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Reconfiguration of Technological and Innovation Capabilities in Mexican SMEs: Effective Strategies for Corporate Performance in Emerging Economies

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Abstract: Latin American SMEs currently have serious financial and technological limitations. These problems have generated poor progress in technological digitization, innovation management, and corporate performance. The purpose of this research is to first analyze the direct effect that digitalization has on the management of innovation and corporate performance of Mexican SMEs. Secondly, the moderating effect that technological barriers have on the digitization, innovation, and results of the corporate performances of Mexican SMEs is examined. This study compiles information from a sample of 4121 managers of SMEs in the service trade and manufacturing sector. The information collection technique was through a personal interview (online questionnaire) addressed to the owner and/or manager of the SMEs through the LimeSurvey Professional platform. The fieldwork was carried out during the months of January to July of the year 2022. The structural equations model (SEM) was used for data analysis, specifically with the statistical technique of analysis of variance through the partial least square (PLS). The findings revealed that digitization has positive and significant effects on innovation management and corporate performance. In addition, the results indicate that the barriers to digitalization as a moderating variable have been impeding development and digital transformation and reducing the results of innovation and corporate performance of Mexican SMEs. This study contributes to the development of dynamic capabilities theory.

Keywords: digital; innovation; performance; SMEs

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1. Introduction

The current situation that society is going through on the planet includes extremely complex economic crises, technological advances, environmental problems, and global diseases that have caused exponential chaos (Lee and Trimi 2021; Alcalde-Heras et al. 2019). For this reason, companies and more small and medium enterprises (SMEs) are facing great challenges and struggling in an uncertain and increasingly changing scenario, which are attributed to the appearance of megatrends (Elhusseiny and Crispim 2022; Vargas et al. 2022) and the COVID-19 disease caused by the new coronavirus known as SARS-CoV-2 (World Bank 2021b). To minimize these effects and be in the competitive fight, SMEs are directing their resources and capabilities toward the implementation of technology and betting on the development of innovation practices (Teece 2014). The technological revolution based on digitization is changing the daily life of people, the internal processes of companies (remote work, humanization, and dehumanization of employees and organizational resilience) (World Bank 2021a; Khurana et al. 2022; Zighan and Ruel 2021), the ways to market your products and/or services with customers (use of digital platforms and social media) (Caballero-Morales 2021; Effendi et al. 2020), relations with other companies, and commercial transactions with suppliers (Tian et al. 2022; Ulas 2019). The novelty of these strategies has prompted organizations to invest in the development and implementation of digital technologies; the paradox is that sometimes the results are not as expected. This can

originate due to multiple internal and external factors (Gebauer et al. 2020; Tian et al. 2022). Companies today are reconfiguring their strategies to make the most of opportunities with their existing resources, giving rise to the development of a dynamic capability (Gassmann et al. 2010; Teece 2010). Creative innovation in companies is vital for digital transformation, which is why the literature has stated that this strategy is a task and responsibility of managers of an organization (Drucker 2014). In today's highly competitive market, SMEs seek to take advantage of opportunities through the use of technologies to strengthen their business models and achieve exponential changes through creative destruction that leads them to higher levels of innovation (Teece 2018). In short, digital technology encourages competitive advantage and strengthens open innovation processes, which are understood as internal and external knowledge flows that accelerate internal innovation to expand markets (Chesbrough 2006). However, due to the multiple limitations that SMEs present, digitization and innovation practices have been underdeveloped, becoming a pending task and latent priority for managers. In accordance with Hussein Magdy Elhusseiny and Crispim (2022), the main challenges and barriers faced by SMEs for digitization are (1) technical, (2) organizational, (3) technological, and (4) legal. Regarding the barriers to the development of innovation in SMEs, scholars such as Teece (2018); Al-Hanakta et al. (2021); Indrawati et al. (2020); and Jensen et al. (2007) have shown that the main obstacles are (1) a lack of government support, (2) a lack of sufficient financial capital, (3) little investment in the development of innovation, (4) a lack of commitment from managers and employees. These challenges are even more acute in Latin American SMEs and emerging economies due to the structural fragility and poor economic positioning of these regions (OECD 2020). Data issued by the Economic Commission for Latin America (CEPAL 2020) and the Caribbean and by the World Intellectual Property Organization (WIPO 2022) state that the Latin American region is positioned at an intermediate level of development compared to other regions of the world in terms of the development of its digital ecosystem and innovation. Undoubtedly, new technologies have arrived to revolutionize the internal and external processes of companies. The digitization of internal processes offers better business ideas, new market opportunities, and disruptive actions that become high-impact innovations (Ferreira et al. 2019; Ritter and Pedersen 2020). For this reason, the recent literature considers technological digitization as a strategic means not only to generate innovation but also to transfer knowledge and improve organizational performance. In short, SMEs face greater challenges to adopt technological digitization and innovation strategies. At present, many theorists and professionals in the subject are focusing their knowledge and putting greater interest in this business topic. However, there is still a gap in the benefits and business opportunities that can be obtained for SMEs in the field of digitalization and innovation management (Ferreira et al. 2019; Liu et al. 2023; Thomas Ritter and Pedersen 2020). Although technological digitization and innovation strategies are not new phenomena, this process continues to evolve and produce novel effects on how to do business. Consequently, the effects of digitization through innovation management on corporate performance is still a little-explored field in the SME sector (Ferreira et al. 2019; Liu et al. 2023; Scuotto et al. 2021). Therefore, it is important to ask the following questions: 1. "Is digitization a business strategy that promotes and improves the corporate performance of Mexican SMEs?" and 2. "Is innovation management a business strategy that moderates the relationship between digitization and corporate performance?". The purpose of this research is first to analyze the direct effect of digitalization on the management of innovation and the corporate performance of Mexican SMEs. Secondly, the moderating effect that technological barriers have on digitization, innovation, and the results of the corporate performance of Mexican SMEs is examined. This research has a notable relevance from two perspectives: (1) we emphasize that the topics under study are highly important for the development and growth of SMEs in an emerging economy given that most of the studies exposed by the literature focus on large organizations, developed economies, and in high technology sectors; (2) the variables under study are analyzed from the perspective of the theory of dynamic capabilities (TDC) as reconfiguration strategies

in a highly complex scenario due to the implications and consequences of COVID-19. In addition, from a methodological context, our study contributes to a gap in the literature by analyzing the effects of moderation (technological barriers) and mediation (innovation management) on digitization and corporate performance in SMEs. This article has been structured as follows: The first part presents the theoretical review, the empirical review, and the development of the hypotheses. Second, the methodology used, the sample, and its characteristics are explained as well as the justification of the variables under study. Finally, the results, discussions, conclusions, and future lines of research are shown.

2. Literature Review and Hypothesis

The literature has shown that the evolution and growth of organizations have been analyzed from different theoretical currents, mainly from the factors and/or internal and/or external resources that affect the competitiveness of companies. The dynamic capabilities theoretical approach brings together the two perspectives, thereby filling a gap in the literature (Rindova et al. 2016; Farzaneh et al. 2022; Jafari-Sadeghi et al. 2021). Therefore, the analysis of organizational growth and development to achieve competitive advantage is based on the reconfiguration of its resources and capabilities. In accordance with Teece (2007), capabilities can be leveraged to create, extend, update, protect, and maintain business assets on an ongoing basis. For analytical purposes, dynamic capabilities can be classified into the ability: (1) to detect opportunities and threats; (2) to take advantage of opportunities, and (3) to maintain competitiveness by improving, combining, protecting, and, when necessary, reconfiguring the intangible and tangible assets of an organization (Newey and Zahra 2009; Augier and Teece 2007). Some of the key resources within the theoretical model of dynamic capabilities are technology and innovation. These capabilities are essential in the reconfiguration of strategies in business models, which are focused on creating value for customers, improving the designs of the products and/or services offered by the company, and the efficient definition of market segments (Bogers et al. 2019; Teece 2010). Digitization is part of an organizational information system where the company's technological capabilities are used (Eliakis et al. 2020). Digitization is conceived as the design and application of solutions based on information technologies by individuals, organizations, and society to increase user experience, efficiency, and effectiveness (Alt 2018). The term digitization is very controversial in the literature and turns out to be very broad and has different meanings depending on the context of its application. Furthermore, it is important to distinguish between the terms "digitalization" and "digital transformation" since they are concepts that describe different ideas. Digitization is the technological transfer of information (flows) and the tasks that are carried out on a technological computer (computer). In the business context, digital transformation goes much further and describes the process of change due to the increased use of information technology (IT) (Chanias and Hess 2016; Gebauer et al. 2020; Ulas 2019). According to Chanias and Hess (2016), the concept immediately reflects the IT-driven changes that descend on business processes, such as production, marketing, sales, support activities, and human resource management. The concept also deals with a company's ability to manage the digital transformation process systematically. In business, the level of speed of digital transformation is determined in terms of consumer market demands. With the support of technology, consumer satisfaction is reduced. This implies that the start of product design to manufacturing and the time to market are reduced, and the diversity of products that quickly meet consumer demands is made possible with efficient, optimal, and faster decision processes based on numerical data at every step of the manufacturing process (Dąbrowska et al. 2022). This process provides productivity growth for operations and reduces costs (Warner and Wäger 2019). Classic business models are disappearing and being replaced by new, flexible business models, which are modifiable instantly, responding to the needs and habits of consumers in real-time. These models are based on knowledge, technology, and innovation (Bouwman et al. 2019). Digital transformation facilitates the emergence of enterprises and strengthens SMEs by providing new opportunities to improve

their competitiveness in local and global markets through product or service innovation and process improvement (Crupi et al. 2020).

With the incursion of new technologies in companies, innovation management has been constantly increasing (Bernal et al. 2019). The *Oslo Handbook of OECD* (2018) considers an innovation a new or improved product and/or process (or a combination of both) that differs significantly from previous products and/or processes and that have been placed on the market for the disposal of potential users (product) or put into use by the unit (process) while innovation activities include all commercial, financial, and development practices carried out by a company that aims to generate innovation (OECD 2018). From the perspective of Jensen et al. (2007), innovation can be visualized in two modalities (technological and nontechnological). The first is based on science and technology (STI) for the development of a relevant product based on high research and development expenses, including investments in human resources and technologies. This innovation is supported by interactions and relationships with centers that produce new knowledge (research centers and universities) and generate codified and explicit knowledge that can be used by the company to produce innovations (Haus-Reve et al. 2022). The second approach stresses the importance of practice- and interaction-based innovation that relies on learning by doing, using, and interacting (DUI). In this modality, innovation is generated mainly by organizational capacity through formal and informal exchanges internal to the company but also with interactions between suppliers, customers, and competitors (Haus-Reve et al. 2022). Without a doubt, digital or technological transformation in organizations is on the rise (Oesterreich et al. 2022). However, to achieve a true digital transformation, effective innovation management is necessary and also a corporate philosophy with a strategic vision, effective leadership for managing resources and capabilities, collaborative work, integration of technology, and technological literacy (Chanias and Hess 2016). With this, an organization could reach a level of digital maturity. This can be described by to what extent the tasks of a company are carried out and the information flows are managed through technologies (Vagadia 2020). Following the technological perspective, a company would be completely digital by performing all tasks and storing all information using IT.

2.1. Digitization and Innovation in SMEs

The incorporation of digitization into daily life has been gradual since its inception. As technology has innovated the way people obtain information, communicate, interact, and do business, its use has increased globally, contributing to the development of society (Salcedo-Mendoza et al. 2018). Katz and Koutroumpis (2013) agree that digitalization simplifies the social transformation produced by the massive adoption of digital technologies that generate, process, and transfer information. According to Nambisan et al. (2017), digital innovation and digital technologies form an inherent part of a new idea, its development, and its diffusion. Innovation is increasingly seen as a business requirement; however, its real challenge lies in managing the change process (Abu El-Ella et al. 2015). Digitization is a driver of innovation in the development of business models and a key factor in facilitating sustainable economic success. For this, it is necessary to understand current businesses and identify the drivers of digital innovation (Bleicher and Stanley 2016). Digital entrepreneurship and innovation become an intersection of digital technologies with traditional entrepreneurship and innovation processes and outcomes, both of which feed off the potentially transformative changes that digital technologies bring (Berger et al. 2021). Creating a cycle of business innovation through a network allows us to measure, predict, and understand the ability of a company to create value for the customer through the commercial use of digital networks (Wheeler 2002). Digitization is a factor that strongly influences the implementation of innovation processes; SMEs must be aware of how digital transformation affects their environment (Hosan et al. 2022). Digitization enables effective business decisions and optimization of business processes (Valiyev et al. 2022). There are solid arguments that show that through digital platforms, new technologies generate new ways of working and encourage practices with employees and customers and increase the

performance of innovation in companies (Khattak et al. 2021). Recent studies also affirm that digitization in SMEs generates a culture of innovation and operations focusing on improving products and services to satisfy their customers (Khattak 2022). Some experts on the subject of digitization in SMEs have shown that in order to obtain innovation capabilities and an efficient result of innovative performance, in addition to tangible resources, it is necessary for companies to display leadership focused on the efficient use of new technologies, such as social networks and digital platforms (Borah et al. 2022; Wu et al. 2022).

Hypothesis 1 (H1). *A higher level of digitization generates an increase in innovation activities in Mexican SMEs.*

2.2. Digitization and Corporate Performance in SMEs

Enterprise digitization has become an important topic in management practice. How a digital business strategy translates into performance depends on additional factors that are internal and external to the company (Leischnig et al. 2016; Wang and Kim 2017); hence, a digital strategic plan allows for creating a clear trajectory for SMEs in achieving performance and maintaining sustainability (Doz and Kosonen 2010). An increase in the breadth and depth of social networks positively influences the financial performance of a business, allowing it to quickly adapt to changing markets (Du and Jiang 2015; Bunten 2018). Companies that primarily serve business customers and operate in a technological environment should engage in the use of social media to access relevant information as much as possible, thus achieving improved marketing performance and effectiveness and efficiency of management decisions (Leischnig et al. 2016; Alonso-Dos-Santos et al. 2020; Rozak et al. 2021). Better measurement of digitization will enable a clearer analysis of the performance implications of digitization (Ritter and Pedersen 2020). Lai et al. (2010) and Syam and Sharma (2018) affirm that digitization has a positive impact on logistics performance just as artificial intelligence has on sales practices. A company's digital strength should be harnessed in digital innovation which, in turn, could drive company performance (Khin and Ho 2019). In the digital age, companies and the economy are more susceptible to change, and this forces them to use digitization. Phenomena such as the COVID-19 pandemic forced companies to change their way of working, using technological platforms that allowed a faster response to customer needs (Kumar et al. 2021; Hosan et al. 2022).

Hypothesis 2 (H2). *A higher level of digitization generates an increase in innovation activities in Mexican SMEs.*

2.3. Innovation and Corporate Performance in SMEs

In this age of constant motion, established companies are challenged to develop new insights that are necessary to shift to a new technology path; as technology improves, so does performance (Benner 2009). Innovation in products and processes exerts a positive influence on the performance of organizations in addition to the growth of the company (Geroski and Machin 1992; Albarracín and De Lema 2012). As part of new management approaches, SMEs must pay attention to innovation and technological adaptation related to products and services, which determine the survival, growth, and development of their profitability (Indrawati et al. 2020; Meng et al. 2021; Łobacz and Tylżanowski 2022). Innovation can improve firm performance by producing a better market position that conveys a competitive advantage (Ferreira and Coelho 2020); likewise, it is important to highlight that innovation impacts not only the functional performance of a good or service but can also influence intellectual performance (Stoneman 2010). According to Pil and Holweg (2003) and Ramaswamy and Prahalad (2004), innovation is the key driver of modern companies to achieve growth, development, business efficiency, and performance as well as a system that enables successful organizations to learn how to meet customer demands and improve performance. Digitization is an important driver of the innovation management process, providing a competitive advantage, higher productivity, and better

rates of return as well as a faster response to changing customer needs (Del Vecchio et al. 2018; Łobacz and Tylżanowski 2022). In most emerging economies, the digitization process is advancing rapidly, the economy is accelerating, and economic performance is being boosted (Hosan et al. 2022). The adoption of digital technologies is positively associated with the strategies of SMEs to respond to public crises, such as the COVID-19 outbreak. This indicates that having a higher degree of digitization means an SME is more likely to adopt effective response tactics and achieve better performance (Guo et al. 2020). SMEs that choose to create real-time interactions with their customers develop key performance indicators as well as foster innovation in digital marketing, facilitate the use and adoption of digital technology (Ullah et al. 2021), and increase their level of competitiveness and profitability (Saunila 2019). In short, there is empirical evidence that innovation activities in any of their modalities (incremental or radical) generate positive changes in the financial and organizational results of companies (Zhang 2022). Therefore, SMEs are adopting new practices to generate innovative ideas and practices that lead them to improve their processes, improve their products, increase their client portfolio, increase sales, and thereby increase corporate performance results (Cuevas-Vargas et al. 2022; Latifi et al. 2021).

Hypothesis 3 (H3). *A higher level of innovation management generates an increased corporate performance result in Mexican SMEs.*

2.4. Barriers That Affect Digitization, Innovation, and Corporate Performance of SME

Having knowledge about the possible barriers to digitization is important to carry out an analysis of the risks of its implementation (Elhusseiny and Crispim 2022). Coordinating team skills can be a barrier to digitalization in the process of innovation (Adomako et al. 2021) as well as the uncertainty in the money invested, unforeseen technical problems (Coreynen et al. 2017), and even data hacking and privacy issues (Rymaszewska et al. 2017). Advanced digital equipment vendors face managerial dilemmas such as customer proximity and technology simplification when developing service-based growth strategies (Raja et al. 2017). Digitization on cloud-based platforms allows for the possibility to innovate services for manufacturers, suppliers, and users (Zheng et al. 2018) and obtain benefits such as increases in sales or productivity, innovations in value creation as well as new ways of interacting with customers (Matt et al. 2015). However, this will require entirely new skills, resources, and collaborations as well as changes in innovation management and technology systems (Lerch and Gotsch 2015). The inability of organizations to handle big data, the complexity of information, and the technological competence of organizations are also barriers to adoption and innovation (Kim et al. 2018). According to Ullah et al. (2021) and Hosan et al. (2022), barriers to digitalization faced by SMEs include the unwillingness to invest in digital technologies, lack of funds for innovation, high technology costs, lack of qualified personnel, and lack of free time to undertake innovative activities.

Hypothesis 4 (H4). *An increase in barriers to digitization exerts a moderating effect on the relationship between digitization and innovation in Mexican SMEs.*

The use of digital technologies can increase the performance and competitiveness of companies (Marcon et al. 2019). However, the lack of government support, financial incentives, and policies and standards in a company are considered barriers to the adoption of digital technologies that prevent improving performance (Ullah et al. 2021). Strategic decisions on digital transformation do not automatically improve performance; SMEs must rethink and change their traditional business model to overcome important barriers in an increasingly competitive environment (Bouwman et al. 2019; Peillon and Dubruc 2019). The lack of an overall digitalization strategy is one of the biggest obstacles to business profitability; neglecting digital transformation could risk losing the game in highly competitive markets (Parviainen et al. 2017). In the case of companies that start the implementation of digital technologies, they face the fact that the growth in their use

will lead to a decrease in sustainable development and extreme changes that this digital transformation will bring with it (Schwer and Hitz 2018; Hoa and Tuyen 2021). Businesses must be able to adapt to a world that is changing faster and faster in order to make money from business opportunities (Schwer and Hitz 2018). There are difficulties that SMEs face at the time of their transition to digitization. These include organizational, technological, and legal barriers (Elhusseiny and Crispim 2022), the same that include the lack of financial resources, lack of knowledge in the use of technological services, and privacy problems (Hosan et al. 2022).

Hypothesis 5 (H5). *An increase in the barriers to digitization exerts a moderating effect on the relationship between digitization and the corporate performance of Mexican SMEs.*

There are strong barriers to digitization that affect business innovation, reducing its level of profitability. Small businesses often lack the resources and managerial vision to fully understand the impacts of digital transformation (Bouwman et al. 2019); investment in digitalization is highly dependent on the financial performance of companies, and they often have limited resources to use in this area (Eller et al. 2020; Ullah et al. 2021). Business performance can be significantly affected by changes in the business model, and companies that focus more on innovation outperform those that do not (Giesen et al. 2010). Resistance to technology adoption and lack of demand discourage small businesses (Ullah et al. 2021) due to the high cost of digital technologies (Hoa and Tuyen 2021; Valiyev et al. 2022). Giotopoulos et al. (2017) and Kazan et al. (2018) argue that SMEs face unique challenges in implementing digital platforms because they may lack the necessary resources, skills, and commitment that challenges company performance. Understanding of the performance implications of implementing digital platforms is poor, and many companies' digitization efforts are unsuccessful (De Reuver et al. 2018). This lack of success is especially relevant for entrepreneurial SMEs due to their limitation of being small, which creates unique challenges (Giotopoulos et al. 2017). Small- and medium-sized enterprises are said to face challenges when changing parts of their value chain into smart manufacturing with the means of digitization (Gebauer et al. 2023). Among these challenges are the regulatory barriers that represent a significant obstacle to the innovative development of SMEs (Valiyev et al. 2022) and the lack of internal technology experience (Dutta et al. 2022). In the same way, an unstable economy is an additional impediment to technological innovation for SMEs (Indrawati et al. 2020; Saleh and Manjunath 2021).

Hypothesis 6 (H6). *An increase in the barriers to digitization exerts a moderating effect on the relationship between innovation and the profitability results of Mexican SMEs. Derived from the theoretical and empirical review in* Figure 1*, the operational model of the research is shown.*

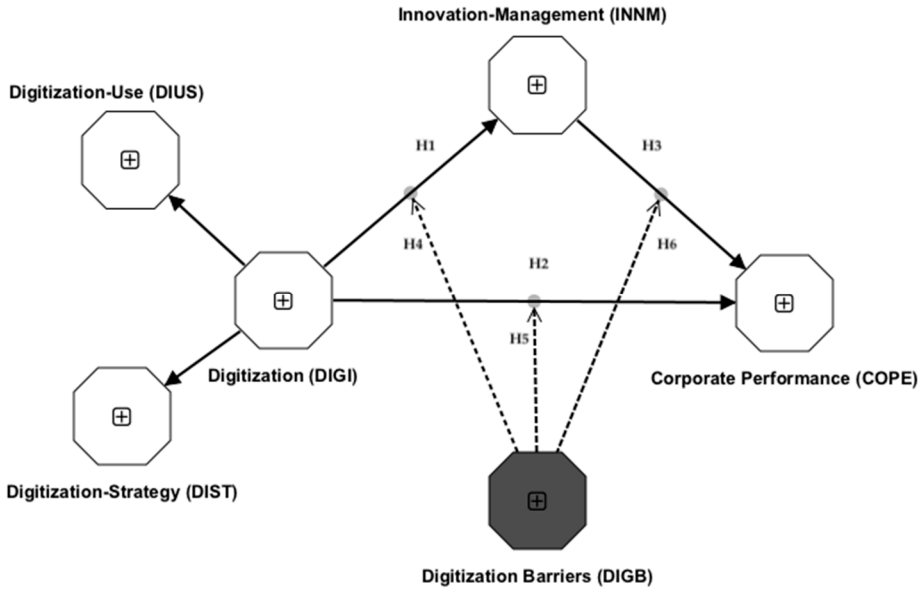

Figure 1. Nomogram of this study.

3. Materials and Methods

The operational model of the research was analyzed with the structural equations model (SEM), specifically with the statistical technique of analysis of variance through the partial least square (PLS). This multivariate statistical technique works with blocks of variables (components) and estimates the model parameters by maximizing the explained variance of all the dependent variables (both latent and observed) (Chin 1998). The research is quantitative, conclusive, and explanatory in order to examine how and why a certain empirical phenomenon occurs (Henseler et al. 2016). The PLS-SEM statistical technique was chosen according to the objective of the research and the nature of the constructs of the operating model of this research. In addition, PLS-SEM has been frequently used for the analysis of individual and group behavior (Sosik et al. 2009); it is also used in strategic business management (Hair et al. 2019), information systems, and other disciplines related to organizational performance (Benitez et al. 2020). This section describes the subjects (Mexican SMEs) that participated in this study (sample), the validation of the constructs, the dimensions that make up the questionnaire used, and the method for its validation.

3.1. Sample

This study is of a quantitative type with a predictive approach in which companies are analyzed according to the activity sector and size. The data were issued by the OECD (2022) in Mexico before the COVID-19 pandemic. There were more than 4.86 million micro-, small-, and medium-sized enterprises, of which, 96.6% were microenterprises, which generated 51. 6% of the gross domestic product (GDP) and employed almost 70.0% of the labor force in the country. As a result of the confinement measures due to the COVID-19 pandemic in 2020, many businesses were forced to stop their activities and, in some cases, reached definitive closure. Despite the global disruption, some businesses found economic opportunities to reconvert their activities and adapt them to the new circumstances. However, even though some businesses adapted to the new behavior and demands of the consumer, a reduction of 8.06% of the total population of SMEs was registered between May 2019 and September 2020. Currently, with the post-COVID-19 policies implemented to reactivate the economy, Mexico has 4.47 million SMEs, of which, 94.1% are microenterprises. However, businesses born in the year 2020 have an average of 2 employees while establishments closed during the same year had an average of 3 employees. The companies selected for this study are geographically established in the northern, central, and southern regions of Mexico. According to the national statistical directory of economic units INEGI (2019), in these

regions, there are approximately 1,445,803 companies ranging from 5 to 250 employees. The sample size was determined so that the maximum margin of error for estimating a proportion was less than 0.02 points with a confidence level of 95.0%. The information collection technique was through a personal interview (online questionnaire) addressed to the owners and/or managers of the SMEs through the LimeSurvey Professional platform. The fieldwork was carried out during the months of January to July of the year 2022. Finally, a sample of 4121 answered surveys were obtained. The sectors that participated in this study were 1628 service companies (39.5%), 1373 trade companies (33.3%), and 1120 manufacturing companies (27.2%). Moreover, 54.7% corresponded to microbusinesses, 25.5% were small businesses, and 19.8% were medium-sized businesses (see Table 1). The management of these companies was represented by 37.5% by women and 62.5% by men. A total of 2432 companies were of family origin (59.0%), and 1689 were nonfamily companies (41.0%).

Table 1. Sample Characteristics.

Sector	Frequency	Micro	Small	Medium	Total	%
Services	1628	1082	335	211	1628	39.5%
Trade	1373	834	381	158	1373	33.3%
Manufacture	1120	338	358	424	1120	27.2%
Total	4121	2254	1074	793	4121	100.0%

3.2. Questionnaire Validation

To validate the questionnaire, an exhaustive review of the literature was considered, and a pilot test and statistical validation of this study's constructs were also carried out. For content validation, the most representative theorists who developed the constructs and scales to measure the variables of the proposed model were considered. To refine the relevance and coherence of the questions of each item, prior to the pilot test, an expert validation was carried out using the Delphi method in which 5 researchers from the Strategic Foundation for the Development of Small Businesses (FAEDPYME) participated. The experts evaluated the items of all the constructs of the questionnaire on a scale of 1 to 5 (not at all relevant to very relevant); the items that failed to obtain a mean relevance index equal to or greater than 3.75 were discarded (Powell 2003; Okoli and Pawlowski 2004). The second validation was through a pilot test with 5.0% of the total sample to check the wording, consistency, and coherence of the items of each construct exposed in the questionnaire through a 5-point Likert-type scale. Regarding statistical validation, it was decided to check the nonresponse bias through the variance of the common method. This type of analysis is highly recommended for instruments with variables that measure the behavior, aptitudes, values, or judgment of individuals (Reio 2010). For this study, we chose to analyze the common method variance (CMV) through the Harman one-factor test (Podsakoff et al. 2003; Malhotra et al. 2006). This procedure is carried out through an exploratory factorial analysis with all the variables of the model, considering the outputs of the nonrotated factorial matrix. The results show that the model is grouped into 6 factors with a KMO: 0.962, Bartlett's Sphericity Test, significant at 99.0%, and a total explained variance of 66.79%. The first factor of the model that explains the dependent variable (business performance) is 34.39%, so the presence of nonresponse bias is ruled out. Additionally, in the exploratory factorial analysis, all the items were included and concentrated in a single factor with the purpose of evaluating the CMV; the results show that the total explained variance is 35.33% (it does not exceed the value of 50%). As an additional test to combat CMV, we followed the recommendations of Bagozzi and Yi (1988) and Brahma (2009). These researchers propose to carry out the latent variable correlation matrix procedure for models built and analyzed using PLS-SEM. In their conclusions and suggestions, they propose that the value of the correlations between the constructs should be less than or equal to 0.9. According to the analysis of the Harman test and the analysis

of the correlation matrix, the results of our model confirm that CMV is not a problem for this study (see Table 2).

Table 2. Correlation matrix of the constructs.

Construct	COPE	DIGI	DIGB	INNM
COPE	1.000	0.274	0.244	0.514
DIGI	0.274	1.000	0.513	0.432
DIGB	0.244	0.513	1.000	0.386
INNM	0.514	0.432	0.386	1.000

Note: corporate performance (COPE), digitization (DIGI), digitization barriers (DIGB), digitization strategy (DIST), digitization use (DIUS), innovation management (INNM).

3.3. Measurement of Variables

The variables of the theoretical model under study were analyzed as first order constructs in mode A through partial least square consistent (PLSc) analysis. The SEM-PLS method was chosen for this research due to the following factors: (1) the nature of the items is of a reflective type, (2) it adapts to the design of the quantitative–explanatory type of research, and (3) the size of the sample and the robustness of the model with first and second order constructs (Hair et al. 2019). To analyze the statistical data of the proposed theoretical model, the method based on variance was used through the system equation model using partial least squares (SEM-PLS). To measure the second-order constructs, the two-stage approach method was used. In this process, it is based on the construction method through the scores of the latent variables. In the first phase, the aggregate loads of the first-order dimensions are estimated, and in the second stage, these aggregate loads are used to model the second-order construct (Wright et al. 2012; Cepeda-Carrión et al. 2022). The SmartPLS Professional version 4 software was used to analyze the measurement model and structural model. The factorial loads of all the first-order constructs are very close and above the value of 0.707 (Hair et al. 2019). In addition, the multicollinearity analysis was carried out through the statistical test of the variance inflation factor (VIF); the values of the items of the research model are below 3.3 (Diamantopoulos and Siguaw 2006). The items of the questionnaire were measured using a 5-point Likert-type scale (see Appendix A).

3.3.1. Digitization (DIGI)

This variable was measured considering the main theorists on the subject of technological capabilities at the organizational level and its relationship with the theory of dynamic capabilities (Teece 2009). Considering previous studies, this construct was measured in a second-order multidimensional way divided into (1) digitization strategies (measured with 7 items) and (2) use of digitization (measured with 7 items). For this, the studies developed by Alt (2018), Vagadia (2020), and Schuh et al. (2020) were referenced. For the correct assessment and measurement of the items, a 5-point Likert-type scale was used: 1 = not very important and 5 = very important in the last 2 years.

3.3.2. Innovation Management (INNM)

This variable was measured considering the main theorists on the subject of innovation and its relationship with technology in organizations as a reconfiguration strategy toward dynamic capabilities (Teece 2009, 2010). Considering previous studies, this variable was measured in a unidimensional way of first order. Innovation management is composed of: (1) product innovation, (2) process innovation, and (3) organizational innovation (measured with 7 items). For its correct measurement, the Oslo Manual (OECD 2018) and the DUI model (Jensen et al. 2007) were taken as references. For the correct measurement of the elements, a 5-point Likert-type scale was obtained: 1 = not very important and 5 = very important in the last 2 years.

3.3.3. Corporate Performance (COPE)

Objective measures of corporate performance, such as return on assets, return on sales, and return on equity, have had significant problems because they have a short-term focus, are not risk-adjusted, and are difficult to relate to innovation activities (Parida et al. 2014; Azam 2015). Accounting measures are also based on historical costs and therefore may not accurately reflect their measurement (OECD 2017; Teece 2016). Considering previous studies, from a theoretical-conceptual point of view, this variable was a first-order unidimensional measure. In our study, we have considered the managers' perceptions of the results that emerge from financial performance in the last 2 years. This variable was measured with 6 elements considered in the studies developed by Aras et al. (2010) and Quinn and Rohrbaugh (2011). For the measurement, a 5-point Likert-type scale was obtained with 1 = poor performance and 5 = high performance in the last 2 years.

3.3.4. Digitization Barriers (DIGB)

This variable was measured considering the theoretical references to technology and organizational innovation. Considering previous studies related to the barriers to digitization in organizations, this variable was measured in a first-order unidimensional way. The digitalization barriers in the SMEs analyzed for our study are human and technological barriers (Elhusseiny and Crispim 2022; OECD 2019). For the correct measurement of this variable, 8 items were designed, taking as reference the studies developed by Marcon et al. (2019), Indrawati et al. (2020), and Oesterreich et al. (2022). For the measurement of these items, a 5-point Likert-type scale was considered: 1 = not very important and 5 = very important in the last 2 years.

4. Results

4.1. Measurement Model

For the confidence and validity of the constructs of the research model, analysis of the values of the indicators was carried out: (1) Cronbach Alpha (CA), (2) rho_a_c, (3) composite reliability (CR), (4) convergent validity, and (5) discriminant validity. The values of the indicators of our model are above 0.8 for the pre-established parameters (Hair et al. 2019). It is also verified that the model shows a convergent validity through the analysis of the average variance extracted (AVE); this is due to the fact that all the constructs exceed the value of 50% (see Table 3) (Benitez et al. 2020; Henseler et al. 2015).

Table 3. Reliability and validity of the constructs.

Construct	Cronbach Alpha	rho_a	rho_c	AVE
COPE	0.873	0.874	0.904	0.612
DIGI	0.942	0.944	0.950	0.593
DIGB	0.913	0.913	0.929	0.622
DIST	0.942	0.942	0.953	0.742
DIUS	0.910	0.915	0.929	0.652
INNM	0.930	0.931	0.944	0.706

For the analysis of discriminant validity, we initially followed the Fornell and Larcker criterion. This test indicates that the square root of the AVE (the values on the diagonal are the square root of the shared variance between the construct and its measures) of a construct must be greater than the connections it has with any other construct (Fornell and Larcker 1981; Henseler et al. 2015). The amount of variance that a construct of its indicators (AVE) shows must be greater than the variance that said construct shares with other indicators of the model (squared correlation between the two constructs) (Henseler et al. 2015). In Table 4, it can be seen that it complies with this criterion.

Table 4. Discriminant validity of the model: Fornell and Larcker criterion.

Construct	COPE	DIGI	DIGB	INNM
COPE	0.782			
DIGI	0.274	0.770		
DIGB	0.244	0.513	0.788	
INNM	0.514	0.432	0.386	0.840

To strengthen this section, we have added another discriminant validity test through the analysis of the heterotrait–monotrait ratio (HTMT). This indicator represents the average of the heterotrait–heteromethod correlations in relation to the average of the monotrait–heteromethod correlations (Henseler 2017). All the values of the correlations are below 1 (see Table 5).

Table 5. Discriminant validity of the model (HTMT).

Construct	COPE	DIGI	DIGB	INNM
COPE				
DIGI	0.296			
DIGB	0.271	0.549		
INNM	0.570	0.457	0.418	

4.2. Structural Model

To analyze the structural model, the algebraic sign (+, −), the magnitude, the value of t, and finally, the level of significance of the trajectory coefficients (beta value) were evaluated. These analyses were carried out through the bootstrapping resampling technique with 5000 samples. In addition, standard deviation and explained variance (R^2) are shown by multiplying the value of the path coefficient and the correlation. This analysis was performed under a one-tailed Student's t distribution with n − 1 degrees of freedom.

The results of the hypotheses built in the proposed model show that H1, H2, and H3 have positive and significant effects at 99%, 95%, and 99%, respectively. This shows that these hypotheses have empirical support (see Table 6). However, H2 presents a weak relationship and effect according to the values of the beta coefficient, the value of t, the value of f^2, and the confidence intervals.

Table 6. Model Hypothesis Test.

Hypothesis	Path Coefficient	SD	T-Value	*p*-Value	F^2	Percentil 5% (CI)	Percentil 95% (CI)	Bias Corrected 5% (CI)	Bias Corrected 95% (CI)	Result
H1: DIGI → INNM	0.330 ***	0.016	20.961	0.000	0.102	0.304	0.356	0.304	0.356	Confirmed
H2: DIGI → COPE	0.035 **	0.017	2.001	0.023	0.001	0.006	0.064	0.006	0.064	Confirmed
H3: INNM → COPE	0.476 ***	0.020	23.853	0.000	0.209	0.444	0.510	0.444	0.510	Confirmed

*** $p < 0.001$; ** $p < 0.01$.

4.2.1. Indicators of Predictive Analysis of the Model

To verify the predictive quality of the theoretical model, the adjusted r^2 value of the endogenous constructs was analyzed; the results report the following: INNM = 0.229 and COPE = 0.278. The INNM has the role of an independent and dependent variable. The COPE variable is a dependent variable of the model and together with the INNM, has a substantial predictive effect (Chin 1998). The effect size of the exogenous to the endogenous variables of the model was also analyzed through the f^2 test. The data reveal that the key relationships of the model are DIGI → INNM = 0.102 (mean effect); DIGI → COPE = 0.001 (small effect) and INNM → COPE = 0.209 (mean effect).

4.2.2. Measuring the Predictive Relevance of the Model

To evaluate the model's predictive relevance, the Stone–Geisser test was carried out using the blindfolding technique to determine the value of Q^2. Values of the reflective variables greater than zero are considered to have adequate predictive relevance (Chin 1998). Our model results show the following values: INNM = 0.226, EI = 0.090, and COPE = 0.135. In addition, another measure of goodness of fit was incorporated to measure the global model; for this, the standardized root mean square residual (SRMR) was considered: a value that must be below 1 (Williams et al. 2009; Henseler et al. 2016). Our value is 0.082, which shows that the proposed model has a good fit.

4.3. Moderation Analysis

In this section, the moderation analysis was carried out, which consists of describing a situation in which the relationship between two constructs is not constant but depends on the values of a third variable, called the moderating variable. The moderating variable (or construct) changes the strength or even the direction of a relationship between two constructs in the model (Cepeda-Carrión et al. 2022). Moderating relationships are usually hypothesized a priori by the researcher and are specifically tested (Becker and Cheah 2022). The testing of the moderating relationship is done by assessing the effect of the interaction term (i.e., the product of the moderator and predictor variable), which indicates whether changes in the moderator increase or decrease the strength of the focal relationship (Becker et al. 2018). A simple slope plot (see below) further helps to assess the moderation effect. For the analysis of the moderation effects, the PROCESS method or model was used. In SmartPLS, it is possible to make use of this method. Path analysis is a regression-based technique for estimating models with multiple dependent and independent variables. Unlike PLS-SEM, it is a one-step approach that uses equally weighted indicators in the case of multiple measurements per construct and operates on nonstandardized data. Bootstrapping in SmartPLS allows for testing the importance of the route model. Thus, the PROCESS module provides all the modeling and calculation options that are classically offered for PROCESS (Hayes 2018). SmartPLS automatically generates the PROCESS models, and the results are output directly, so no further calculations are required outside of SmartPLS (Sarstedt et al. 2020).

The moderation analysis shown in Table 7 reveals that the barriers to digitalization have a moderating effect on actions for digital transformation, innovation management, and the corporate performance of SMEs. The most significant changes occurred in the increase in H1, revealing that the barriers to digitization have made companies more resilient and reconfigured their strategies towards digitization and innovation management with the use of new technologies. In addition, it has been observed that H2 suffered a negative and significant effect, revealing that greater digital barriers decrease the corporate performance of Mexican SMEs. On the other hand, H3 has shown a noticeable decrease as digital barriers rise. H4 confirms that digital barriers significantly negatively affect the relationship between DIGI and INNM. H5 presents small significant and positive effects between the relationship of the DIGI and the COPE. H6 does not present empirical support (see Figure 2).

Table 7. Model Hypothesis (test moderation analysis).

Hypothesis	Path Coefficient	SD	T-Value	*p*-Value	Result
H1: DIGI → INNM	0.576 ***	0.056	10.264	0.000	Confirmed
H2: DIGI→COPE	−0.169 ***	0.031	5.418	0.000	Confirmed
H3: INNM→COPE	0.281 ***	0.026	10.808	0.000	Confirmed
H4: DIGB ∗ DIGI → INNM	−0.074 ***	0.015	4.946	0.000	Confirmed
H5: DIGB ∗ DIGI → COPE	0.055 ***	0.008	6.967	0.000	Confirmed
H6: DIGB ∗ INNM→COPE	−0.006 n.s	0.009	0.689	0.491	Reject

*** $p < 0.001$; n.s.: not significant.

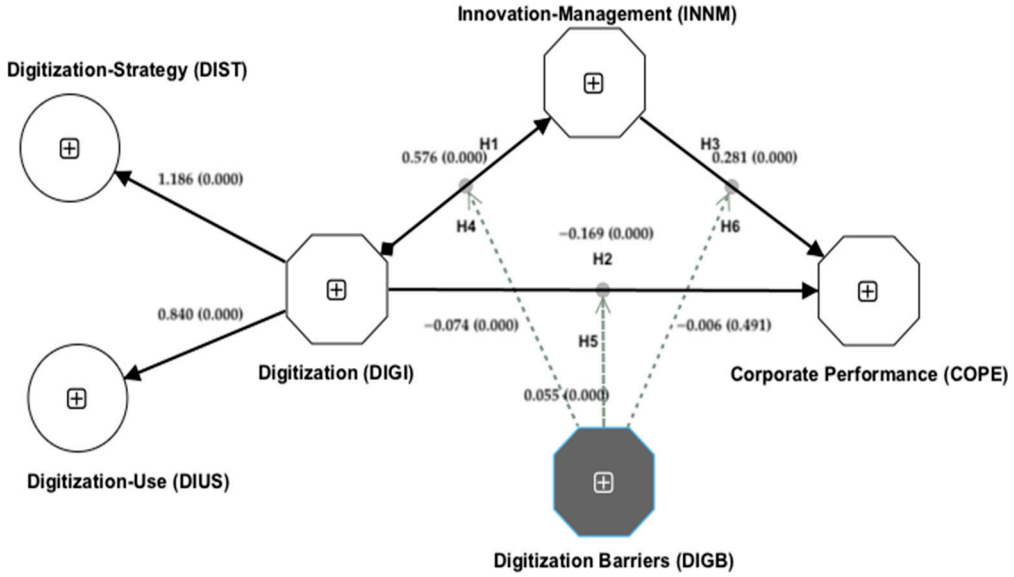

Figure 2. Nomogram of this study (test moderation analysis).

4.4. Mediation Analysis

To verify the direct and indirect effect (simple mediation) of INNM (M) between DIGI (X) and COPE (Y), we performed a mediation test. This test initially estimates the value of the direct effect (c'). To do this, the following procedure must be followed: (1) initially estimate the value of the direct effect (c'); (2) determine the indirect effects (a1 × b1) through the bootstrapping technique with 5000 subsamples with 90% confidence intervals (Nitzl et al. 2016); and (3) determine the magnitude of the indirect effect, the value of the variance accounted for (VAF), and the relevance of the effect to determine the type of mediation (Carrión et al. 2017; Hair et al. 2017). The hypotheses to verify the effects of mediation are H1: DIGI has a direct positive effect on the COPE of Mexican SMEs: H1 = DIGI → COPE = (c') and H2: The relationship between DIGI and COPE is positively mediated by the INNM of Mexican SMEs. H2 = DIGI→INNM → COPE. The results of this mediation analysis indicate that the DIGI has a small direct positive and significant effect on performance (H1: c', which is in agreement with the value of 0.064 ***. In addition, H2 shows that the INNM variable has a mediation effect between the DIGI and COPE variables (H2: a1 × b1). This analysis explains that the total indirect effect is 0.210 ***, and the total effect is 0.274 ***. The value of the magnitude of the indirect effect according to the variance accounted for (VAF) is 77%. Taking as reference what was stated by the researchers Nitzl et al. (2016), it can be ensured and stated that in our analysis, there is a complementary partial mediation (see Table 8 and Figure 3).

Table 8. Model Hypothesis (test mediation analysis).

	Coefficients	**Bootstrap 90% (Confidence Intervals)**			
		Percentiles		**Bias Corrected**	
Direct Effect					
H_1: c′	0.064 ^{sig}	0.039	0.088	0.039	−0.039
a_1	0.431 ^{sig}	0.411	0.452	0.411	0.411
b_1	0.487 ^{sig}	0.460	0.514	0.460	0.460
Indirect Effect	Estimated point	Percentile		Bias Corrected	VAF
H_2: $a_1 \times b_1$ Total effect	0.210 ^{sig} 0.274 ^{sig}	0.189	0.232	0.189	0.189	77.00%

^{sig} = *p*-value of 99% significance.

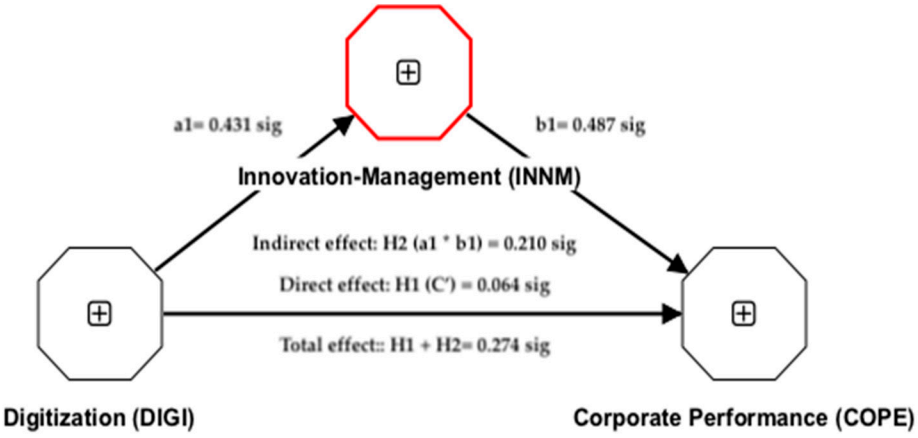

Figure 3. Nomogram of this study (test mediation analysis).

5. Discussion

This section discusses the findings derived from testing the hypotheses of the research model under study. From the perspective of dynamic capabilities, empirical evidence is revealed to fulfill the research objectives.

In the first scenario, the results reveal that digitization has positive and significant effects on innovation management and corporate performance. The TDC, in short, has exposed that companies at all levels need to reconfigure their business strategies through the mix of resources (technical, technological, and financial) and capabilities (leadership, knowledge, and a management approach towards open innovation) to develop and reach a level of digital maturity (Bogers et al. 2019; Teece 2016). The exposed findings derived from the verification of H1 are aligned with the TDC and with recent empirical studies. There is no doubt that digitization is a factor that increases innovation practices in organizations, including SMEs. In our study, we have revealed that digitalization has a moderate, significant, and positive effect on the management of innovation that is manifested in Mexican SMEs. All this allows us to infer that to achieve better innovation results, it is necessary to execute a mixture of business strategies that favor the performance and competitiveness of SMEs. During the COVID-19 pandemic, many SMEs disappeared from the competitive arena, and others managed to survive with many limitations (Dörr et al. 2021; Hosan et al. 2022). This has been revealed in the study of Elhusseiny and Crispim (2022), expressing that the main barriers faced by SMEs for digitization are technical, organizational, technological, and legal. Recent literature indicates that some studies coincide with our findings. Hosan et al. (2022) stated that technological capabilities help business digitization and that they are also engines that drive innovation for digital transformation. Combining intangible resources with technological capabilities can propel SMEs to a higher level of innovation (Teece 2018; Valdez-Juárez and Castillo-Vergara 2021). The vast majority of SMEs in Latin America during the COVID-19 pandemic were resilient and allocated their financial resources to invest in technological innovation (Vargas et al. 2022; Khurana et al. 2022). These innovative companies managed to promote the use of digital platforms to meet the needs of their customers, increase market shares, and stay in the competitive fight (Caballero-Morales 2021; Lee et al. 2022).

With respect to H2, the results express that digitalization has a small (weak), significant, and positive effect on the corporate performance results of Mexican SMEs. These findings are in line with the TDC and with the empirical studies considered in the investigation. However, the result of this relationship, despite being significant, is not strong and not very decisive to achieve an ideal corporate result and performance for Mexican SMEs. Therefore, the effect of the efficiency and performance of digitization on corporate performance depends on additional internal and external factors of the company (Leischnig et al. 2016; Wang and Kim 2017). The TDC and some classic studies developed by Jensen et al. (2007) and Teece (2010) have declared that information systems and the use of technology are the right paths for digitalization, technological innovation, competitiveness, and sustained corporate

performance. However, these studies have also confirmed that SMEs require greater resources and capabilities to reconfigure their business strategies. Our findings have coincided with more recent studies stating that the global economic situation caused by the COVID-19 pandemic has seriously affected the organizational and financial results of SMEs. For example, Sabai Khin and Ho (2019) and Hosan et al. (2022), affirm that digital innovation is a business strength that helps improve corporate performance but that in the current scenarios, many SMEs have forced the use of digital platforms to continue competing and satisfying consumer markets. This caused many SMEs and more in the Latin American region to focus their economic and financial resources on investing in the use of new technologies (OECD 2020; Crupi et al. 2020; Khurana et al. 2022). With this, it is inferred that the priority of the SMEs is survival, exposing and sacrificing the results of financial profitability.

A third scenario reveals that technological and nontechnological barriers are significantly involved in digitization as part of one of the most effective business strategies for achieving higher levels of innovation results and corporate performance. The results of the analysis of the moderating variable "digital barriers" show similar conclusions with the TDC and classic experts on the subject. The original hypotheses of the models H1, H2, and H3 have undergone significant changes when adding the moderating variable "digital barriers". Therefore, to verify the moderating effect in the original model, the results of H4 explain that when digital barriers are increased, actions and/or strategies for digitization have a small negative and significant moderating effect on the management of digitalization and innovation. H5 reveals that when there are greater digital barriers, a small positive and significant moderating effect is generated in corporate performance. In addition, H6 has confirmed that there is no significant moderating effect in the management of innovation and corporate of Mexican SMEs. In short, the TDC states that organizations require technological capabilities and resources to scale toward a digital transformation. However, many companies, including SMEs, still do not see the benefits and potential that can be achieved (Parrilli and Alcalde Heras 2016; Teece 2018). Therefore, Andreeva and Ritala (2016) and Teece (2007) have expressed that dynamic capabilities encompass the development, deployment, and protection of combinations of resources and skills that are required to adapt to changes in the business environment. In summary, the barriers faced by SMEs for digitization (human, technical, technological, and legal) (Elhusseiny and Crispim 2022; Ullah et al. 2021; Indrawati et al. 2020) are moderately affected by resilience capabilities, innovation practices, and visionary leadership (Hosan et al. 2022; Indrawati et al. 2020). This has allowed traditional business models to migrate to new business models based on the reconfiguration of dynamic capabilities (technology and innovation) (Volberda et al. 2021). The results of the mediation effect are conclusive and show that the INNM increases the results between the DIGI and the COPE. This shows that the reconfiguration of the strategies of SMEs towards dynamic innovation capabilities plays a key role in digital transformation, the incorporation of new technologies, and the financial and organizational results (Bouwman et al. 2019; Gassmann et al. 2010; Teece 2010).

6. Conclusions

This section summarizes the findings of this study through a series of theoretical and practical conclusions and implications.

This research firstly contributes to the development and growth of Latin American SMEs (including Mexico), which mostly have a stagnant (emerging) economy, little technological development, and are generally poorly studied. SMEs represent 90% of the global business fabric; this means that they contribute between 60 and 70% of employment and half of all gross domestic product (GDP) globally (World Bank 2021b). Our second contributing argument of this study focuses on sustaining from a TDC perspective that SMEs are more vulnerable to changes in the environment compared to organizations that are large, in developed economies, and in high technology sectors; however, with the reconfiguring strategies focused on technology and innovation, SMEs can minimize the impacts of the environment.

Despite the current environment suffocated by the global economic crisis caused mainly by the COVID-19 disease and, on the other hand, by the war between Russia and Ukraine, most companies are at a crossroads. According to the results obtained in our study, it follows that Mexican SMEs are exploring the use of new technologies and innovation management to survive and, in a certain way, improve their corporate performance results. The most outstanding strategies that the directors of Mexican SMEs are incorporating in their process for digitalization are the technological training of all collaborators and the use of technology in their processes for organizational management. In addition, these managers are incorporating and using new technologies, such as ERPs (enterprise resource planning) and big data with the support of free software. At the same time, SME managers are paying more attention to innovation management practices in three fundamental aspects: (1) changes and/or improvements in the organization, (2) new changes and/or improvements in purchasing and in the supplies for its production processes or services, and (3) new changes and/or improvements in marketing and sales. These actions prevail in most companies globally; the use of technology platforms has significantly helped them to have greater contact with customers, employees, and suppliers.

The results of this study have concluded that Mexican SMEs are on the right track and in a constant competitive struggle. We have observed that digitization has had positive and significant effects on innovation management. In addition, it has been shown that innovation management has a positive and significant influence on corporate performance. However, digital barriers are impeding the development and technological growth of Mexican SMEs. Undoubtedly, the different manifestations of the barriers to digitization are present in these companies. The investigators Matt et al. (2016) and Chanias and Hess (2016) confirm that the priority of companies should be to focus their resources and capabilities on the development of strategies for digital transformation. These actions drive the company to a higher level, ceasing the company to be one with a traditional model to a completely innovative business model (Andreeva and Ritala 2016; Indrawati et al. 2020; Teece 2010). Recent evidence highlights that innovation activities and practices in their various manifestations (incremental, radical, technological, and open) are an engine that improves results between digitization strategies and corporate performance results (Latifi et al. 2021; Khattak 2022). In short, when there are greater investment and generation of innovation in processes, products and/or services and the organizational and financial results of SMEs increase. Nowadays, the use of technological innovations through the development and use of digital applications (apps) have helped companies to improve their industrial and commercial processes (De Reuver et al. 2018; Lee et al. 2022).

The discussion of our findings has allowed us to visualize and expose the following practical implications for the technological development and growth of Mexican SMEs: (1) it is important that there are clear and effective public policies on digital transformation (Ulas 2019). Despite the existence of international organizations that promote these initiatives, the results are not very significant. In particular, Mexico is among the five countries in the Latin American region with a higher level of digitalization and business innovation (CEPAL 2020). The truth is that many of the companies with these capabilities utilize foreign capital and are medium to large. Therefore, SMEs are still unprotected and with a significant digital and technological gap; (2) within SMEs, a corporate philosophy based on collaborative work and digital transformation is required (Khurana et al. 2022). The lack of financial capacity and lack of strategic plans have led Mexican SMEs to a status quo; (3) SME managers should place great emphasis on permanently and continuously interacting with their different interest groups (customers, suppliers, employees, other companies in the sector, universities, government, and research centers). With this, they would not only be able to develop incremental innovation but also radical changes through open innovation (Carayannis et al. 2012; Carayannis et al. 2018). The benefits would be exponential when migrating from a traditional business model to a new business model with local and global reach. Examples of this are Uber, Spotify, Airbnb, Amazon, Netflix, and businesses that put open innovation into practice with the support of new technologies; (4) the current challenges and those that will continue to be faced in

the future by SME managers are incalculable, so it is important that they develop emotional (resilience) and cognitive (creativity) capacities that allow them to remain in the changes of the environment (economic, technological, political, and cultural). The development of technology is constant and dynamic. Today, SMEs have the challenge of industry 4.0 and open innovation but also with the imminent arrival of industry 5.0 not only in society but also in business. Industry 4.0 implies rapid and disruptive changes in digital manufacturing, network communication, computer technologies, and automation, among other more important activities (Zhou et al. 2015). The industry 4.0 concept is a new approach that mixes digital and physical aspects. The main aspects addressed by industry 4.0 are the smart factory, the design of intelligent products, innovative business models, and real-time relationships with customers (Rojko 2017). Industry 5.0 foresees the use of industry 4.0 by combining automated machines, such as collaborative robots, with the intelligence and skills of humans (Nahavandi 2019). This is all along with improving the customer experience and making industrial processes more innovative and more friendly to the environment (Maddikunta et al. 2022); and (5) some practical implications generated by the findings of the INNM mediation effect on the relationship between DIGI and COPE are the following: For the directors or owners of SMEs, innovation management should be an obligatory practice and a key element that impacts the DNA of your organizational culture. In addition, it is recommended that SMEs solidify their technological capabilities through leadership and digital culture. It is important that SMEs gradually incorporate open innovation and sustainable practices into their internal processes (Khin and Ho 2019). Therefore, in order to obtain better financial results, it is recommended that SMEs link technological innovation with organizational innovation (Zhang 2022). From a methodological context, this study presents an interesting contribution to the development of the simple mediation analysis of the INNM on the relationship between the DIGI and the COPE using PLS-SEM. The vast majority of studies have addressed it very sparingly and preferably in the sector of large high-tech companies (Ferreira and Coelho 2020).

Finally, since many investigations have limitations, in this section we describe some of the main limitations that have emerged during this investigation. The first limitation is the sample explored in this study since it involves SMEs from different regions of Mexico with different characteristics ranging from economic to cultural given that Mexico is a country with a very wide territorial extension. In addition, it is important to explain that in Mexico, there are no organizations that collect public information from SMEs on the current state of technology and innovation practices. The second limitation refers to the answers obtained in this study since they are subjective opinions of the directors of SMEs. In Mexico, it is very difficult to obtain hard data on the current status of companies in terms of technology, the digitalization level, innovation actions, and economic indicators; for this reason, the FAEDPYME network of researchers was used to collect data in the regions with presence of the red. Regarding the third and last limitation, we believe that in the future, the SEM technique based on covariance will be able to be used and also make contrasts with multigroup analyzes with regions of other countries. On the other hand, to continue analyzing the behavior of SMEs and give continuity to the proposed model, the most relevant future lines of research for the reality of these companies are the incorporation of open innovation and industry 4.0 in addition to verifying the effects of the futures of human, technical, technological, and legal barriers, which indicate the digital transformation of Mexican SMEs. All this is in a postpandemic framework, global economic crisis, and war (political) conflicts.

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Institutional Review Board Statement: This study was conducted according to the guidelines of the Declaration of Helsinki and approved by the Institutional Review Board (or Ethics Committee) of Instituto Tecnológico de Sonora (PROFAPI 2022_003).

Informed Consent Statement: Informed consent was obtained from all subjects involved in this study.

Data Availability Statement: The data and the questionnaire used in this study are available to other authors who require access to this material.

Conflicts of Interest: The author declares no potential conflicts of interest with respect to the research, authorship, and publication of this article.

Appendix A

Construct/Indicator	Ítems	Factor Loading	VIF
Digitization (DIGI)			
Digitization-Use (DIUS)			
DIUS1	Own website	0.690 ***	1.563
DIUS2	We make sales in our own e-commerce portal	0.721 ***	1.964
DIUS3	Telecommuting	0.800 ***	2.201
DIUS4	ERPs (Enterprise Resource Planning)	0.865 ***	3.116
DIUS5	Corporate intranet	0.856 ***	2.909
DIUS6	Services to cover cybersecurity	0.842 ***	2.729
DIUS7	Big data and data analysis software	0.860 ***	3.027
Digitization-Strategy (DIST)			
DIST1	We allocate significant resources to digitizing the business	0.845 ***	2.866
DIST2	The business model is evaluated and updated in terms of digitization	0.864 ***	3.145
DIST3	Our employees are prepared for the digital development of the company	0.851 ***	2.819
DIST4	Our managers have good training in digitization	0.845 ***	2.766
DIST5	The degree of process automation is high in my company	0.860 ***	2.957
DIST6	We use digitization in the organizational management of the company	0.888 ***	3.186
DIST7	Training for digital transformation is regularly organized in our company	0.876 ***	3.507
Digitization Barriers (DIGB)			
DIGB1	Insufficient broadband connection	0.720 ***	1.674
DIGB2	Lack of financial resources in the company	0.800 ***	2.502
DIGB3	High investment costs	0.798 ***	2.427
DIGB4	Digitization can be poorly received by workers	0.747 ***	1.881
DIGB5	Lack of well-qualified staff that is hard to find and keep	0.819 ***	2.479
DIGB6	Lack of knowledge about technology providers	0.824 ***	2.671
DIGB7	Demanding information technology security requirements (cybersecurity)	0.799 ***	2.316
DIGB8	Lack of corporate culture to drive digital transformation	0.794 ***	2.352
Innovation Management (INNM)			
Product Innovation			
INNM1	We have made changes or improvements to our products/services	0.817 ***	2.358
NNM2	We have launched new products/services on the market	0.811 ***	2.428
Process Innovation			
INNM3	We have made changes or improvements in the production processes	0.852 ***	2.781
INNM4	We have purchased new supplies and equipment	0.815 ***	2.346
Organizational innovation			
INNM5	We have made new changes or improvements in the organization	0.864 ***	3.068
INNM6	We have made new changes or improvements in purchases and/or supplies	0.860 ***	2.989
INNM7	We have made new changes or improvements in the commercial and/or sales process	0.859 ***	2.889
Corporate Performance (COPE)			
COPE1	Customer satisfaction	0.778 ***	1.972
COPE2	Speed of adaptation to changes in the market	0.794 ***	1.805
COPE3	Speed of sales growth	0.798 ***	1.980
COPE4	Increased profitability	0.767 ***	1.949
COPE5	Efficiency of production processes	0.779 ***	2.060
COPE6	Quality of their products	0.778 ***	1.866

*** $p < 0.001$.

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