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Effects of IT and organizational capabilities on SME performance

Efectos de las capacidades TI y organizacionales en el rendimiento de pymes

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Abstract

The results of the effect of information technology (IT) on organizational performance have been contradictory, therefore have been proposed intervening variables to determine their effect, especially in SMEs in countries with emerging economy, since investments in IT are high. The purpose of this article is to analyze the effect of IT capabilities on organizational performance, through the strategic alignment of technologies, organizational learning and process agility, in SMEs in the state of Tamaulipas, Mexico. From the review of the literature a research model and a measurement instrument were developed. 388 questionnaires were obtained from SME owners or managers. For the analysis, the statistical technique of structural equation modeling was used. The results allow detecting that IT capabilities are relevant factors that should be considered due to their effect on both organizational capabilities and organizational performance, which helps SME owners or managers to recognize potential areas to invest, to optimize o enable their IT capabilities in support of better management of processes and customers.

JEL Code: M10, M15, L25
Keywords: organizational performance; IT capabilities; organizational capabilities; SMEs

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Resumen

Los resultados del efecto de las tecnologías de la información (TI) en el rendimiento organizacional han sido contradictorios, por ello se han propuesto variables intervinientes para determinar su efecto, sobre todo en pymes de países con economía emergente, puesto que las inversiones en TI son altas. El propósito de este artículo es analizar el efecto de las capacidades TI en el rendimiento organizacional, a través de la alineación estratégica de las tecnologías, el aprendizaje organizacional y la agilidad de procesos, en pymes del estado de Tamaulipas, México. A partir de la revisión de la literatura se desarrolló un modelo de investigación y un instrumento de medición. Se recopilaron 388 cuestionarios a dueños o gerentes de pymes. Para el análisis se utilizó la técnica estadística de modelado de ecuaciones estructurales. Lo resultados permiten detectar que las capacidades TI son factores relevantes que se deben considerar por su efecto tanto en las capacidades organizacionales como en su rendimiento organizacional, lo que ayuda a los dueños o gerentes de las pymes, a reconocer áreas potenciales donde invertir, para optimizar o habilitar sus capacidades TI en apoyo de un mejor manejo de procesos y de clientes.

Código JEL: M10, M15, L25
Palabras clave: rendimiento organizacional; capacidades TI; capacidades organizacionales; pymes

Introduction

Information technologies (IT) have been used by organizations since their inception (Ganju et al., 2015; Kim et al., 2011) due to the support they provide to business processes, as well as to the processing, management, and distribution of the information they generate to the areas that comprise it. Nevertheless, its investment cost has caused IT to be studied to determine its impact on organizational performance (Ashrafi & Mueller, 2015; Stewart, Coulson, & Wilson, 2007; Ong & Chen, 2014; Soto, Popa, & Palacios, 2016), for which most studies have used the Resource Based Theory (RBT), since it points out in its general precepts that, if a resource or capability is valuable, it must affect the company's competitiveness.

To this end, Peteraf (1993) mentions that organizations with superior capabilities save costs and thus perceive or receive a benefit. Then, if an organization develops and adapts its IT capabilities, it tends to improve processes and thus reduce operating costs, which can be seen as a return by organizations (Stewart et al., 2007; Coltman et al., 2015; Mao & Quan, 2015), which has led to a branch of research on how IT capabilities and their related variables influence organizational performance (Ashrafi & Mueller, 2015; Bhatt & Grover, 2005; Gu & Jung, 2013; Mithas, Ramasubbu, & Sambamurthy, 2011; Gautam, Xue, & Barney, 2013).

Nonetheless, the lack of consensus on the benefits obtained by its application gives an insight into important gaps that need to be addressed (Lu & Ramamurthy, 2011; Ong & Chen, 2014; Soto et al., 2016), given that the literature consulted shows that much of what has been done has been in developed countries and large organizations. Therefore, it is useful to assess whether these results also occur in SMEs

in developing countries, which would provide data that would encourage owners or managers of SMEs to invest in the creation or improvement of their IT capabilities, especially because their human and financial budget is limited (Neirotti & Raguseo, 2017).

It should be mentioned that the units of analysis are the SMEs of Tamaulipas, whose characteristics are very similar to those of Mexico as a whole, with life spans of at most 7 or 8 years, and with investment and human resources difficulties. In addition, the geographic location forces Tamaulipas SMEs to keep up with their main trading partners, companies in Texas. Therefore, it is important to assess the effects of technology in these organizations.

Thus, this research aims to measure the effect of IT capabilities on organizational performance through the constructs of IT strategic alignment, organizational learning, and process agility, all in the context of small and medium-sized companies in the main cities of Tamaulipas, Mexico. To achieve this, the document is structured as follows: the first part presents an introduction to the research problem, followed by the theory that supports both the relevance of the topic and the defense of the hypotheses proposed, the third section shows the method applied to obtain and process the data, and finally the results, conclusions, and future lines of research are presented.

Theoretical basis

One of the questions most frequently addressed by the administrative sciences is what elements contribute to organizational performance (Peteraf, 1993). This question arises from observations of the differentiation of results regarding organizational performance. One of the most recurrent explanations for these differences has been competitive advantage. This concept has given rise to another series of questions, including how to reveal its origin or sustain it over a certain period (Wernerfelt, 1984). Several researchers considered that the explanation of the competitive advantage of organizations, although it depended on external factors, arose from within the organization itself (Barney, 1991; Dierickx & Cool, 1989; Peteraf, 1993; Wernerfelt, 1984) since it was the organization that had the resources and skills, and therefore, how it managed them could explain its success or failure.

Based on the above, the theory of resources and capabilities (RBV), proposed by Barney (1991), establishes the importance of organizational resources as a source of competitive advantage under two assumptions: first, that these resources are not available under the same conditions for all organizations, and second, that these resources cannot be transferred to another organization without a cost, and in many cases, at the total loss of their value. In this sense, resources can be considered as competencies (Prahalad & Hamel, 1990), skills (Grant, 1996), strategy (Amit & Schoemaker, 1993), and assets (Becerra, 2008) so that organizations with superior resources and capabilities can be applied and combined to create and

sustain a competitive advantage (Peteraf, 1993). From this point of view, to determine that a resource or capability is superior, it must possess four attributes: valuable, rare, imperfectly imitable, and non-substitutable (VRIN) (Barney, 1991).

Nevertheless, history shows that the environment in which organizations compete is changing and that competitive advantages often cannot be sustained (Priem & Butler, 2001b, 2001a). Based on this, Teece, Pisano, and Shuen (1997) devise a more complete method by linking strategic decisions and environmental conditions, specifically defining dynamic capabilities as the organization's ability to integrate and reconfigure internal and external competencies in response to rapid changes in the environment.

Based on the above definitions, the next task was identifying which of an organization's resources and capabilities could be considered valuable and could have an impact on the competitive advantage and, therefore, on the organization's performance. In this context, IT, which is an increasingly commonly used resource in organizations and in which investment is increasing every year, may be considered a valuable resource whose strategic value must be evaluated and related with organizational performance. Accordingly, Mata et al. (1995) formulated the first propositions regarding IT capabilities and organizational performance, determining that IT management skills were the only characteristic that could be considered a VRIN resource.

Subsequently, Bharadwaj (2000) published one of the most significant empirical works of the time and even today (Mithas & Rust, 2016; Ong & Chen, 2014), finding that organizations with high IT capabilities do have a relation with organizational performance, mainly in financial results. Accordingly, Bhatt and Grover (2005) developed a conceptual model of the different IT capabilities and their role in competitive advantage, with theirs being one of the first works to include the relation of another party in the effect of IT capabilities and organizational performance. In addition, Kim et al. (2011) found that IT capabilities contribute to maintaining and even increasing financial performance even in times of economic downturn. Similarly, Ashrafi and Mueller (2015) developed a model that included building and shaping resources and capabilities.

Despite these efforts and more, the results were different and, in some cases, contradictory to the main thesis (Armstrong & Sambamurthy, 1999; Devaraj & Kohli, 2003; Lee, Sambamurthy, Lim & Wei, 2015; Mithas et al., 2012; Ong & Chen, 2016; Sabherwal & Jeyaraj, 2015; Santhanam & Hartono, 2003), i.e., the effects of IT on performance were partial or sometimes null (de Lima et al., 2016; Soto-Acosta et al., 2016; Wang et al., 2012). To respond to these contradictions, an extension of RBT was used, in this case, dynamic capabilities, which states that one resource may be able to reconfigure another to achieve competitive advantage. In other words, IT capabilities enable organizational capabilities by interacting with different resources (Barney et al., 2011; Crook et al., 2008); therefore, it was determined

that organizational capabilities were a construct that IT could enable and reconfigure to achieve better organizational performance (Bharadwaj, 2000; Dedrick et al., 2003).

This perspective makes it possible to evaluate the real effect of IT capabilities on organizational performance since the real effect can be conceived through organizational capabilities (Chae, Koh, & Prybutok, 2014). Therefore, efforts have focused on finding such organizational capabilities and measuring the effect of these on organizational performance from the support of IT capabilities (Pavlou & El Sawy, 2006; Kohli & Grover, 2008; Stoel & Muhanna, 2009; Fink, 2011; Tallon & Pinsonneault, 2011; Soto-Acosta et al., 2016). Nevertheless, these efforts have focused on assessing organizational capabilities individually.

Therefore, this paper seeks to determine the effect of IT on the relation between organizational capabilities and performance by integrating the three main intervening variables detected (IT strategic alignment, organizational learning, and process agility) from the research of Chae, Koh, and Prybutok (2014), Fink (2011), Kohli and Grover (2008), Nevo and Wade (2010), Parida, Oghazi, and Cedergren (2016), Soto-Acosta et al. (2016), and Tallon and Pinsonneault (2011), but which to date have been studied individually. In addition to this, there is the reality that an SME has limited resources, especially those related to IT, therefore its planning and implementation must be aligned with the business strategy (Coltman et al., 2015; Kaplan, 1992; Luftman, 2000; Pavlou & El Sawy, 2011), which would lead among others to increasing knowledge about its client (Bharadwaj, 2000; Fink et al., 2017; Mithas & Rust, 2016; Neirotti & Raguseo, 2017; Ong & Chen, 2016) and making its processes more efficient (Bharadwaj et al., 2013; Dubey et al., 2018; Mao & Quan, 2015; Setia et al., 2015) and thereby being able to respond to its environment in an agile and anticipatory manner, reflected in better organizational results (Battleson et al., 2016; Dubey et al., 2018; Kearns & Lederer, 2003; Luftman, 2000; Soto-Acosta et al., 2016). For all these reasons, a model is proposed (Figure 1) to measure their effect as a whole, while in the following paragraphs the theoretical justification of the proposed relations is set out comprehensively.

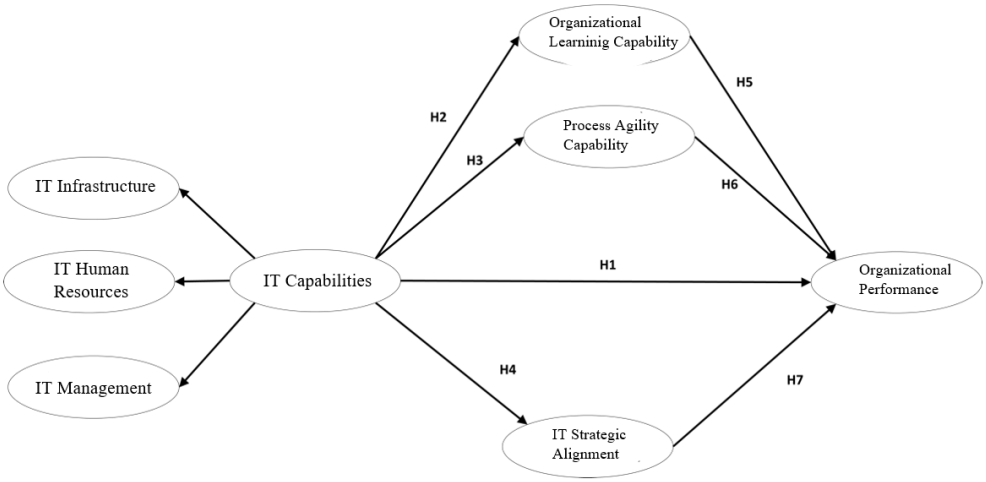

Figure 1. Research Model
Source: created by the authors

Regarding the direct effect between IT capabilities and organizational performance, Bharadwaj (2000) defined the concept of IT capabilities as the development and implementation of IT-based resources and capabilities in support of organizational activities. This conceptualization prompted a series of studies, including those by Kim et al. (2011), Lee et al. (2015), Liang, You, and Liu (2010), Sabherwal and Jeyaraj (2015), and Wade and Hulland (2004), aiming to determine the relation between IT capabilities and organizational performance, all based on the thesis that IT capabilities are a determinant resource for increasing organizational performance, so if a company develops and adapts them, they tend to improve processes (Ong & Chen, 2016).

Likewise, these studies made it possible to directly relate IT dimensions (administration, intangibles, infrastructure, budget, human resources, partners, proprietary technology) with organizational performance from different economic-administrative aspects (sales improvement, market position, and cost savings), finding that organizations with high IT capabilities tend to better organizational performance than those with less capabilities (Kim et al., 2011; Ong & Chen, 2016; Wu & Chiu, 2015), but from a developed country perspective. Nonetheless, Bhatt and Grover (2005), Doherty and Terry (2009), and Chae et al. (2014) found that only certain dimensions of IT capabilities had positive effects, so more dimensions of IT capabilities and especially other resources that mediate or moderate their impact on organizational performance should be included (Nevo & Wade, 2010; Soto-Acosta et al., 2016).

According to Kim et al. (2011), only a proper conjunction of IT dimensions enables the organization to exploit such capabilities and thus obtain improved organizational performance (Ashrafi &

Mueller, 2015; Bharadwaj, 2000; Neirotti & Raguseo, 2017; Sabherwal & Jeyaraj, 2015; Ong & Chen, 2016). The effects of IT capabilities on organizational performance have been studied in large companies (Kim et al., 2011; Ong & Chen, 2016; Wu & Chiu, 2015; Ashrafi & Mueller, 2015; Bharadwaj, 2000; Chen et al., 2014; Mithas et al., 2011), and results have been observed mainly in operational (Ashrafi & Mueller, 2015; Bhatt & Grover, 2005; Neirotti & Raguseo, 2017) and financial performance (Bharadwaj, 2000; Chen et al., 2014; Kim, 2017). Nevertheless, whether such a relation also occurs in small and medium-sized companies (Liang, You, & Liu, 2010; Soto-Acosta et al., 2016) remains to be investigated. For all these reasons, the following hypothesis of direct effect is proposed to compare the previous results, but now from the perspective of small and medium-sized companies in an emerging economy such as Mexico.

H1: IT capabilities are positively related to organizational performance in SMEs in Tamaulipas.

On the other hand, it is necessary to understand how IT capabilities influence organizational learning, process agility, and strategic alignment. According to Oliveira et al. (2016), the impact of IT capabilities is observed in the quality of information and the accumulation of organizational knowledge from it so that its collection, exchange, and application can be considered a dynamic capability (Peters, Wieder, Sutton, & Wakefield, 2016), which over time can be regarded as organizational learning (Dosi, Nelson, & Winter, 2001). Bharadwaj (2000) states that IT projects, which anticipatedly managed knowledge of the needs of the client and their workgroups, are delivered faster and with a higher degree of satisfaction, which in turn impacts learning and knowledge assimilation across the organization (Mithas & Rust, 2016; Parida et al., 2016; Fink et al., 2017; Cai, Huang, Liu, & Liang, 2016), as well as allowing new knowledge to be explored for the benefit of the organization (Ong & Chen, 2016; Soto-Acosta, Popa, & Palacios-Marques, 2016).

Similarly, organizations today must have the information available to make business decisions and communicate with people on a global scale. This allows them to improve and be more agile in the marketplace (Chan, Ngai, & Moon, 2017; Dubey et al., 2018; Liu, Wei, Ke, Wei, & Hua, 2016; Mao & Quan, 2015). This speed in increasing flexibility or changing a process or decision in the organization is known as organizational agility (Chen et al., 2014; de Lima et al., 2016; Lu & Ramamurthy, 2011), which can also be defined as the speed at which an organization modifies its business processes to respond to market conditions (Chen et al., 2014; de Lima et al., 2016; Liu et al., 2013) or upon detecting new opportunities (Battleson et al., 2016). In turn, Parida et al. (2016) also mention that the use of IT makes the internal processes of small companies more agile, which facilitates a faster strategic response to the client's requirements (Bharadwaj et al., 2013; Mao & Quan, 2015; Lu & Ramamurthy, 2011; Queiroz et al., 2018).

Regarding the relevance of proper IT management in the company, it is worth mentioning that the organizational strategy must go hand in hand with the technological strategy, known as IT strategic alignment (Jia et al., 2018; Oh, Yang, & Kim, 2014; Queiroz et al., 2018; Tallon & Pinsonneault, 2011), which enables the organization to build its technological capability in response to its strategic plan, so there must be coordination between IT and business strategy (Fink et al., 2017; Peters et al., 2016; Wade & Hulland, 2004). In addition, evidence has been found that there is a relation between alignment and organizational outcomes (Coltman et al., 2015; Pavlou & El Sawy, 2011).

Also, IT strategy alignment was found to positively support business processes through a common language between business and IT, a greater interrelation between the needs of the organization and the joint strategy so that the organization improves its ability to coordinate, respond, and adapt its business model (Brynjolfsson, 1993; Henderson & Venkatraman, 1993; Kaplan, 1992; Luftman, 2000; Zachman, 1987). The above enables a significant improvement in their organizational performance (Dubey et al., 2018; Kearns & Lederer, 2003).

Therefore, knowing how IT capabilities influence organizational capabilities (organizational learning, process agility) and how they should be aligned in SMEs in countries with emerging economies is of interest since knowledge of them is a means to establish or improve existing strategies for better performance. Therefore, the following hypotheses are proposed.

H2: An adequate level of IT capabilities is positively related to organizational learning capacity.

H3: Adequate IT capacity is positively related to the organizational agility capacity of SMEs.

H4: Having high IT capabilities is positively related to the strategic alignment capacity of SMEs.

Regarding the relation between organizational learning and organizational performance, Zhang et al. (2008) found that SMEs engaged in exporting, which base their processes on the creation, exploitation, and knowledge-intensive services, generate added value to their entire supply chain, unlike those who do not, so that an adequate knowledge management system translates into an advantage, and therefore into a better organizational outcome (Cai et al., 2016; Dubey et al., 2018; Fink et al., 2017; Mithas & Rust, 2016; Soto-Acosta et al., 2016). In addition, Neirotti and Raguseo (2017) mention that organizations evolve from their knowledge and experience, which permits the development of a variety of new competitive measures that improve organizational performance (Ong & Chen, 2016; Shrafat, 2018; Soto-Acosta et al., 2016). In the SME environment, the IT-based organizational learning capability is even more relevant, as it endows these types of companies with the ability to detect, interpret, and take advantage of new market opportunities (Neirotti & Raguseo, 2017; Setia, Richardson, & Rodney, 2015; Shrafat, 2018), which for an SME that invests in IT, enables it to leverage its technological resources, generate new initiatives over time, and experience, which helps it to launch a variety of knowledge-based measures (Shrafat, 2018; Soto-Acosta et al., 2016).

Bharadwaj et al. (2013) note that process agility is related to improved performance because agility supports better reaction to market changes (Chan et al., 2017; Dubey et al., 2018; Liu et al., 2016; Mao & Quan, 2015). The notion of IT capability underscores the importance of mobilizing and deploying IT-based resources and leveraging their value and other related resources and capabilities (Bharadwaj, 2000; Bharadwaj et al., 2013; Lu & Ramamurthy, 2011; Mao & Quan, 2015). In essence, the purpose of IT capabilities is to support the streamlining of the organization's business processes, and this streamlining translates into cost savings (Chen et al., 2014; de Lima et al., 2016; Liu et al., 2013).

In addition, Setia et al. (2015) found that the use of IT-based information systems is correlated with increased agility because it allows an organization to manage its inventory and operations, decreasing time and costs in these types of areas (Shrafat, 2018; Soto-Acosta et al., 2016). Consequently, companies with adaptive capabilities can meet client needs, improve client retention, and overall increase revenues while reducing costs (Chen et al., 2014; Coltman et al., 2015; Dubey et al., 2018; Mao & Quan, 2015; Parida et al., 2016). Therefore, the agility of the process supports IT capacity's impact on the company's performance.

IT strategic alignment (ITA) is another element to consider since every business has a strategy. Although many SMEs do not have such a markedly formal structure as large organizations, their verticality makes it possible to permeate the business and IT strategy more quickly, as stated by Cragg et al. (2002), Rivard et al. (2006), and Neirotti and Raguseo (2017). Therefore, it is of interest to assess the relation between ATI and organizational performance, given that such a construct brings together business and IT strategy as one (Jia et al., 2018; Oh et al., 2014; Queiroz et al., 2018; Tallon & Pinsonneault, 2011). Based on this, having a joint plan makes it possible to direct IT efforts to benefit the organization's vision (Jia et al., 2018; Queiroz et al., 2018), and therefore, such coordination results in improved cost savings and financial results (Dubey et al., 2018; Fink et al., 2017; Kearns & Lederer, 2003; Peters et al., 2016; Wade & Hulland, 2004); nevertheless, there is the question of how formal this phenomenon is in an SME (Cragg et al., 2002).

Therefore, it is possible to denote the importance of IT capabilities, especially for SMEs, while recognizing the need to manage and align them. These capabilities must provide efficient information to convert it into knowledge and thus understand their current environment to make quick but well-informed decisions and actions. Especially if the context in which the fieldwork is to be done is considered, that is, a state (Tamaulipas) that belongs to a country with an emerging economy, where this type of company is also the bedrock of the economy. It is, therefore, appropriate to propose the following hypotheses.

H5: Organizational learning is positively related to organizational performance in SMEs.

H6: Process agility has a positive and significant relation with organizational performance in SMEs.

H7: Strategic alignment is positively related to the organizational performance of SMEs.

Method

Due to its characteristics, the present research uses a quantitative focus of explanatory scope. An instrument was created to achieve the proposed objective based on a review of the specialized literature that supported data collection. Nevertheless, it shows that IT capabilities, strategic alignment of IT, learning, agility, and organizational performance are often difficult to estimate. Therefore, in the case of IT capabilities, it was decided to consider three dimensions (infrastructure with 4 items, IT skills of human resources with 3 items, and IT management with 4 items), i.e., as a second-order variable. The items to measure them were compiled and adapted from the research of Zhang et al. (2008), Kim et al. (2011), Ashrafi and Mueller (2015), Chen et al. (2014), Neirotti and Raguseo (2017), and Sabherwal and Jeyaraj (2015).

3 items from previous research by Kearns and Lederer (2003), Tallon and Pinsonneault (2011), and Pavlou and El Sawy (2011) were applied to measure IT strategic alignment capability. Meanwhile, the items (6) of the process agility and organizational learning scales are adapted from research by Mithas et al. (2011), Lu and Ramamurthy (2011), and Bhatt and Grover (2005). The organizational performance variable is constructed based on the research of Wang et al. (2012) and Kim et al. (2011). It should be noted that this variable is composed of two factors: financial performance and process efficiency. The financial performance factor includes indicators of the company's own financial profitability and comparative profitability with the competition. In addition, it was decided to use the operationalization of cost savings for the process efficiency factor. The result was a questionnaire consisting of two sections, one for general data (9 questions) and the other for 25 items on a 7-point Likert scale (1 strongly disagree to 7 strongly agree).

The research subjects are SMEs (companies with 11 to 250 workers) in Tamaulipas (Mexico). Information provided by INEGI (2019) (Spanish: Instituto Nacional de Estadística y Geografía) was consulted to determine its population, giving a total of 7082 SMEs in the selected study area. The next step was calculating the required sample size using the formula for the finite and known population of Münch and Ángeles (2007), which was 365 companies. Concerning the collection process, it was non-probabilistic and convenient during the third quarter of 2019, through personal interviews with owners or general and accounting managers from the main cities of the state of Tamaulipas: Nuevo Laredo (88 SMEs), Reynosa (67), and Matamoros (62); from the central area of the state, the capital Ciudad Victoria was selected (79) and in the southern area, the Tampico-Madero-Altamira conurbation (92). A total of 388 valid questionnaires were collected. Finally, the technique used to generate the statistical results was

based on structural equation modeling using the AMOS 24 statistical package, where the measurement and structural models were evaluated.

Results

First, the descriptive results of the SMEs surveyed show that 35% have a workforce of up to 30 employees, 19% with a maximum of 50, 14% for companies with between 31 and 100 workers, 14% for those between 51 and 100, and 18% for companies with a workforce of between 51 and 250 people. It was also found that 37% of the SMEs examined are consolidated (older than 15 years), 40% are between 6 and 15 years old, and 23% are newly created with less than 6 years.

On the other hand, to evaluate the results of the proposed theoretical model, the corresponding analysis was divided into two stages: first, the validation of the measurement model, followed by that of the structural model. The factor loadings of indicators, reliability, and construct validity were analyzed to evaluate the measurement model. The result was that the loadings of 5 items (Admin_TI3; Infra_TI2; AgPro_3; RendOrg_5) were within what was established and removed from the model. Regarding the average variance extracted (AVE) and reliability measured through the composite reliability index (CRI) of the constructs analyzed, what was obtained is presented in Table 1. As can be seen, they all meet the established criteria, which guarantees convergent validity.

Table 1
Internal consistency and convergent validity

Construct	Indicator	Item	Factorial loading > 0.7[1]	CRI > 0.72	AVE > 0.53
IT Capabilities (CTI)	Admin_TI1	IT solutions can be implemented.	0.845	0.882	0.714
	Admin_TI2	The IT area understands the business.	0.892		
	Admin_TI4	IT can be coordinated with other areas.	0.860		
	Infra_TI1	It has sufficient IT infrastructure.	0.733		
	Infra_TI3	IT is adapted to share data.	0.806		
	Infra_TI4	It has enough computers.	0.818		
	RecHum_TI1	Staff can handle different OS.	0.828		
	RecHum_TI2	Staff can provide IT maintenance.	0.905		
	RecHum_TI3	The staff diagnoses and provides solutions.	0.875		
Process agility (AgPro)	AgPro_1	Business functions can be modified.	0.899	0.918	0.849
	AgPro_2	It can be reorganized with IT.	0.943		
Organizational learning	AprOrg_1	IT is used to communicate with the client.	0.705	0.848	0.652
	AprOrg_2				

(AprOrg)	AprOrg_3	Information is shared within the organization.	0.832		
		There is an ability to communicate knowledge.	0.840		
	AliEst_TI1	Business and IT coincide in the value of IT.	0.874		
IT strategic alignment (AETI)	AliEst_TI2	IT and business exchange ideas.	0.900	0.905	0.761
	AliEst_TI3	IT procurement is driven by the business.	0.843		
Organizational performance (RendOrg)	RendOrg_1	Reduction in time to market.	0.842	0.862	0.604
	RendOrg_2	Improved financial results.	0.838		
	RendOrg_3	Increased transaction volume.	0.787		
	RendOrg_5	Profit margin increased.	0.704		

1: Hair *et al*. (2017); 2: Nunally and Bernstein (1994); 3: Fornell and Larcker (1981)
Source: created by the authors

Regarding the estimation of discriminant validity, the variance extracted test of Fornell and Larcker (1981) was applied, which determines that the variance extracted from each pair of constructs is lower than its corresponding AVE. The results are presented in Table 2, and as can be observed, the specification is fulfilled, supporting discriminant validity

Table 2
Discriminant validity

	RendOrg	AprOrg	AgPro	CTI	AETI
RendOrg	0.783				
AprOrg	0.650***	0.808			
AgPro	0.617***	0.693***	0.921		
CTI	0.581***	0.761***	0.686***	0.845	
AETI	0.632***	0.724***	0.754***	0.706***	0.873

Source: created by the authors

Continuing with the analysis of the data, the assessment of the structural model is now analyzed. Nevertheless, the model fit criteria should first be estimated. For this, the data obtained indicate that the X^2/gl ratio (491.79/ 242 and $p > 0.05$) gives a value of 2.032. However, the significance level is 0.00. As for the incremental fit indices, the Comparative Fit Index (CFI) and the Normed Fit Index (NFI) show values greater than or equal to 0.92. Meanwhile, regarding the absolute fit indices, the Goodness-of-Fit Index (GFI) gives a value of 0.9, and the Root Mean Square Error of Approximation (RMSEA) exhibits a value of 0.52. Table 3 shows more detail, but the model fit is acceptable (Browne & Cudeck, 1992; Hu & Bentler, 1995; 1999).

Table 3
Goodness of fit measures

Measure of Goodness	Indicator	Acceptable adjustment levels	Results obtained	Acceptability
Of fit	CMIN P value	CMIN = double the degrees of freedom, p-value = >.05	491.76 / 242 p-value = 0.000	Acceptable Marginal
	RMSEA	< 0.08	0.052	Acceptable
	PClose	> 0.05	0.332	Acceptable
Incremental	CFI	> 0.90	0.958	Acceptable
	NFI	> 0.90	0.921	Acceptable
	TLI	> 0.90	0.952	Acceptable
Of parsimony	CMIN/DF	>1 and < 3	2.092	Acceptable

Source: created by the authors

Once the assessment of the model fit has been completed, the calculation of the standardized path coefficients (β) of the causal relations established in the model is now performed. It should be noted that the β must reach a value of at least 0.3 to be considered relevant (Chin, 1998). The results obtained in this research for this category can be seen in Table 4, where only hypothesis 1 was rejected.

Table 4
Evaluation of the Hypotheses

Hypothesis	B	S.E	C.R	P	Contrast
H1: CapTI → RendOrg	-0.03	.197	-.1480	.883	Rejected
H2: CapTI → AprOrg	0.84	.074	10.735	***	Accepted
H3: CapTI → AgPro	0.80	.077	12.080	***	Accepted
H4: CapTI → AETI	0.82	.075	12.255	***	Accepted
H5: AprOrg → RendOrg	0.34	.122	3.029	.002	Accepted
H6: AgPro → RendOrg	0.50	.077	2.453	.014	Accepted
H7: AETI → RendOrg	0.24	.088	2. 492	.013	Accepted

Source: created by the authors

Regarding the value of the explained variance (R^2), it is estimated that values close to one indicate a higher degree of prediction of the model (Hair et al., 2017). Nevertheless, Crook et al. (2008) indicate that investigations based on the RBT obtained values higher than 0.2 are sufficient to be considered predictive, so from both assertions, the results obtained in the present work (Table 5) show that the model has an adequate level of prediction.

Table 5
Explained variance

Latent variable	R^2
AETI	0.670
AgPro	0.632
AprOrg	0.704
RendOrg	0.498

Source: created by the authors

Discussion of results

Hypothesis 1, concerning the direct relation between IT capabilities and organizational performance, was rejected as it was insignificant. Such a result is similar to the branch of studies in which it has been detected that the variable organizational performance does not capture the effect of investments in IT capabilities (Chae et al., 2014; Dewan & Ren, 2009; Lu & Ramamurthy, 2011; Wang et al., 2015), so the result obtained was as expected. Given that the real impact of IT capabilities cannot be measured directly in a company's performance, it is then inferred that the reflection of technology investments is derived from the combination with other variables, so it is worth analyzing the result of the subsequent hypotheses to support these arguments.

For the case of hypothesis 2, the results show a high and relevant path coefficient (0.84 and $p < 0.001$), which makes it possible to accept it since, according to Bhatt and Grover (2005), IT capabilities are suitable to be combined and distributed to the organization through learning, in addition to adapting and reconfiguring resources based on these. Therefore, such empirical evidence is reinforced (Fink et al., 2017; Mithas & Rust, 2016). For example, an adequate client management system using an IT tool can be used to to build a knowledge base, which is useful for an organization trying to adapt to the client's needs.

On the other hand, the values obtained in hypothesis 3, which refers to the relation between IT capabilities and process agility, were observed to have sufficient evidence to be accepted since a path coefficient of 0.80 and a significance of $p<0.001$ were obtained, which reinforces the findings of Liu et al. (2013), who stated that the value of technological capability was only observable if it was absorbed by the organization, in this case by business agility, i.e., for the case of this hypothesis it can be stated that IT capability was developed to improve organizational behaviors oriented toward the client and processes (Fuchs et al., 2018; Parida et al., 2016; Zablah et al., 2012).

Regarding hypothesis 4, about the effect of IT capabilities on strategic alignment, sufficient evidence was found to accept it, so it can be inferred that high technological capabilities have a positive and significant effect on their strategic alignment. The results are consistent with what has been found in other research, which identified that organizations with high IT capabilities tend to combine organizational

and IT strategies to solve problems together (Drechsler & Weissschaedel, 2018; Al-Surmi, Cao, & Duan, 2020).

Likewise, Sabherwal and Jeyaraj (2015) agree that developing technological capabilities is an antecedent of strategy. Therefore, building IT-based procedures usually makes aligning top management's strategy with IT strategy effective. It is also consistent with studies conducted in Taiwanese companies, where Wu and Chiu (2015) found that companies that strategically enabled and disseminated their IT capabilities through their strategic and technology investment plans were difficult for competitors to imitate.

As for hypothesis 5, which proposes that organizational learning impacts the SME's organizational performance, it was found to influence with a path coefficient of 0.84 and a significance level of $p < 0.001$, so it was accepted. This agrees with the findings of Fuchs et al. (2018), who found that adequate information management converted into learning within the organization reduced costs in client relations. The findings also align with the study by Oliveira et al. (2016), who mention that organizational learning enables the adaptation, reconfiguration, and integration of resources that contribute to organizational improvements. It is inferred that a company that actively learns from its clients or environment can improve market-related strategies, thereby reducing costs and improving organizational performance.

In hypothesis 6, which states that process agility affects organizational performance, the results show that it influences with a path coefficient of 0.50 and a significance level of $p < 0.01$, so it was accepted. This aligns with the findings of Chan et al. (2017) and Liu et al. (2016) in establishing that IT enabled organizations to streamline response times to processes, change, and innovation, thereby achieving better business outcomes. Therefore, since there is a positive relation, it can be inferred that process agility is an organizational capability that captures the value of IT capabilities and converts it into a better result for the organization.

Finally, for hypothesis 7, which analyzes the relation between strategic alignment and organizational performance, data were found that enable it to be accepted and prove that an SME with an adequate strategic alignment tends to obtain better organizational results. This can be explained to a large extent by the fact that an SME that has a formal structure of IT-aligned strategies is likely to make better decisions regarding its resources and present better results, which coincides with Queiroz et al. (2018) and Dubey et al. (2018) who found that alignment achieved high levels of flexibility and adaptability in the organization and consequently in cost savings, which led to improvements in the services offered by the organization and thus to an increase in its market share.

Conclusions

This research aimed to analyze the effect of IT capabilities on organizational performance through IT strategic alignment, organizational learning, and process agility in SMEs in the main cities of the state of Tamaulipas (Mexico). The findings strengthen the indirect effect line proposed in the literature, implying that measuring the direct effect of IT does not make it possible to estimate its real impact on the organization's performance. First, the IT capabilities variable was built multidimensionally based on the literature. This proposal made it possible to verify that these dimensions, which had already been found in large organizations, are also present in Mexican SMEs.

The results identified the causal relations between the intervening variables and organizational performance, which supports the thesis of the indirect effect of IT. The model proposes that the variables IT strategic alignment, organizational learning, and process agility contribute positively to the organizational performance of SMEs, which was empirically validated. Among these relations, it is observed that the strategic alignment of IT affects performance, which implies that the strategy is present in SMEs, despite some critics mentioning the non-existence of strategy in SMEs. The data of this research suggest that, although strategy in SMEs could be more formal if put into practice and aligned with IT, it generates better organizational results. In addition, it is inferred from the results that IT capabilities enable SMEs to build, deploy, and modify organizational capabilities according to the client's needs, thus recognizing the importance of the client in the learning and rollout of knowledge within the company. The implications of these needs help SMEs to develop their joint strategy (business and IT), and thus respond in a more agile way in their processes, based on the understanding of these needs.

Therefore, the proposed model validates the theory and assesses the causal effect of IT on organizational capabilities and its contribution to organizational performance. This enables SMEs to strengthen their IT capacity, as it impacts performance through intervening organizational capabilities.

This is significant because of the practical implications since these results help the owners or managers of SMEs to recognize the potential areas in which to invest to enhance their IT capabilities, beyond an investment in technological infrastructure, but rather an adequate implementation to support better management of processes and clients, such as client management systems, client knowledge matrices, analytical databases, technological plans to improve clients, and technological enhancement of sales channels, such as web page management and social networks.

On the other hand, there are some limitations. The results should be treated with caution since the data collected are a snapshot of a given time and geographic location. Future research can be directed at expanding the exploration of more variables related to organizational capabilities that capture the value of IT, thereby identifying which contribute the most and which translate into organizational performance.

In addition, some variables may be interrelated; some studies point to what is called the orchestration of capabilities, so it is relevant to consider how these constructs are interrelated.

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