DIGITAL TRANSFORMATION AS THE BASIS OF STRATEGIC SME POSITIONING IN MEXICO: A LITERATURE REVIEW

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ABSTRACT

Digital Transformation is essential for SMEs in Mexico. It affects business models, value propositions, and supply chains. More than technology, it implies a change in business mentality and is a need and challenge prevailing in various sectors. The objective of this research is to explain how digital transformation and maturity impact the strategic positioning of SMEs in Mexico. Topics such as process digitization, digital capabilities, and the current situation of SMEs in Mexico in these fields are also explored. A literature review was carried out to analyze various documents, focusing on the presence of keywords of the descriptors: Industry 4.0 and SMEs, process digitalization, digital transformation, digital maturity, digital transformation phases, digital capabilities, technological markers, and virtualization. Among the most significant results we have, is that process digitalization is crucial in Industry 4.0, but companies face challenges adopting them because of technological maturity. Using digital technologies, digital transformation optimizes

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communication, collaboration, and decision-making in organizations. Digital capabilities, encompassing skills and processes, enable an entity to add value to its strategy through efficient digital tool use. Digital maturity becomes crucial for the effective implementation of digital technologies and the improvement of strategic positioning. In this context, progress in process digitization, the strengthening of digital maturity, and the development of digital capabilities are imperative for SMEs in Mexico. This process has a direct impact on productivity, efficiency, and strategic positioning, and these aspects are increasingly determined by the digital age. The possibility of future studies that evaluate maturity and specific digital capabilities is suggested, to promote technological development in the small and medium-sized enterprise sector.

Keywords: Process Digitalization, Digital Transformation, Digital Maturity, Digital Capabilities, Strategic Positioning, SMEs Mexico.

LA TRANSFORMACIÓN DIGITAL COMO BASE DEL POSICIONAMIENTO ESTRATÉGICO DE LAS PYMES EN MÉXICO: UNA REVISIÓN DE LA LITERATURA

RESUMEN

La transformación digital es esencial para las pymes en México. Afecta los modelos de negocio, las propuestas de valor y las cadenas de suministro. Más allá de la tecnología, implica un cambio en la mentalidad empresarial y representa una necesidad y un desafío presente en diversos sectores. El objetivo de esta investigación es explicar cómo la transformación digital y la madurez digital impactan el posicionamiento estratégico de las pymes en México. También se exploran temas como la digitalización de procesos, las capacidades digitales y la situación actual de las pymes en el país en estos ámbitos. Se realizó una revisión de la literatura para analizar diversos documentos, enfocándose en la presencia de palabras clave de los descriptores: Industria 4.0 y pymes, digitalización de procesos, transformación digital, madurez digital, fases de la transformación digital, capacidades digitales, indicadores tecnológicos y virtualización. Entre los resultados más relevantes se encuentra que la digitalización de procesos es crucial en la Industria 4.0, pero las empresas enfrentan desafíos para adoptarla debido a su madurez tecnológica. A través del uso de tecnologías digitales, la transformación digital optimiza la comunicación, la colaboración y la toma de decisiones en las organizaciones. Las capacidades digitales, que abarcan habilidades y procesos, permiten a una entidad agregar valor a su estrategia mediante el uso eficiente de herramientas digitales. La madurez digital se vuelve crucial para la implementación efectiva de tecnologías digitales y la mejora del posicionamiento estratégico. En este contexto, el avance en

la digitalización de procesos, el fortalecimiento de la madurez digital y el desarrollo de capacidades digitales son imperativos para las pymes en México. Este proceso tiene un impacto directo en la productividad, la eficiencia y el posicionamiento estratégico, y estos aspectos están cada vez más determinados por la era digital. Se sugiere la posibilidad de futuros estudios que evalúen la madurez y las capacidades digitales específicas, con el fin de promover el desarrollo tecnológico en el sector de las pequeñas y medianas empresas.

Palabras clave: Digitalización de procesos, transformación digital, madurez digital, capacidades digitales, posicionamiento estratégico, PYMES México.

INTRODUCTION

In a constantly evolving business environment, process digitalization, digital transformation, digital maturity, and digital capabilities have become fundamental concepts that impact organizations' competitiveness and success. Small and medium-sized enterprises (SMEs) play a crucial role in the global economy. They are the vast majority of companies worldwide and contribute significantly to employment and the Gross Domestic Product (GDP). In Mexico. Its impact is notable, generating 72% of jobs and contributing to 52% of GDP. At an international level, SMEs account for 60% to 70% of employment, and 50% of GDP, underlining their importance as local and global economic drivers. [1] . Despite their importance, these companies face considerable challenges in terms of productivity and the adoption of information and communication technologies (ICTs).

Process digitalization has become a prevailing necessity in an increasingly interconnected world. Industry 4.0, driven by technologies such as the Internet of Things (IoT), has brought about fundamental changes in the way companies operate and engage with their customers and markets. However, adopting thtechnologies, undoubtedly, has its challenges, and an organization's digital maturity plays a crucial role in its ability to implement these innovations effectively.

In this digital transformation age, small and medium-sized enterprises (SMEs) must adopt several key components to ensure the success of their digital initiatives. These components include leadership and a digital mindset, where leaders must foster a culture open to change and innovation, implement a comprehensive strategy that aligns technology with business objectives, and train and develop talent to improve a company staff's digital skills. Moreover, it is fundamental to have a robust technological infrastructure that effectively supports digital operations and promotes an organizational culture that values experimentation and adaptability. To measure the success of these efforts, SMEs should focus on KPIs such as operational efficiency, which evaluates cost reduction and process improvement, employee engagement or loyalty, which reflects the impact on staff satisfaction and productivity, and customer experience, which measures satisfaction and loyalty thanks to service upgrades. The impact of digital transformation on SMEs translates into expanded access to new markets, including global opportunities, a significant improvement in competitiveness through the offer of innovative products and services, and greater business resilience that allows them to adapt quickly to market changes and challenges. [2]

Industry 4.0 is transforming project management through advanced technologies. The introduction and expansion of elements such as the Internet of Things (IoT), cyber-physical systems, and digitalization have created an environment where system

integration and interconnection are crucial for operational efficiency. Challenges associated with these changes include a need for significant new technology investment, training human beings to handle these technologies, and a need for new project management strategies to integrate technological and human elements. [3]

The government plays a fundamental role as an enabler, Latin America is addressing digital transformation in the public sector. It is noticeable that, although there is considerable economic and governance diversity in the region, several countries are making significant efforts to integrate information and communication technologies into their governance systems. This is done not only to improve the delivery of public services through digital platforms but also to foster citizen participation and government transparency. An interesting point is the analysis of digital government initiatives in countries such as Mexico, where constitutional reforms have aimed to make the country's jurisdictional apparatus more efficient and promote citizen participation through alternative justice mechanisms. This shows a movement towards a more inclusive participatory government, taking advantage of possible technology offers. Challenges are important, such as a need to improve interoperability between various government agencies and levels, and the importance of ensuring equitable access to these technologies for all the population. Although Latin America is progressing in its public digitalization agenda, there is still a considerable way to go to achieve a full effective implementation that benefits all sectors of society. [4]

When we approach digital transformation in companies, we face a series of challenges that go beyond simply adopting new technologies. We must understand that digital transformation is a comprehensive change that affects not only technological infrastructure but also organizational culture and business strategies. The digital strategy should not be an afterthought or limited to certain departments. It should be a comprehensive view that cuts across all areas of the business, such as marketing, operations management, and customer services. This strategy should clearly define how technology can improve existing processes, create new business models, and provide additional value to customers. Furthermore, it must be flexible and adapt to swift technology and market changes. Companies need to see digital transformation not just as an investment in technology, but as a fundamental overhaul of how they operate. This involves reviewing business processes and finding ways to integrate digital solutions that improve efficiency and effectiveness. Digital transformation also requires a focus on improving customer experience through more intuitive interfaces and more efficient customer service processes, leveraging technologies such as artificial intelligence and big data to personalize interactions and anticipate customer needs. Digital transformation is a complex journey that requires a commitment to a changing culture, the implementation of a robust digital strategy, and a deep understanding of how

technology can fundamentally transform business operations. To succeed, companies need visionary leaders and a holistic approach that considers all of an organization's aspects. [5]

Digital transformation involves the use of digital technologies to improve innovation, the distribution of goods and services, the dissemination of knowledge, and customer-supplier interaction. In this context, the 2025 digital agenda in Spain serves as an example of a strategic approach to drive nationwide digital transformation. [6]

Digital maturity refers to an organization's ability to implement digital technologies effectively and efficiently to achieve its strategic goals. Various models and approaches, including assessment frameworks and methodologies, have been proposed to measure this maturity, highlighting its critical importance in current business contexts. These models help companies identify their strengths and areas for improvement, thus facilitating a more robust digital transformation aligned with their global goals. [7]

An organization's digital capabilities are closely related to its ability to operate digital technology and develop new products or services. These capabilities can generate significant value for business improving internal communication, decision-making, and customer satisfaction. [8]

Adopting digitalization, digital transformation, improving digital maturity, and developing digital skills are essential for SME competitiveness and growth. Improving these aspects can lead to increased productivity, better financial results, and increased customer satisfaction.

The hypothesis put forward in this study postulates that there is a positive relationship between greater digital maturity and digital capabilities in small and medium-sized enterprises (SMEs) in Mexico, and improved business performance, higher productivity, and increased customer satisfaction.

1. THEORETICAL FRAMEWORK

Industry 4.0 in Mexico represents a significant phase in the technological and operational evolution of companies, especially in manufacturing, due to the integration of advanced technologies such as the Internet of Things (IoT), cloud computing, big data, and advanced robotics. These technologies are redefining the way companies operate, manage their processes, and engage with customers and suppliers.

Industry 4.0 promises to transform the business landscape in Mexico through mass customization, advanced data integration, and a reinforced focus on sustainability. This technological revolution allows Mexican companies to produce customized

goods and services on a large scale, meeting specific consumer needs and competing effectively in global and local markets. Simultaneously, the intensive use of data analytics and artificial intelligence is optimizing business decisions and operations, ensuring they are more informed and timely. In addition, Industry 4.0 fosters greater sustainability by improving resource efficiency and optimizing processes, which is crucial under increasing regulatory pressures and demands for corporate responsibility. These advances not only increase competitiveness but also promote more responsible sustainable business practices. [9]

In Mexico, there have been public plans and programs to promote Industry 4.0 in Mexico, especially in states such as Guanajuato and Nuevo León. They are focused on promoting the adoption of advanced technologies and strengthening the innovation ecosystem at state and federal levels. These policies seek to transform the Mexican industrial landscape by integrating technologies such as the Internet of Things (IoT), artificial intelligence, and robotics into production processes. The impact of these programs is most notably seen in sectors such as advanced manufacturing, automotive, and aerospace, where the integration of Industry 4.0 solutions has enabled Mexican companies to significantly improve their supply chain, production processes, and innovation capacity. However, the deployment and effectiveness of these programs vary significantly in different regions and sectors, reflecting diversity in industrial and technological capacity in the country. [10]

On the other hand, strategic positioning is seen as a company's ability to align its operations and production capacities with the competitive priorities essential to achieve market success. This approach helps a company target its resources and strategies strengthening its competitive advantage, improving its business performance, and impacting the implementation of technology. Also, process digitalization plays a crucial role in improving the strategic positioning of SMEs in Mexico, upgrading operational efficiency reducing costs and production times. Advanced technologies allow more precise control over production processes, resulting in higher quality and more reliable products. In addition, technological solutions are increasing the flexibility of companies, allowing them to quickly adapt their production to changes in market demand and offer greater product customization without sacrificing efficiency. [11]

To develop an effective digital transformation strategy, companies need to focus on key ideas that facilitate a comprehensive change from basic technology integration to complete business model transformation. First, digitalization involves incorporating digital technologies into existing tasks to improve efficiency and productivity. This evolves towards strategic digitalization, where technologies are used to modify business processes and create more value. Digital transformation seeks a total reinvention of

business activities, processes, products, and models to make the most of digital technologies, profoundly affecting the way value is created and captured, which can result in new business models. In addition, dynamic capability development is crucial, enabling companies to integrate, build, and reconfigure internal and external competencies to respond to changing environments. These capabilities are essential to sustain digital transformation effectively and continuously. Finally, digital transformation also requires a profound cultural change, where digital leadership must promote an environment that values agility, innovation, and a willingness to experiment and adopt new technologies. These elements are critical for businesses to structure their digital transformation strategies, adapting them to their specific needs and the context in which they operate, thus ensuring that they can successfully navigate an ever-evolving digital landscape. [12]

For Brunetti, Matt, Bonafanti, De Longhi, Pedrini, and Orzes [13] the three fundamental pillars to face the challenges of digital transformation from a multi-stakeholder approach are culture and skills, infrastructures and technologies, and ecosystems. For effective transformation, it is essential to develop a robust digital culture that encourages digital education from an early age and promotes continuous training in workplaces. In addition, companies must invest in advanced technological infrastructures, such as high-speed networks and enhanced security to support emerging technologies such as artificial intelligence and big data. It is also fundamental to build digital ecosystems that facilitate public, private, and academic sector collaboration to enhance innovation and sustainable development. Decision-makers face the challenge of implementing these strategies coherently and coordinatedly, requiring a leadership that aligns all of an organization's aspects with a digital vision, which demands an ongoing commitment to adaptation and learning.

Digital transformation allows SMEs to improve their operational efficiency, innovate their business models, and offer products and services more aligned with current consumer needs. These transformations are not merely technical but require a comprehensive change in corporate culture, emphasizing agility, continuous innovation, and a customer-centric approach. [14]

In Mexico, Rivera Pesquera (2021) highlights that there is a variety of interpretations and approaches to digital transformation, stressing that, although each company has its own particular vision, they all agree that it is a means to improve customer experience, not an end in itself.

This transformation is not simply a matter of adopting new technologies, but rather a fundamental change in business model and organizational strategy, geared towards improving business performance and better meeting customer needs. Companies must

view digital transformation not just as a technology adoption but as a complete strategic overhaul that places customers at the heart of their operations. [15]

Advanced technology convergence under the framework of Industry 4.0 in Mexico is marking an era of significant transformation in the manufacturing sector and beyond, directly impacting the way companies operate, manage their processes, and relate to customers.

Federal and state government efforts and policy-making, especially in states such as Guanajuato and Nuevo León, have been instrumental in encouraging this technological adoption. [16] These programs not only promote new technology integration but also seek to strengthen innovation ecosystems and improve local and international company market competitiveness.

The main obstacles to digital transformation include organizational inertia, where companies struggle with resistance to change from established structures and processes. A lack of unified cognition of transformation is also mentioned, implying that not everyone in the organization understands or is aligned with digital transformation goals. Moreover, weak leadership at the top can undermine transformation efforts, as strong and decisive leadership is crucial to bringing about meaningful change. In terms of positive impact, digital transformation allows companies to stay competitive in a modern business landscape by integrating advanced technologies that improve operational efficiency and foster innovation. Digital transformation is also essential to adapt to market changes and achieve sustained growth by enabling new forms of value creation through business model innovation. Decision-makers face the challenge of overcoming these obstacles by implementing effective leadership and ensuring that the digital transformation vision and strategy are clear and encompass the entire organization. This requires a firm commitment to continuing education and training in digital technologies and cultural adaptation to foster an environment that supports innovation and digital adaptation. [17]

Consulting companies are a key tool in company development and growth. Digital transformation has had a profound impact on consulting firms, modifying their operations and their business models. Digitalization has enabled the "platformization" of traditional consulting services, where processes that previously required intensive human interaction can now be automated or managed digitally. This includes everything from automated report generation to self-service platforms that allow clients to proceed without the need for direct consultant interaction. The introduction of crowdsourcing in consulting has been a significant change transforming a consultant's role into a crowd manager, coordinating and filtering innovative solutions from a variety of sources. In addition, digital transformation has altered consultant-client matching

process, facilitating platforms that automate and optimize this matching based on specific needs and client profiles. These changes have not only improved efficiency and reduced costs but also expanded consulting firms' market reach, allowing them to offer more personalized and accessible services. Despite the benefits, this change also poses challenges, such as the need to continuously adapt to new technologies and manage increased complexity in service delivery. The ability to navigate these changes is now a critical requirement for consulting firms that want to stay competitive in an increasingly digitized marketplace. [18]

Industry 4.0 does not simply represent adopting new technologies, but changing business models and organizational strategies profoundly, focused on improving business performance and meeting customer needs more effectively. In this context, Mexico continues to progress, showing digital transformation is a challenge and a significant opportunity for growth and innovation in the business environment.

2 METHODOLOGY

The document was prepared using heuristic (preparation, exploration, description, formulation, collection, and selection) and hermeneutical (interpretation and publication) processes as described by Calderón, Londoño, and Maldonado [19] In general terms, based on techniques for collecting, analyzing, and processing information, we analyzed the content of more than 40 documents on digital transformation and its impact on strategic positioning in organizations. The research document search was conducted in scientific article and scientific journal databases like Scopus, Web of Science, EBSCOhots, Dialnet, OECD Library, and Emerald Insight. The inclusion of keywords of the descriptors was established as Industry 4.0 and SMEs, process digitalization, digital transformation, digital maturity, phases of digital transformation, digital capabilities, and virtualization.

Access to documents was focused on three criteria to select documentary sources: accessibility to the material, relevance of documents in terms of research, and prestigious databases. During the activity linked to the study of documented sources, this search was categorized according to year of publication, authors, title, place of publication, and incorporation or not of a methodology. A document search was conducted from 2011 to 2024 to learn about the dissemination of research on process digitalization, transformation, and digital maturity and its impact on SMEs' strategic positioning. The criteria for selecting or excluding research was first based on the relevance of the research, the number of citations or views, journal quartiles, and the H-index of the research, selecting only journals from the first three quartiles and indexes greater than 8.

This article is organized as follows:

- Theoretical framework: it provides a conceptual theoretical basis necessary to understand and contextualize articles.
- Methodology: This section describes the approach and methods used to conduct the study, including the collection and selection of relevant scientific papers.
- Process Digitalization: It addresses process digitalization, its importance, and key implementation phases.
- Digital Transformation: It explores digital transformation and its influence on organizations' strategic positioning, using examples of initiatives in Mexico and Spain.
- Digital Maturity: Different definitions and models of digital maturity are analyzed, highlighting the importance of measuring and evaluating this aspect in organizations.
- Digital Skills: It examines the digital skills needed to manage effectively SMEs' digital technology and innovation.
- Impact on SMEs in Mexico: It presents an assessment of SMEs' current situation in Mexico related to process digitalization, digital transformation, digital maturity, and digital capabilities.
- Conclusions: This section summarizes the key findings of the study and discusses implications for SMEs in Mexico.

3 PROCESS DIGITALIZATION

Process digitalization is already a reality and in some cases a necessity for companies in different sectors since they are part of the value chain of some other industry and the need to make their processes digital or some of them becomes indispensable. Hence, it is important to note that the concept of Industry 4.0 is based on the development of systems, tools such as IoT, and other technologies that together cause a transcendental change, not only in a given company but also in how this company's consumers or market communicate to do business. Also, one of the biggest obstacles that companies face in the face of process digitalization is related to a level of maturity to adopt technologies and be able to make this digital adoption. Therefore, it is important to consider three different phases: an initial phase to understand the concept of Industry 4.0, a development phase to design and structure the model and to be able to establish an applicable tool, and, finally, an implementation, validation, and adoption phase. [20]

It is important to emphasize that "digitalization based on information and software flows generates greater dissemination of knowledge, with a new demand for human resources with hard and soft skills as part of a permanent process of innovation integrating various areas and disciplines that affects the entire company's development and goes beyond a simple organizational adjustment ". [21]

Industry 4.0 in Latin America presents both opportunities and challenges. Among the opportunities, the ability to overcome historical technological dependence and improve productivity and competitiveness through advanced technologies such as IoT, AI, and Big Data stands out. It also fosters open innovation through collaboration among companies, universities, and governments. Challenges include a lack of adequate infrastructure and connectivity, a shortage of skilled human resources, and inequalities in technological development. In addition, the absence of coherent public policies supporting a transition to Industry 4.0 may delay technological progress. Governments in the region must design policies that promote the adoption of new technologies, address these structural barriers, and foster equitable access to these technologies. [22]

Organizations must recognize the strategic challenge of differentiating between hard skills that need to be adopted or developed and, at the same time, soft skills that, despite digitalization, continue to play a critical role. [23]

The above was analyzed and it was observed that process digitalization was a reality in which many organizations from multiple sectors were forced to adopt technologies and systems that transformed their operations and business models. This is based on the need for these companies to adapt to customers' changing demands and the growing transformation that value chains and business models are experiencing. Digitalization not only impacts companies but also the way customers or the market communicate to do business.

As a result of the analysis of this topic, we can find that process digitalization is a transcendental element that requires organizations' adaptation and careful planning. By addressing the challenges and seizing the opportunities offered by digitalization, businesses can improve their competitiveness and prepare for the future in an increasingly interconnected digitized world.

In the case of digitalization, which refers to the process of converting information and analog processes to digital formats, allowing greater efficiency, accessibility, and automation. This process has been essential to modernizing textile micro, small, and medium-sized enterprises (MSMEs) in Mexico, especially during the Covid-19 pandemic. Digital transformation has involved adopting technologies such as the Internet of Things, artificial intelligence, and cloud computing, which

has allowed companies to improve their business models and adapt to new market demands. Textile business models in a digital context have evolved significantly, especially in MSMEs. An exemplary case is that of Nube Ciega, an organization that produces and markets Amuzgo textiles. This company has used digital platforms such as Instagram to promote its products, tell the story behind each piece, and establish a closer connection with its customers. This strategy has enabled the company's survival during the pandemic, expanded its reach, and improved its market positioning. Nube Ciega is a solidarity support network among Amuzga women that is dedicated to producing and marketing traditional textiles. Its main objective is to preserve and recover ancient techniques and iconographies and create personalized pieces that adapt to modern consumers' needs. The company uses traditional backstrap loom weaving, brocade, and embroidery techniques, and its products include huipiles, shawls, shirts, and other textile accessories. Furthermore, Nube Ciega strives to offer support to its artisans, providing them with access to basic services and promoting a decent life. Through digitalization, Nube Ciega has been able to maintain its operation in difficult times, such as the pandemic, using digital platforms to promote and sell its products. This model has allowed the company's survival and improved Amuzga culture and tradition visibility globally. Digitalization has allowed Nube Ciega to transform its processes and business models, adapting to new market demands and taking advantage of available technologies to reach a wider audience. [24]

Without a doubt, the COVID-19 pandemic accelerated digitization processes in companies in the face of a need to survive, a key challenge has been training employees to use digital technologies, which is essential to move to online business models. Lack of access to adequate financing has made it difficult to invest in the technological infrastructures needed to implement digital solutions. Moreover, these companies have had to show great organizational resilience, adjusting their internal structures and processes to operate effectively in a remote digital environment. The ability to adapt quickly to these new conditions has been essential for the continuity of company operations and the mitigation of the economic impacts of the pandemic. [25]

Process digitalization is an inevitable reality for companies in various sectors, driven by the need to stay competitive and adapt to changing market demands. Industry 4.0, underpinned by advanced technologies such as IoT, artificial intelligence, and Big Data, has transformed the internal operations of companies, and the way they communicate and do business with customers. However, adopting these technologies presents significant challenges, especially in terms of infrastructure, connectivity, and skilled human resources. Organizations must consider a strategic approach that encompasses phases of understanding, development, and implementation to ensure a successful transition to digitalization. [26] Also, training employees in both hard and soft skills is crucial to

maximizing this transformation's benefits. Adaptability and organizational resilience are key to navigating challenges and seizing opportunities offered by digitalization, positioning companies for a more interconnected efficient future.

4 DIGITAL TRANSFORMATION

Digital transformation can be conceptualized in various ways; however, it involves using digital technologies via the internet or platforms available in this environment. Mobile technology makes it possible to monitor production, commercial, or service processes in real time to offer in most cases an opportunity to obtain information. This information is intended for analyses and generates a significant impact on innovation processes, the distribution of goods and services, and the dissemination of knowledge or information. All this is carried out in an environment connected by various kinds of devices that can be part of complex systems. For many organizations, this represents a way to bond with their customers and suppliers, generating a virtuous experience in terms of positioning. [27]

A crucial factor for the strategic positioning of organizations in a sector is the criteria of opportunity for growth and development, the structure and rivalry of their competitors, demand conditions, and customer sophistication. In addition, the entire context of related and supporting industries must be considered. The role of the government as a facilitator in digital transformation is and must be fundamental in the DIGITAL AGENDA 2025 project in Spain. [28] This project consists of 10 strategic plans aimed at digitalization, ranging from digital connectivity and the promotion of 5G technology to the strengthening of digital skills in people, cybersecurity, the public sector's digitization transformation of procedures, services, and infrastructure, support for digital transformation and entrepreneurship in companies, sectoral digitalization projects, emphasis on poles of attraction for investment and talent in the audiovisual sector, data economy, artificial intelligence, and digital rights. [29]

In Latin America, digital transformation emerges as a key pillar for (small and medium-sized enterprises) SMEs' competitiveness in Colombia. This transformation involves the adoption of new technologies and a comprehensive change in the way businesses operate and manage. According to recent studies, SMEs in cities like Bogotá, Neiva, and Manizales are incorporating Information and Communication Technologies (ICT) to improve their processes, reduce costs and optimize customer service. Digital transformation offers SMEs the opportunity to streamline data delivery, organize information efficiently, and optimize the training of their employees. These capabilities are essential to improve customers' experience and respond quickly to their needs, crucial aspects in an increasingly competitive globalized market. [30]

In Mexico there is no federal initiative; however, there are some state initiatives, that make visible in some way or focus on industry 4.0 or digital transformation, among the most relevant is "the Nuevo León 4.0 initiative" [31] where work is being done particularly in the automotive industry, software, household appliances, metalwork in technologies related to Big Data, artificial intelligence models, Blockchain and Fintech, Machine Learning, Internet of Things and cybersecurity. "In San Luis Potosi, the agenda", where the strategic cluster model called "Industrial Cluster 4.0" is being used, will allow companies to meet and articulate to create integrating technological solutions. Also in Leon, Guanajuato, an event is held with themes focused on Industry 4.0 for companies in this region.

Digital transformation is about integrating new technological tools or doing digital marketing and a cultural strategic change led by senior management. Several common mistakes were identified like having an inadequate idea of what digital transformation is, trying to do too much at the same time, centralizing responsibility in one department, resistance to change from leaders, the board's impatience with a short-term focus, making large investments expecting quick returns, and making minimal investments expecting high impact. The strategic path for companies includes mapping customers' journeys and eliminating pain points, meeting unmet needs, radically improving consumers' experience, personalizing the offer using digital tools, and fostering customer engagement. Senior management must lead this process, promoting cultural and organizational change, focusing on customers, and adopting new technologies and methodologies to improve consumer experience and competitiveness in digital markets. Digital transformation was a need accelerated by the pandemic, which forced companies to adapt quickly to survive and thrive in a highly competitive digitized environment. [32]

The digital transformation of companies in Mexico is significantly influenced by exogenous factors that can favor or inhibit their progress. Among the critical factors are the country's technological, political, and social environment. The integration of emerging technologies, such as artificial intelligence, the Internet of Things, and cloud computing, is essential to increase business efficiency and reduce costs. However, a lack of adequate infrastructure, limited access to technology, and a shortage of digital skills among the population are major barriers. Public policies play a crucial role in digital transformation. Mexico's National Digital Strategy seeks to improve technological infrastructure and reduce the digital divide but faces challenges due to bureaucratic processes that delay its implementation. Furthermore, a lack of clear effective regulations in emerging technologies and cybersecurity hinders the advancement of digital transformation in companies. Cybersecurity is another relevant exogenous factor. Cyberattacks have increased, highlighting the need to

improve security measures and staff training in this field. Businesses must integrate cybersecurity into their business strategy to protect their data and operations. Human resources with technological skills are essential for digital transformation. Training and retaining talent specialized in emerging technologies is essential to the success of this process. Companies need professional profiles that understand both technology and cybersecurity to drive digital transformation effectively. [33] Exogenous factors, such as public policies, cybersecurity, and human resources, are determining factors in the digital transformation of companies in Mexico. These factors require attention and adaptation to overcome challenges and take advantage of the opportunities offered by digitalization in a competitive global environment.

Digital transformation is no longer an alternative for organizations. It is an important requirement for competitiveness in agile environments in all industries, with an emphasis on the use of digital technologies. In particular, mobile technology can have a positive impact on productive, commercial, and service processes. The ability to obtain information in real-time and its application in analysis is highlighted, and has a significant effect on innovation, the distribution of goods and services, and the dissemination of knowledge. With this, generating a strategic positioning of organizations is crucial, as well as the opportunity for growth, competitors' rivalry, demand conditions, and customers' sophistication.

5 DIGITAL MATURITY

"Digital transformation seeks to integrate technologies associated with Industry 4.0 into all areas of the business to fundamentally change the way they operate and deliver value. It is therefore a process based on continuous improvement with the ultimate goal of reaching digital maturity" [34]

Another element of digital transformation is digital maturity, which is defined as "a certain state of social and economic awareness that allows companies to implement digital technologies effectively to achieve their objectives" (Brodny and Tutak, p.3) [34]. A simpler way to explain what digital maturity is according to Brodny and Tutak [34] is the number of processes that a company has in which it uses new technologies. To the extent that companies have this awareness or implement new technologies in their processes, they will obtain various advantages or benefits, and one of the main ones is better strategic positioning.

A third definition is provided by Eremina, Lace & Bistrova [35] who explain that digital maturity is a company's "willingness and ability to change and apply innovative technologies, according to trends, to remain competitive in the market" (p.2) [35] Continuing with digital maturity Deloitte and MIT Sloan, as cited in Eremina, Lace

& Bistrova define digital maturity as "adapting an organization to compete effectively in an increasingly digital environment" [35]

Digital maturity has been studied and analyzed by various authors who agree that this is an issue that involves multiple levels and criteria, which they have tried to define or establish to measure or evaluate companies. In this regard, Erol et al. cited in Sundberg, Gidlund, & Olsson [27] describe a three-stage model for strategic work in which companies must, first, have a common understanding (understanding), then, define routes or success factors (enablers) and finally operationalization in the form of concrete projects (enactment).

In a study carried out in medium-sized companies, in Colima Mexico, where digital maturity was carried out, there was a variability in the responses. They point to a general acceptance of the importance of culture, organization, and technology in digital maturity, although they have some disagreements regarding the usefulness of data-derived insights to drive a digital strategy. The latter may indicate a significant field of opportunity for companies to improve their understanding and use data in decision-making and in shaping more effective digital strategies. The impact of digital maturity on the competitiveness of these companies was reflected in their ability to adapt to the demands of today's digital market. Adopting advanced technologies effectively and integrating a strong digital culture facilitates the optimization of operations and the improvement of customer satisfaction, which is essential to maintain competitiveness in an increasingly digitized economic environment. [36]

Schumacher et al., also cited in Sundberg et al.. [27] made a synthesis of models to analyze the level of digital maturity of companies incorporating nine indicators in two groups: Organizational enablers like strategy, leadership, culture, people, and governance, and basic enablers like customers, products, operationalization, and technology. Finally, Sundberg et al. [27] analyze the contribution of Ek from the OECD and talk about four indicators used to evaluate an organization's digital maturity. They are businesses based on IT systems, customer management systems, the use of media and social networks, and market and integration.

On this same subject, Sundberg et al. [27] extracted seven variables concerning the way organizations perceive the potential to digitize in their various departments cost reduction, sustainability, new business model development, an increase in productivity, new market research, and marketing purposes. Likewise, Colli, Madsen, Berger, Møller, Wæhrens & Bockholt [37] conducted research in which they presented four models of digital maturity for the industry including their stages, dimensions, and characteristics. A summary of these models can be found in Table No. 1.

Table No. 1

Model Name	Maturation Stages	Dimensions	Feedback
SIMMI 4.0 model Leyh et al. (2016)	Five Stages: Basic Digitization Interdepartmental digitalization Horizontal and vertical digitization Complete digitalization Complete optimized scanning	Four dimensions: Vertical integration Horizontal integration Digital Product Development Cross-cutting technological criteria	Focus on an IT landscape -General activities that make stage transitions possible are presented.
Schuemacher et al. (2016)	Likert scale of: 1: Not distinct 2: A little different 3: Something Different 4: Quite different 5: Very different	Nine company dimensions, which are subsequently converted into 62 maturity elements: Strategy Leadership Clients Products Operations Culture People Governance Technology	General Questionnaire
ACATECH Schuh et al (2015)	Six Stages: Computerization Connectivity Visibility Transparency Predictive Capability Adaptability	Four dimensions (Industry 4.0 capabilities), each defined by two principles: Resources Information Systems Organizational structure Culture	The capabilities of each company department are examined Questionnaire combined with visits
IMPULS Lichblau et al (2015)	Six stages: Stranger Beginner Intermediate Experienced Expert Better performance	Six dimensions are further detailed, in 18 fields: Strategy and organization Smart factory Smart Operations Smart Products Data-driven services Employees	Online Self-Assessment -Actions for stage transitions are presented.

Source: Prepared with information from Colli, Madsen, Berger, Møller, Wæhrens & Bockholt [37]

Based on these models, Colli et al. [37] generated their own model to assess an organization's digital maturity by taking the elements of these models and integrating them into 6 levels of maturity: None, basic, transparent, conscious, autonomous and integrated. These levels are analyzed from six dimensions: Governance, technology, connectivity, value creation and competition.

Another contribution to the song is made by Brodny and Tutak [34] who investigated ten different models to measure or evaluate the digital maturity of companies. The models they analyzed were:

1. A maturity model for Industry 4.0 readiness
2. The degree of readiness for the implementation of Industry 4.0
3. An overview of a smart manufacturing system readiness assessment
4. A Connected Enterprise Maturity Model
5. IMPULS: preparation for Industry 4.0
6. Digital readiness for Industry 4.0
7. SIMMI 4.0
8. Aiming at a smart manufacturing maturity model for SMEs
9. Logistics 4.0 maturity model
10. An Intelligence Assessment Framework for Smart Factories Using an Analytical Network Process.

Based on the analysis of these models, Brodny and Tutak [34] opted to use a multidimensional model that included many of the elements of the previously mentioned models. Similarly, Halpern et al. [38] analyzed various existing models to integrate them into their model focused on airports called ADMM (airport digital maturity model) and consisted of four levels (1.0 analog processes, digitalization, 2.0 and 3.0 are different levels of digitalization and 4.0 is digital transformation). Another model is the one generated by Deloitte and TM Forum [39], known as DMM (Digital Maturity Model) which is a digital maturity assessment tool that measures companies' capabilities through 5 business dimensions including customers, strategies, technologies, operations, organization, and culture. These five dimensions are divided into 28 sub-dimensions, which gave rise to 179 individual criteria with which Eremina, Lace & Bistrova's digital company maturity could be assessed [35]

From the models mentioned above, there are a wide variety of models or ways to evaluate and measure the digital maturity of a company, however, why is it so important to do this? As expressed by different researchers including Eremina, Lace & Bistrova [40] "Increased digital maturity leads to superior performance and profitability effects on product quality and customer satisfaction" [39]. This is why there is so much emphasis on identifying and measuring an organization's degree of digital maturity.

Para Nasiri, Saunila & Ukko [41] in a study identified three key antecedents of digital transformation digital orientation, digital intensity, and digital maturity. Digital orientation reflects a company's commitment and openness towards the use of digital technologies, while digital intensity refers to the number of departments in the company managed through digital solutions. Digital maturity, on the other hand, is a systematic continuous adaptation process to changing digital landscapes. The study found that neither digital orientation nor digital intensity, alone, guaranteed a company's financial success. In fact, digital intensity can reduce the positive effects of digital targeting on financial performance. However, digital maturity acts as a positive mediator between digital orientation and financial success, as well as between digital intensity and financial success. This means that companies that achieve a high digital maturity level, combining a clear strategic vision with appropriate technology investments, are more likely to realize significant financial benefits.

6 DIGITAL CAPABILITIES

Regarding digital capabilities, Freitas Junior & Maçada [42] researched the definition of digital capabilities and found the following definitions:

- It is an entrepreneurial capability developed by the interaction of technology with a variety of complementary assets, such as process redesign, training, and incentive structures, which can be considered sources of business value. [43]
- It is the organizational capacity "used in an organization to support its different functions based on Digital Technology Platforms" Yoo et al. [44]
- "Skills needed to go beyond pure IT to include specific technologies, such as social media or mobile devices, as well as analytical skills to generate value from big data." Westerman, Bonnet, and McAfee [20]
- "It can be conceptualized as services that one system provides to another through provider-user interactions that create value." Srivastava and Shainesh [29]
- A digital capability is "an organization's focused implementation of information and communication technologies (ICT), skills to develop, mobilize, and use the organization's resources effectively, e.g., customer relationship management, new product development, and knowledge collaboration." Tams, Grover, and Thatcher [23]

In summary, Freitas Junior & Maçada [42] generated their definition of digital capabilities. "Digital Capabilities are a combination of Digital Businesses' skills and processes to develop, mobilize, and use organizational resources supported by Digital Technologies to respond to the environment and add value to the organization" [42]

On the other hand, Saputra, Sasanti, Alamsjah & Sadeli [31] explained that in a digital economy, a business's success depends largely on how well a company can explore and exploit digital technologies. Technological capability is considered as an organizational ability to create and build new products and related processes. (p.328) [31]

This capability is defined by these authors as an organizational competence, experience, and talent to operate digital technology to develop new products or services.

From the above definitions, it can be construed that digital capabilities are a set of skills, interactions, and actions that an organization has to use digital technologies or tools properly and generate products, services, or value. Interest in digital capabilities is based on the fact that "digital capabilities can create new business value and meet the challenges of a digital economy" [42] These authors continue their research by adding that digital capabilities are made up of four elements perception, sensitivity, process digitalization and ecosystem connectivity.

Companies' digital capabilities are essential to improve market competitiveness, as they allow business model innovation and adaptation to market demands. Digital capabilities include the use of advanced technologies such as artificial intelligence, the Internet of Things, cloud computing, and big data analytics, which facilitate improved operations, value creation, efficiency, and customer satisfaction. These capabilities upgrade internal processes, and drive digital transformation, allowing companies to innovate in their business models and adapt quickly to market changes. The relationship between digital skills and market competitiveness is mediated by factors such as a circular economy and business model innovation. Adopting circular economy practices allows companies to use their resources more efficiently, reduce production costs, and minimize environmental impact, which in turn improves their competitive market position. In addition, business model innovation, facilitated by digital capabilities, allows companies to create new ways to deliver value to their customers, which is crucial to remain competitive. Digital capabilities are essential for companies to innovate in their business models and improve their market competitiveness. Circular economy and business model innovation are important mediators in this relationship, while exogenous factors, such as energy policies, can significantly influence the success of digital transformation. To maximize the benefits of digitalization, companies must develop their digital capabilities and adapt to market conditions and external policies. [45]

When analyzing the impact of digital capacity on companies, Freitas Junior & Maçada (2020) [42] found that digital capabilities improve the performance of digital businesses. This allows greater communication and collaboration in organizations, as well as better decision-making and customer satisfaction, eventually impacting cost reduction and increased profits. This coincides with Saputra, Sasanti, Alamsjah

& Sadeli's findings [31] who found that an organization's digital capabilities have a positive impact on performance and leadership performance in the company.

7 SMES IN MEXICO

Small and medium-sized SMEs are an important part of the economy and employment of a vast majority of countries in the world. According to Baltodano-Garcia & Leyva Cordero [34] these types of companies represent more than 99% of all companies in the world, contributing around 50% of the workforce and 50% of the world's GDP, which makes them a particularly important segment to analyze and seek to develop. In the same sense, López-Mayorga [46] comments that this type of company absorbs the majority of an economically active population.

> *Although it is true employment generated by SMEs is higher compared to that of large companies, at the same time, they represent the majority in productive units, but not in their contribution to production, since they constitute economic sectors with the lowest labor productivity (ECLAC, 2018) Baltodano-García & Leyva Cordero* [47]

On this issue of productivity of SMEs, according to the OECD (2017), as cited in Baltodano-García & Leyva Cordero [47], Mexico has one of the largest gaps among the countries belonging to this organization, which makes public and private sector work in these companies even more pressing.

According to Ayala [48] in Mexico, only 6% of SMEs use ICT in their production and marketing processes and they conclude that the use of technology is an important aspect for these companies to consider to improve their operations. SMEs are the largest number of companies in Mexico. They capture a very important part of jobs and also generate a significant part of the GDP. However, their productivity is not good and a very small part of them use any type of technology. In addition to the above, these companies train their employees very little and generate very little innovation or development, which leads them to a perpetual cycle of low efficiency, productivity, and results.

Dynamic management capability challenges concerning company digitalization include a lack of knowledge and experience in e-commerce, which limits the adoption of advanced strategies. It is crucial to develop organizational capabilities, create dedicated teams, and modify processes to operate in digital environments efficiently. Adopting easy-to-use digital commerce tools should evolve towards more advanced technologies. International marketplaces offer significant support, but their effectiveness depends on a company's ability to leverage them. SMEs face financial and human capital constraints, so they must look for ways to overcome these barriers, such

as outsourcing functions or hiring experts. Managers' cognition, social capital, and human capital are critical to driving strategic change. Managers must identify market opportunities, make informed decisions, and lead digital transformation. Businesses also face regulatory and technological hurdles that they must overcome to maximize opportunities in cross-border e-commerce. [49]

The use of the digital tools mentioned in this research and the digital transformation of this type of company could undoubtedly help obtain better results in terms of productivity, service and revenue, which would allow bettercompany positioning.

As a result of the analysis of SMEs in Mexico, we can see in existing reviewed studies that these types of companies and what they generate are fundamental in most countries' economies and employment, including Mexico. These organizations represent a very important part of the total number of companies in Mexico and in the world, contributing around 50% of the workforce and 50% of the world's GDP. In Mexico, similarly, SMEs capture a very important part of jobs and also generate a significant part of GDP; however, their productivity is not good, in addition to the fact that only a very small part of SMEs use any type of technology.

SMEs' technological capability in Mexico is a crucial factor for their competitiveness and innovation in a globalized market, also an essential indicator of a company's technical situation and encompasses the selection, adaptation, and improvement of technologies, as well as the development of internal technology. These capabilities enable companies to innovate and compete effectively in the marketplace. However, Mexico is below an expected technological development level compared to other countries. Mexican SMEs face several challenges, including a lack of financing and trained personnel, resistance to change, and a limited strategic vision. Despite these obstacles, increased funding for technology development projects has proven to be beneficial. Between 2013 and 2017, research and technological development budgets increased 74% which allowed the carrying out of more projects and integrating more researchers. This requires investment in machinery and software, staff training, and adapting to new technologies. [50]

Furthermore, as Ayala comments [48], only 6% of SMEs in Mexico use ICT in their operations. Adopting to digital tools and transformation are crucial aspects to improve SMEs' productivity, services, and income, which in turn allows them to better their market position.

8 RESEARCH RESULTS

This research was conducted employing a heuristic and hermeneutical process, that analyzed 60 scientific documents on change management and strategic planning in Mexican organizations. Information collection, análisis, and processing techniques were used, focused on SMEs' process digitalization, digital transformation, digital maturity, and digital capabilities. The selection of documentary sources was based on criteria including relevance, number of citations, quartile of journals, and H-index of the research.

Research findings reveal a positive relationship between SMEs' digital maturity and digital capabilities in Mexico, and their impact on business performance, productivity, and customer satisfaction. The study highlights that process digitalization is a prevailing reality in various industries, where adopting digital technologies transforms operations and business models. Digital maturity is defined as a continuous improvement process that seeks to integrate digital technologies to fundamentally change the way companies operate and generate value.

Regarding digital skills, their importance is emphasized for SMEs' effective management of digital technology and innovation. The study underlined that these capabilities are essential to respond to a digital environment and add value to an organization. In addition, the study highlights that digital capabilities can create business value and meet the challenges of a digital economy.

9 DISCUSSION AND FUTURE WORK

Regarding digital maturity and digital capabilities, the study deems worthwhile to continue with this study assessing maturity and digital capabilities in companies or industries in Puebla, Mexico, in large, small, and medium-sized industries to observe their similarities and differences and based on this generate specific strategies or lines of action to compare maturity and capabilities of companies of one size with another size company, or to seek to improve the maturity and capabilities of both sizes and bring them to the level of the world's leading companies and countries.

The elements analyzed in this research show that they have positive impacts on various organizations' objectives or key indicators, such as performance, productivity, etc., so with this companies can take advantage of this information to use it in their favor integrating the aforementioned technological elements, tools or technologies to obtain the benefits that leading companies worldwide have obtained using these elements.

CONCLUSIONS

Digital transformation is a reality and companies are getting closer every day to being able to have access to various technologies and carry out comprehensive projects through which they can digitize processes, with secure technological tools and proven implementations used in other companies with similar processes.

A need for digital business transformation in the world highlights the progress and shortcomings in this process, emphasizing the importance of public and private sector collaboration to promote company digitalization and innovation.

After this technological review, SMEs must be very clear about their business model and evaluate the relationship they have with technological aspects and the possibilities they have to be able to digitally transform processes and the impact that will have on their customers and their strategic partners.

This study highlights the importance of process digitalization, digital transformation, digital maturity, and digital capabilities in today's business context. It is evident that the adoption of digital technologies has a positive impact on productivity, customer satisfaction and business performance. Moreover, the need for organizations to develop hard and soft skills to meet the challenges of digital transformation is underscored.

SMEs, after this technological review, must be very clear about their business model and evaluate their relationship with technological aspects, and the possibilities of being able to digitally transform processes and the impact that will have on their customers and their strategic partners.

It is also important for you to assess your staff's technological capabilities and the technologies you currently use to evaluate the impact of the short and médium-term needs of being able to adopt a new technology.

Process digitalization is an inescapable reality that requires an organization's careful adaptation. It highlights the need to address challenges and seize the opportunities offered by digitalization to improve competitiveness and prepare for an increasingly interconnected digitized future. Attention to hard and soft skills, as well as recognition of influence on market communication, add depth to the understanding of this transformative process.

Despite the comprehensiveness and clarity presenting models and approaches, the variety of digital maturity models is very diverse and can pose challenges for organizations looking to apply these models, like choosing the most appropriate approach

for their specific context could be complicated. Model diversity might require further guidance for practical application in a business context.

Digital capabilities integrate an organization's skills to give customers products, services, and value. The fact that organizations have the aforementioned capabilities allows them to improve in multiple vertices including productivity, profits and customer service. This makes digital capabilities an important element to consider having or obtaining for any organization aiming to improve those aspects.

This research highlights the opportunity that digital transformation represents for SMEs in Mexico, suggesting that implementing digital tools can significantly improve productivity, service, and revenue.

As recommendations, this study suggests that SMEs in Mexico prioritize improving their digital maturity and digital capabilities to stay competitive in an increasingly digitized business environment. These companies must invest in training their staff in digital technologies and implementing digital transformation strategies tailored to their specific needs.

For future studies, the following questions arised. What is the long-term impact of digital maturity on SMEs' profitability? What role does the government play in promoting SMEs' digitalization?

Regarding the constraints and problems faced during the study, a lack of research and initiatives by research agencies and the federal government as well as state governments in Mexico stands out. This hindered research and may hinder the implementation of large-scale digital transformation strategies in this country. Furthermore, SMEs' low adoption of digital technologies also represents a significant challenge so digital maturity may advance in Mexico.

In brief, digital transformation is a fundamental process for SMEs in Mexico, as it allows them to adapt to changing customer demands and the growing interconnection of products, value chains, and business models. This process involves adopting technologies and systems that transform companies' operations and business models. Digital maturity is a crucial aspect in this process as it allows companies to implement digital technologies effectively to achieve their goals. Digital transformation also influences organizations' strategic positioning, for it allows them to improve their competitiveness and prepare for the future in an increasingly interconnected digitized world. The government plays a key role as a facilitator in this process. Therefore, digital transformation is essential for SMEs in Mexico to stay competitive in an ever-changing business environment.

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