen and Kreiss (2016) base their distinction on an extensive and interdisciplinary literature review. In this sense, Ritter and Pedersen (2020) have developed a definition to discuss the digitalization capability of a company based on its level of digitalization. Likewise, Reis et al. (2020) conduct a systematic literature review to define the term digitalization, and in their findings, they mention that companies seek to improve their competitive advantage through digitalization and the development and use of new technologies.

Yoo et al. (2017) define digitalization as the development and implementation of ICT systems and as an organizational change that involves the transformation of structures previously mediated by non-digital artifacts into other structures mediated by digital artifacts. In that sense, the definition by Eling and Lehmann (2018) speaks of the integration of the analog and digital worlds with new technologies that enhance customer interactions, data availability, and business processes.

MSMEs' Digitalization Strategies

Currently, the adoption of some digitization methods is regarded as a need rather than an option in businesses, whether multinational, large, or MSMEs, independent of the productive sector in which they operate or their geographical location (Uribe et al., 2022). As a result, assimilation of new digital technologies is critical for maintaining competitiveness, particularly in smaller businesses (Ferrer, 2022). According to Morgan (2019), over 70% of global digital transformation programs fail because firms did not change their mindsets and processes, or did not create cultures that facilitated such a change.

According to Schwartz (2001), organizations with more adaptive strategies that can respond to new technology trends will survive, while those that cannot adapt to the new digital economy would likely die. On the other hand, digital growth in a company is frequently based on its investment capacity, sales, and market position; similarly, within the strategic elements, training, follow-up, monitoring, and consideration of the operational part can be promoted, in order to achieve adequate digitization process implementation (Pacheco, 2020).

As a result, governments are particularly interested in the execution of digital transformation plans directed at micro, small, and medium-sized firms, considering their importance in national economies (Bharadwaj et al., 2013). In this regard, while smaller businesses require more effort to produce digital transformation capabilities, they continue to do so, albeit at a slower pace than larger businesses, taking longer to reap the benefits of digital technologies (Peter et al., 2020). To successfully advance in this process, these firms must create digital capabilities that are linked with their strategic objectives. Berman (2012), Kane et al. (2016), and Li et al. (2018).

In this sense, there are numerous reasons why businesses should implement digitalization, but according to the literature, the primary goal is competitive advantage, considering that incorporating

technology means the possibility of adding value for the customer through the inclusion of some intelligent digital process along the production or service chain. Companies can be directed toward a digital transformation as a result of the execution of some digital strategies, which involves the adoption of new and innovative ways of doing business with digital tools based on technical breakthroughs (Cuenca-Fontbona et al., 2021).

Researchers in the information

systems literature have long given close attention to technical improvements associated to the adoption and use of digital technologies, as well as the ensuing commercial value (Nambisan et al., 2017, Sambamurthy et al., 2003). In this context, the pressure on companies to align their business and strategy with technological changes in the environment has significantly increased with the emergence and growing importance of new digital technologies such as social networks, big data, cloud computing, internet of things, and artificial intelligence, among others (Uribe et al., 2022).

MSMEs, on the other hand, must build management strategies in order to lead more complicated digital transitions (Berman; 2012). To that end, companies that intend to incorporate and implement basic or more complex technologies must do so in accordance with a well-defined strategy that allows organizations the flexibility and responsiveness required to generate new value propositions for customers and transform operating models (Juca et al., 2019). From a digital standpoint, there are several growth options for businesses (Broekhuizen et al., 2018; Parker et al., 2016).

As a result, going digital is more than just having a stronger digital presence through the use of a website or the adoption of teleworking; it is a transition that affects, in some manner, all sectors and levels of the firm. In similar vein, Parviainen et al. (2017) suggest an incremental model based on the extent of adoption of digital technologies and their impact on the value chain, emphasizing the need of having a digital strategy as a requirement for the transformation's success.

Barriers to MSMEs' Digitalization

Unlike major enterprises, which typically have a digital strategy and high-level human resources to operate their businesses, MSMEs typically thrive in the situation with more constrained resources and constrained specialization capabilities due to their size (Gurbaxani and Dunkle, 2019). As a result of their dependence on day-to-day operations and limited opportunities to create novel solutions, MSME employees typically lack the skills required for digital transformation.

Furthermore, because these organizations' financial resources are limited and they cannot afford considerable external guidance, the requirements for digital capabilities must be cheap and time efficient (Goerzig and Bauernhansl, 2018; Gruber, 2019). MSMEs, on the other hand, have some advantages, such as a simpler hierarchical level, which allows for speedier decision making and can be useful for developing strategies and executing digitalization measures in their operations (North and Varvakis, 2016).

According to Uribe et al., (2022), the introduction of these technologies has a positive impact on the cost structure of companies that are forced to transform digitally, generate new marketing channels that are distinct from traditional ones, and also aims to meet the new trends in consumer behavior, toward digital purchases. It is also true that the Covid-19 pandemic has undoubtedly encouraged the inclusion of digital tools in the corporate sector, which has been both a tremendous obstacle and a doorway of chances for smaller enterprises and resources (Ferrer, 2022). Thus, micro, small, and medium-sized businesses have suffered the most as a result of the crisis's ramifications, and while they have embraced digital processes out of necessity, they are the ones that continue to delay digitalization initiatives owing to a lack of strategies.

As a result, the challenge for MSMEs faced with the need to advance digitalization is oriented first and foremost in defining strategic digital and analytical priorities throughout the value chain, impacting from product development to supply or customer experience (Quinton et al., 2018); however, professional profiles are required to help make this digital transformation quickly and successfully (Balsmeier and Woerter, 2019). Second, for the digital transformation to be successful, the digital foundation, operations, and workers' digital skills require the collective support of leaders and a digitally aligned culture (Casalet, 2020).

In conclusion, it appears that the main barriers to this process in less developed countries, particularly in MSMEs, are related to limited digital infrastructure, as well as a lack of a business culture that promotes this process in management practices, as well as the leadership and skills required to work on the digital transformation process in the companies.

Digital Transformation Resources in the MSME Context

Digitalization is a challenge that all countries, cities, industries, businesses, and people must face; however, digital transformation is dependent not only on the availability and use of digital technologies, but also on the capabilities developed and strategies implemented (Kraus et al., 2022; Kraus et al., 2019). Unfortunately, not all organizations, particularly MSMEs, have significant resources to accomplish effective technological implementation, causing them to lag behind the market and lose competitiveness (Caballero et al., 2022). As a result, failing to invest in resources to promote digitalization may put MSMEs at risk of falling behind (González Arencibia & Martínez Cardero, 2014).

These resources are not always financial, and the pandemic situation has shown that, in order to sustain the digitization process, MSMEs must make changes in areas such as concurrence, cooperation, and collaborative responsibility in their activities (Alonzo-Godoy & Cervantes, 2020). These flaws can be attributed to restrictions in the price and quality of the Internet, as well as constraints in human capital, limited penetration of payment methods, and the inadequately diverse nature of the producing structure.

Additionally, according to Parra and Zorrilla (2016), small businesses in general have not yet deepened the process of understanding the economic potential of digital technologies, beyond the basic use (which is primarily associated with presence in social networks or communication and information search activities), elements that influence an eventual investment in ICTs. In this regard, these organizations must boost the resources committed to training in order to improve digital management abilities in the context of MSMEs. However, as it affects the deepest part of organizational structures, business digitalization causes us to think beyond technological resources (Armas, 2018).

Methods

The data analyzed in this study were gathered through a survey administered to 350 companies nationwide, chosen from a stratified random sample based on the strata specified in Table 1, which include: economic sector (manufacturing industry, services, commerce), and company size (micro: 1 to 10 workers, small: 11 to 30 workers, and medium: 31 to 50 workers). Applying the population sizes of the 2011 National Economic Census released by the National Institute of Statistics, a sampling error of 5.2% with a confidence level of 95% was calculated using the sample design presented in the study.

To guarantee the representativeness of the sample of selected companies, the sample framework used was a combination of data from the General Directory of Companies and Establishments (DIRGE) administered by the National Statistics Institute (INE) and administrative records from the Vice-Ministry of MSMEs of Paraguay.

Table 1. Distribution of the sample by company size, according to economic sector

Economic Sector	Company Size			Total
	Microenterprise	Small enterprise	Medium-sized enterprise	
Industry	47	27	14	88
Commercial	54	29	9	92
Services	99	46	25	170
Total	200	102	48	350

Source: original analysis based on sample data.

The study was conducted between April and September 2022 using a self-administered electronic questionnaire with closed questions and disseminated via e-mails and some face-to-face interviews to business owners or managers. As a strategy to guarantee a higher response rate, the data collection work began by communicating with the companies selected for the sample via e-mail and sending an institutional invitation letter for their participation as a unit of analysis in the research study. In addition, a team was established to monitor the participation of the companies in all the strata considered in the sample in order to avoid sampling bias; this team also contributed to reducing the non-response rate in the closed-ended questionnaires by providing online advice.

The questionnaire was developed based on a review of the available scientific literature on the various components explored, as well as prior knowledge of the companies' realities, which supports and justifies that the variables integrated are relevant to achieving the goal stated. It is also worth noting that a team of researchers from the Polytechnic University of Cartagena, Spain, worked with researchers from the National University of Asunción, Paraguay, to adapt the instrument to the Paraguayan context, as the questionnaire was used in the Ibero-American MSME Observatory's study titled "Digitalization and Sustainable Development in Ibero-American MSMEs."

In order to measure the elements that drive or motivate the digitization of MSMEs in Paraguay, the survey used a 5-point Likert scale to determine the perception of entrepreneurs or company managers on their level of agreement or disagreement with the following aspects related to the digitization strategy:

- We are well aware of the possibilities and advantages of digitalization.
- We allocate significant resources to digitizing the business
- The business model is evaluated and updated with regard to digitalization.

- Our employees are prepared for the digital development of the company
- Our managers are well trained in digitalization
- The degree of process automation is high in my company
- We use digitization in the organizational management of the company
- We regularly organize training for digital transformation in our company

On the other hand, the sector, size, and age of the organization were regarded as characteristics that could influence the importance of the various digitalization drivers. In this sense, economic activities were classified according to the following sectors: manufacturing industries, services, and commerce; company size was classified based on the number of employees according to the national legislation in effect in Paraguay: 1 to 10 (microenterprises), 11 to 30 (small enterprises), and 31 to 50 (medium-sized enterprises). The firm's age is a dichotomous variable that takes the value 1 (mature companies) if the company has been in operation for more than 10 years, and otherwise takes the value 0 (young companies).

The size, age, and industry of the company were the variables used to look for significant differences in the identification of the drivers of digitalization. The difference in means was examined according to a classification criterion using analysis of variance (ANOVA), in order to determine the statistical significance of the differences observed in the variable of interest according to the classification factor utilized.

Results and Discussion

The findings of this study contribute to a better understanding and interpretation of the factors that motivate or drive the digitization of the Paraguayan MSMEs that were the subject of the study, keeping in mind that depending on the significance of each of these factors for the various businesses, a particular digitization strategy may be defined.

Figure 1: Degree of importance of digitalization drivers in MSMEs.



Source: original analysis based on sample data.

In this regard, Figure 1 first demonstrates that the knowledge that the owners or managers of these businesses have about the opportunities and advantages afforded by digitization (3.94 out of 5) is the key digitization driver in the MSMEs investigated. The managers of these organizations' strong digital training appear to be a driver in second position (3.48 out of 5). This is followed by the resources allocated to digitizing the business (3.11), the significance of employee preparation for digital business development (3.09), and, to a lesser extent, the assessment and updating of the business model (2.96) as well as the use of digitization in company management (2.97). The amount of process automation (2.69) and the ongoing training provided by the business for digital transformation (2.53), on the other hand, show the least weight.

The significance and impact of the aforementioned determinants are next examined in relation to the sizes of the organizations that were surveyed. With the exception of understanding of the potential and benefits of digitization, which is at 90%, Table 1 demonstrates considerable disparities in all of the drivers of digitization with respect to the economic sectors. These findings clearly illustrate how the service sector behaves differently from the trade and industrial sectors (all service sector values are greater than in the other sectors).

Table 1: Effects of digitization drivers by economic sector

Digitalization drivers	Industry	Commercial	Services	Sig.
We are well aware of the possibilities and advantages of digitalization	3,9	3,8	4,1	*
We allocate significant resources to digitizing the business	2,9	2,8	3,5	***
The business model is evaluated and updated in terms of digitalization	2,7	2,7	3,3	***
Our employees are prepared for the digital development of the company	2,8	2,9	3,4	***
Our managers are well trained in digitization	3,2	3,3	3,8	***
The degree of process automation is high in my company	2,5	2,4	3,0	***
We use digitization in the organizational management of the company	2,6	2,7	3,3	***
Training for digital transformation is regularly organized in our company	2,2	2,0	3,1	***

Statistically significant differences (*): $p < 0.1$; (**): $p < 0.05$; (***): $p < 0.01$; - not significant.

The results also reveal significant disparities in most of the drivers when the importance of the digitalization drivers is examined according to company size. In this sense, Table 2 indicates how medium-sized businesses behave differently from micro and small businesses. As a result, at 99%, there are noticeable variations in both the company's organizational management's adoption of digitalization and its high level of process automation. Next, a few drivers are seen in the context

of medium-sized businesses with considerable variations at 95% (resource investment to digitize the business, staff development for the digital age, and company training for digital transformation). While other drivers receive high ratings (possibilities and benefits of digitization 4.2 out of 5, company reviews and updates itself in digitization 3.3 out of 5, and managers are highly trained in digitization 3.7 out of 5), these evaluations do not have statistical significance.

Table 2: Impact of digitalization drivers by company size

Digitalization drivers	Micro	Small	Medium	Sig.
We are well aware of the possibilities and advantages of digitalization	3,9	4,0	4,2	-
We allocate significant resources to digitizing the business	3,0	3,1	3,6	**
The business model is evaluated and updated in terms of digitalization	2,9	3,0	3,3	-
Our employees are prepared for the digital development of the company	3,1	2,9	3,5	**
Our managers are well trained in digitization	3,4	3,6	3,7	-
The degree of process automation is high in my company	2,5	2,8	3,2	***
We use digitization in the organizational management of the company	2,8	3,1	3,7	***
Training for digital transformation is regularly organized in our company	2,4	2,5	3,0	**

Statistically significant differences (*): $p < 0.1$; (**): $p < 0.05$; (***): $p < 0.01$; - not significant.

Table 3: Impact of digitization drivers by company age

Digitalization drivers	Young Companies (≤ 10 años)	Older Companies (> 10 años)	Sig.
We are well aware of the possibilities and advantages of digitalization	4,0	3,8	*
We allocate significant resources to digitizing the business	3,2	3,0	-
The business model is evaluated and updated in terms of digitalization	3,0	2,9	-
Our employees are prepared for the digital development of the company	3,1	3,1	-
Our managers are well trained in digitization	3,6	3,3	*
The degree of process automation is high in my company	2,7	2,7	-
We use digitization in the organizational management of the company	2,9	3,1	-
Training for digital transformation is regularly organized in our company	2,5	2,6	-

Statistically significant differences (*): $p < 0.1$; (**): $p < 0.05$; (***): $p < 0.01$; - not significant.

However, when analyzing the digitization drivers according to the age of the companies (Table 3), statistical significance (at 90%) only appears in two digitalization drivers for young companies compared to mature companies (we are well aware of the possibilities and advantages of digitization; our managers are well trained in digitization).

Although the other digitalization drivers favor young companies more, two drivers favor mature companies more than young companies (digitization is used in organizational management, 3.1 out of 5; and the company regularly organizes digital transformation training, 2.6 out of 5). However, these drivers fail to show significant differences that would allow distinct behaviors to be identified across young and mature organizations.

Conclusions

The findings of this study demonstrate the importance and influence of digitization drivers in Paraguayan MSMEs, based on the percep-

tions of these companies' decision makers. First, it has been shown that one of the key drivers of digitization in these organizations is the owners' or entrepreneurs' knowledge of the potential and benefits presented by digitization, as well as their good digitization training. This condition may enable these businesses to develop and implement a business culture based on the incorporation of digital tools, making them more susceptible to a greater digital transformation in all business management processes. Given that the owners of these types of businesses perform the managerial, financial, and driving duties, it can be crucial to support the good training provided as well as to make sure that they are aware of the benefits and potential of digitization in order to move forward with greater dedication to this process. In this sense, although the degree of knowledge and training is one of the most important drivers expressed by the owners, there are no substantial differences when we look at it by sector, size, or age, which leads us to conclude that these drivers are not being applied in business practices or are not elements used for the digitization strategies

of MSMEs at present. However, despite the existence of these favorable drivers, they could be slowed down or delayed by certain barriers facing the digitization process in the country, such as high investment costs and limited financial resources for business growth in these types of companies. A closer interest of the responsible government institutions through more focused strategies, reflected, for example, in better access to financial products for digital development and greater support from the Ministry of Information Technology and Communications in coverage and quality of the internet, could improve the reality of these companies in terms of deepening digitization strategies and competitiveness.

Second, it appears that the resources allocated to company digitalization are also important in these firms, as indicated by the owners interviewed and as observed in the results. However, it is unclear if these resources are geared toward the use of basic digital technologies or the incorporation of increasingly advanced digital technologies. Finally, personnel preparation for digital company development appears with a relevant valuation in these companies. These two critical factors (earmarked resources and prepared employees) are major motivators for these businesses to adopt more digitization methods. On the other hand, the results obtained by studying the impact of digitalization drivers in connection to the sectors, sizes, and ages of the companies reveal intriguing patterns that can aid in better understanding the asymmetry of this process in the context studied. Thus, at the sectoral level, service sector enterprises exhibit a significantly higher level of digitization and valuing of digital drivers. Furthermore, it is clear that the services sector is the one that most positively values and incorporates drivers into business processes, and we can assume that this situation may have an impact on the greater competitiveness of this sector in terms of digitization, compared to MSMEs in commerce and industry.

When we look at size, we find a similar pattern, as the results suggest that larger organizations (medium-sized companies) embrace more digital technology and place a higher value on digitalization drivers (all values are higher when compared to micro and small enterprises). Perhaps because they are larger enterprises under competitive pressure, they devote more resources to digitization. On the other hand, it is clear that micro and small businesses continue to have limits in this area, and a greater effort and attention on implementing digitalization into their business operations is recommended, as this might produce greater competitive advantages for their businesses.

However, the age of the companies does not appear to be a differentiating factor when it comes to the inclusion of digital operations. Although it is expected in this situation that young enterprises are associated with young businessmen or entrepreneurs who are called digital natives, they do not generate differential behaviors when studied according to their age due to specific circumstances. In this regard, mature companies may have superior digitalization strategies than younger ones because of their greater market experience.

Finally, consistent with the main purpose of the study to analyze the effects of digitization in the context of MSMEs, we can positively

conclude that the importance given to the drivers or motivators of digitization in Paraguayan MSMEs is relatively high, which implies a positive baseline for advancing in this process. However, there are economic sectors and especially smaller companies (micro and small enterprises) that are lagging behind in relation to the effective incorporation of digitization in their businesses, which somehow limits business results as well as the competitiveness of these companies.

Implications

According to this research study's findings, it is clear that some economic sectors need more assistance from the Ministry of Information Technologies and Communications (MITIC) in coordination with the Vice-Ministry of MSMEs in order to digitalize their processes. This assistance could come in the form of plans that can better integrate smaller businesses (micro and small) with the industrial and commercial sectors.

Several MSME sectors have yet to embrace the National ICT Plan 2022–2030 (PNTIC) in this area. This plan aims to build a connected, digital, and safe country where bridging access gaps to ICTs (information and communication technologies) ensures equal access to all State services, transparency in public administration, and economic competitiveness by fostering human talent with both basic and advanced skills, as well as the production of ICT goods and services and the digital transformation of all industries. This national policy may prove to be an essential tool for accelerating the causes driving digitalization in the examined industries, facilitating and encouraging a quicker transition to the digital transformation of MSMEs in Paraguay.

Limitations

This study is not without limitations; although the sample includes companies from all over the country, it may not be sufficiently representative, considering that the sample was selected by convenience.

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