INNOVAR. Revista de Ciencias Administrativas y Sociales
ISSN: 0121-5051
revinnova_bog@unal.edu.co
Universidad Nacional de Colombia
Colombia

Melchor Medina, José; Lavín, Jesús; Mora, Alberto; de-la-Garza, Isabel
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INNOVAR. Revista de Ciencias Administrativas y Sociales, vol. 21, núm. 42, octubre-diciembre, 2011, pp. 129-138
Universidad Nacional de Colombia
Bogotá, Colombia

REVISTA INNOVAR JOURNAL

Influence of information technology management on the organizational performance of the small and medium-sized enterprises

José Melchor Medina
Professor of information systems at Universidad Autónoma de Tamaulipas (UAT).
E-mail: jmedinaq@uat.edu.mx

Jesús Lavín
Professor of management quality at UAT.
E-mail: jelavin@uat.edu.mx

Alberto Mora
Professor of information technology at UAT.
E-mail: amora@uat.edu.mx

Isabel de-la-Garza
Professor of small business at UAT.
E-mail: igarza@uat.edu,mx

ABSTRACT: This research analyzes the degree of influence that the use of information management and information technology has on the organizational performance in terms of competitiveness, innovation, and productivity of the small and medium-sized enterprises in the central region of the state of Tamaulipas, Mexico. Data were collected by means of a questionnaire and analyzed by using a Partial Least Squares; the results show a greater support from the information technology and information management variables to innovation (standardized path=0.418 and 0.367, and p<0.05* both). This means that by having an efficient information management process, enterprises are able to get new goods/services, to identify new markets and to face competition.

KEYWORDS: IT, information management, competitiveness, innovation, productivity, SME.

INFLUENCIA DE LAS TECNOLOGÍAS DE LA INFORMACIÓN EN EL DESEMPEÑO ORGANIZACIONAL DE LAS PEQUEÑAS Y MEDIANAS EMPRESAS

RESUMEN: Esta investigación analiza el grado de influencia que tiene el uso de la administración de la información y la tecnología de la información en el desempeño organizacional en cuanto a competitividad, innovación y productividad de las pequeñas y medianas empresas en la zona centro del estado mexicano de Tamaulipas. La información fue obtenida por medio de un cuestionario y analizada con la herramienta estadística Partial Least Squares. Los resultados muestran un mayor impacto de las variables de tecnología y administración de la información en la innovación (coeficiente estandarizado=0.418 y 0.367 ambos a un nivel de confianza de p<0.05*). Esto significa que el contar con un proceso eficiente de la administración de la información, las empresas son capaces de obtener nuevos productos/servicios, identificar nuevos mercados y hacer frente a los competidores.

PALABRAS CLAVE: TI, administración de la información, competitividad, innovación, productividad, PYMES.

INFLUENCE DES TECHNOLOGIES DE L'INFORMATION SUR LE DÉVELOPPEMENT ORGANISATIONNEL DES PETITES ET MOYENNES ENTREPRISES

RÉSUMÉ: Cette recherche analyse le niveau d'influence de l'utilisation de l'administration de l'information et la technologie de l'information sur le développement organisationnel en termes de compétitivité, innovation et productivité des petites et moyennes entreprises dans la zone centrale de l'Etat mexicain de Tamaulipas. L'information obtenue par questionnaire a été analysée avec l'instrument statistique Partial Least Squares. Les résultats démontrent un impact supérieur des variables de technologie et d'administration de l'information sur l'innovation (coefficient standard =0.418 et 0.367 tous deux à un niveau de confiance de p<0.05*). Ceci signifie que si les entreprises utilisent un procédé efficient de l'administration de l'information, elles sont capables d'obtenir de nouveaux produits/services, d'identifier de nouveaux marchés et de faire face à la concurrence.

MOTS-CLEFS : TI, administration de l'information, compétitivité, innovation, productivité, petites et moyennes entreprises.

INFLUÊNCIA DAS TECNOLOGIAS DA INFORMAÇÃO NO DESEMPENHO ORGANIZACIONAL DAS PEQUENAS E MÉDIAS EMPRESAS

RESUMO: Esta investigação analisa o grau de influencia que o uso da administração da informação e a tecnologia da informação têm no desempenho organizacional em termos de competitividade, inovação e produtividade das pequenas e médias empresas na zona central do estado mexicano de *Tamaulipas*. A informação foi obtida através de um questionário e analisada com a ferramenta estatística *Partial Least Squares*. Os resultados mostram um maior impacto das variáveis de tecnologia e administração da informação na inovação (coeficiente padronizado=0.418 e 0.367 ambos em um nível de confiança de p<0.05*). Isso significa que ao contar com um processo eficiente da administração da informação, as empresas são capazes de obter novos produtos/serviços, identificar novos mercados e fazer frente aos competidores.

PALAVRAS CHAVE: TI, administração da informação, competitividade, inovação, produtividade, PYMES

JEL CLASSIFICATION: M1, M15.

SUBMITTED: April 2010 **ACCEPTED:** June 2011

ADDRESS: José Melchor-Medina, Universidad Autónoma de Tamaulipas (UAMCAV). C.U. Victoria, C.P. 87149. Victoria, Tam. México.

HOW TO CITE THIS ARTICLE: Medina, J.M., Lavín, J., Mora, A. & De-la-Garza, I. (2011). Influence of information technology management on the organizational performance of the small and medium-sized enterprises. *Innovar, 21*(42), 129-138.

Introduction

The post-industrial era in which we now live is characterized by the paradigm of knowledge and information management (IM), with relevant concepts such as globalization, the satisfaction of the particular customers' needs, lifelong learning and collaborative work at both the personal and organizational level. All this enables enterprises to identify the different perceptions associated with information as resource (Davenport and Prusak, 1997), as product, as process (Choo, 1998), and as organizational capability (Marchand et al., 2002). That is to say, the requirements of information emerge as a result of problems, uncertainties, and ambiguities encountered in specific individual and organizational situations and experiences. Choo (1998) sustains that information is an asset to any organization since it is not consumed as a result of its use. Moreover, it even improves as it is used and shared. However, the following types of questions may arise when dealing

with information management: What do we need to know? Why is it necessary to know? What seems to be the problem? What do we know about it so far? What do we expect to know? How do we need to know? In what form do we need to know? Based on these questions, two concepts emerge: One is the knowledge workers, which refers to those people who develop and use knowledge within a workplace (Tapscott and Williams, 2006). They are not the only ones who use knowledge, but they certainly dominate in the demands of the knowledge society. The other concept is knowledge management, which reflects the formal and operative dimension of the way in which knowledge is created, disseminated and assessed among the members of an organization as well as other social agents involved. However, Mexico is an emerging economy that has not been able to develop this concept in a harmonious way. In addition, in the region where this study took place, we believe that the enterprises' administrators have just started to be aware of the importance of knowledge and information management.

The notion of IM emerges along with the two concepts above. Wilson and Macevi (2002) define it as the application of management principles to the acquisition, organization, control, distribution, and use of information relevant to the organizations' effective operation. IM is associated with value, quality, property, use, and security of information in the context of organizational performance.

After having briefly presented the prevailing situation with respect to information and knowledge in the organizations, we now proceed to establish the aim of this present research which is to determine the degree of influence that information technology management has on the organizational performance in terms of competitiveness, innovation, and productivity of the small and medium-sized enterprises (SMEs) of the central part (where the capital city is located) of the state of Tamaulipas, Mexico.

In order to be able to achieve this aim, a research model is examined and tested in 96 SMEs of the services, commercial and manufacturing sectors. The quantitative empirical study is carried out through Partial Least Squares (PLS) statistical tool, which allows to evaluate complex models. The organization of the present paper is as follows: First, the literature review of the dependant and independent variables is presented; then, the research procedures (administration of the questionnaire, statistic analysis and the presentation of results) are described; finally, the conclusions and the description of this research's main contribution to knowledge are provided.

Literature review

Information technology (IT)

The majority of the enterprises view the new technologies as instruments to gain certain advantages and many of the times as tools to bring about a change in the business strategies and the institutional corporate processes. It has also been noticed that the promises of IT have not been fulfilled, and the so-called productivity paradox has been called into question, especially due to the big investment made by organizations in computers and technology hoping to obtain a substantial profit (Hitt and Brynjolfsson, 1996), to improve the performance, decision making, gain competitive advantage, and because of the influence it has on the strategy (Davenport, 2000), for the impact it has on the enterprises and for the changes in the businesses' environment. What is surprising about the paradox is that just when the technology adds amazing quantities, it has not been able to respond to the fundamental needs of the enterprise, even though there are studies such as that of Brynjolfsson and Hitt (1995) who found evidence that those enterprises that used IT to save labor costs were more successful than their competitors when increasing their productivity.

It is widely known that the performance in the improvement of IT cannot be materialized due to different reasons: It doesn't eliminate the exceptions, the organizational processes change, it is not the only one that affects performance, among others. This is why since the decade of the 1990's Scott-Morton (1991) proposed different reasons why the advancement in IT has not been translated into an improvement in the traditional variables used to measure the success of an enterprise (productivity and profit): (i) They are not immediately visible (for example, airplane reserves); (ii) they are not registered by enterprises (for example, ATMs); (iii) the environment of the enterprise becomes more and more difficult; (iv) the impact of IT is limited if its application is not accompanied by changes in the organization of the enterprise; and (v) the implementation of IT has not been able to respond to the fundamental needs of the enterprise (for example, little investment return).

While there is a general agreement among practitioners that the alignment of IT and the businesses is necessary, the pathway to achieve it is not completely clear. This is because the business strategies are firstly defined and the operations and the support strategies, including the technologies, are aligned with them (Feurer et al., 2000).

For example, Dibrell et al. (2008) argue that IT initiatives should be aligned with innovation. That is to say, in order to obtain a real integration between IT and the business strategy it is necessary that the very process of establishing the strategy incorporates ingredients of IT just as it does with other functions (commercial, sales, production, etc.), and according to Peak et al. (2005), this alignment involves the good use of the decisions of the IT resources for the achievement of the strategic objectives of the businesses (anticipation to the future requirements), tactics (location of resources) and operations (efficiency and effectiveness achievement) of the organization; because any change in the strategy and technology potentially results in a change in the values system, the culture and the structure of the organization teams (Feurer et al., 2000).

We need to understand that the alignment of the conduct of the businesses strategic units within the corporation and the alignment of the organization to IT with these units has been a top priority for many managers (Peak and Guynes, 2003). Therefore, enterprises need to integrate it into their business plans in order to ensure that they are aligned with their strategy. Galleta and Lederer (1989) also highlight the important role of it in the support of management decision making processes. They go on to suggest that SMEs should consider how they can apply IT to other strategic initiatives, such as customer responsiveness, in order to enhance overall effectiveness of the strategy. Similarly, Dibrell et al. (2008) contend that an appropriate use of IT may impact positively innovation, productivity and competitiveness. However, some researchers such as Heo and Han (2003) contradict this claim arguing that IT may lead to an increase in costs and affect management. This study intends to contribute to the debate about these issues.

Information management

All enterprises depend on information technology for the accurate and opportune management of information. However, many enterprises tend to collect large amounts of data from the entire organization. This raises the following question: Now what do we do with them? According to Oppenheim et al. (2004), information may contribute to the organizational effectiveness. They warn that the impact of it remains hidden until it is removed or lost. In other words, information makes sense only if someone uses it for something.

The quality principles advocated by Deming, Ishikawa, Juran, Crosby and other researchers are used for the improvement of the products quality. However, nowadays they are

also used in the improvement of information, applied to the problems of production of quality data output, where each information product has an intrinsic value for the user. The quality of information is defined as the measurement of IT data output in terms of being accurate, opportune, complete, reliable, and relevant (DeLone and McLean, 2003). According to Lillrank (2003) the most widely used definition is given by the American Society for Quality, and the most recent definition given by ISO 9000:2000 (2000) is based on costumer satisfaction. It is important to highlight that this definition places a strong emphasis on the idea that the requirements should not only be met for their own sake.

The emergence of information as a productive factor and development engine is now becoming evident in the wider society, where more and more time and resources are now being allocated directly or indirectly to its treatment, to the development and submission of reports data acquisition, and transference and load. This is so because from the very beginning IT made evident its potential for the improvement of information performance in the organization, since the availability of reliable information sources is a key component in the decision making processes of the executives as users (Leidner and Elam, 1995). These sources are selected as they are thought to be useful and, therefore, will offer the highest quality of information. This is so because there is evidence that the implementation of IT in the form of information systems leads to the improvement of its performance indicators such as data accuracy, speed in decision making processes, effectiveness and ability of data analysis.

Davenport and Prusak (1997) have argued that information plays a role in the facilitation of the exchange process with the value chain as part of its business strategy as the users need it to understand the meaning of the data and virtually, all the stakeholders in the enterprise (operators, executives, etc.) use information to produce more information.

Therefore, there is a need to take into consideration the following ideas about IM:

- The conception of IM should consider a transition from a focus on information process and storage to that centered on its use and share (Davenport and Prusak, 1997).
- IM should concentrate on people as its essential aim and consider IT as an enabling factor, perhaps necessary in the effective and satisfactory use of information (Marchand et al., 2002).

Undoubtedly, information is an intrinsic component in almost all the information activities in every organization to the degree of becoming transparent. This is so because it is the means through which people express, represent, communicate and share their knowledge. Marchand et al. (2002) highlight that it is the use of information which has an influence on the creation of business value through four strategic priorities: (i) Minimizing financial, commercial and operational risks, (ii) reducing costs of transactions and processes, (iii) adding value to costumers and markets, and (iv) creating new realities through innovation.

As can be seen, IM is an information technology trend that is having, or will have, a short-term impact on all types of businesses. For this reason, institutions should start to generate their strategies for the creation and application of this *new way* of competing not only at a local but also at a worldwide level.

Alter having reviewed the literature on IM, we now proceed to present the hypothesis of our work for this construct:

H_1: *Information technology is associated with a high level of information management in order to improve the organizational performance of the SME.*

Competitiveness

Enterprise competitiveness means to achieve an equal or higher profit than that of the competitors in the market. It is known that information and knowledge are two factors which have a remarkable impact on the conception and sustainability of the competitive advantages for organizations. IM provides organizations with the opportunity to either activate their new competitive strategies or to detect their competitors' response as a way to restructure the industry. Nevertheless, enterprises do not obtain any competitive advantage by merely having more computers at their disposal, but by being able to use them efficiently. More specifically, enterprises obtain competitive advantages by strategically applying the information generated or contained in them.

Mendelson (2000) developed a metric which quantifies an organization's ability to process information and make fast and effective decisions in a highly dynamic environment. He coined it as *organizations' intelligence quotient* which is based on the principles of an organizational architecture focused on the effective information flow, the speed in the decision making processes, and the utilization of knowledge resources when the environment generates big amounts of data whose effective process is key to success.

Undoubtedly, knowledge and information are two vital engines which help in the competitiveness and survival of many institutions in the world. In this way, Mexican enterprises are not sufficiently competitive to be able to occupy privileged positions at a worldwide level or to improve substantially the economic and social situation of the country.

For competitiveness, organizational performance needs to take into account both financial measures as well as operational performance measures (non-financial) such as market share, introduction of new products and services, product quality, marketing effectiveness, reputation improvement, flexibility, and operations promptness and productivity (Marchand et al., 2002). We need to place a strong emphasis on the organizational design that facilitates the vertical and horizontal information flows that aim to achieve the organization's objectives. In a similar vein, Melville et al. (2004) define the term *Business Value of IT* as the impact of IT on organizational performance observed at the level of intermediate processes and overall organizational level, including an impact on efficiency and competitiveness.

We now proceed to present the hypotheses of our work for this construct:

H_2: *Information management plays an influential role in helping the SME achieve higher levels of competitiveness.*

H_3: *Information technology plays an influential role in helping the SME achieve higher levels of competitiveness.*

Innovation

Innovation affects firms' ability to compete successfully in an increasingly global market (Madrid-Guijarro et al., 2009). In this sense, organizations not only need to pay attention to efficiency and productivity; they also need to promote innovation and their mechanisms to develop it, which support knowledge generation, sharing and integration (Albers and Brewer, 2003). These two researchers define innovation as the use of knowledge that offers a new product or service needed by customers, despite knowing that the adoption of a new piece of technology in an organization constitutes an innovation process (van den Hooff, 2005). In this sense, technological innovations such as IM can contribute to change the structure of the industry or can create new ones. For this paper, innovation occurs when an idea, process, service or product is established in the firm, and it faces competition efficiently.

Also, information, viewed as a valuable resource in an organization and managed appropriately, can stimulate innovation, accelerate the development of new products, increase the levels of productivity, ensure high quality standards, and through all these means, increase the competitiveness level and achieve a better organizational performance (Evans and Wurster, 1999). In the same way, the impact of innovation on performance (both profitability and growth) is primarily indirect and is instead fueled by IT (Dibrell et al., 2008). During the decade of the 1990's IT proved to be a particularly powerful innovation tool as it enabled the development of new products and helped improve business processes.

It is important to consider that the technological innovation variable is one of the twelve competitiveness principles of nations identified in the 2008 World Economic Forum. This variable needs to be promoted within the institutions, regardless of the benefits already gained through such innovation, of the construction of infrastructure, of the reduction of the macroeconomic instability, or of the improvement of the human resources of the population, especially because all these factors seem to run into diminishing returns (Sala-I-Martin et al., 2008). In this context, Mexico is ranked in the 70th position, which has started to become difficult to sustain due to the deceleration of many world economies, because one of the most significant barriers to innovation is associated with cost (Madrid-Guijarro et al., 2009).

Undoubtedly, innovation is a factor that any type of enterprise needs to consider if they are going to survive in these changing times. The SMEs are not an exception. They are also required to use the data generated within them, not only to compete, but also to survive. The hypotheses for this construct are:

H_4: *Information management plays an influential role in helping the SME achieve higher levels of innovation processes.*

H_5: *Information technology plays an influential role in helping the SME achieve higher levels of innovation processes.*

Productivity

Prosperity is determined by an economy's productivity and measured by the value of its goods and services produced per unit of the nation's human, capital and natural resources (Porter et al., 2008). Sala-I-Martin et al. (2008) stated that enterprises will depend to a great extent on their ability to adapt themselves to the existing technologies in order to increase their productivity. For this research, productivity enables enterprises to develop better decision making processes, more effective information usage and more efficient ways to identify new markets.

Technological innovations have the potential to change the market dynamics. In addition, as IT has become more important for enterprises, their executives demand more accountability, which requires the measurement of their productivity. In this context, the brief history of the IT shows that they arrived to the organizations precisely because they promised the automation of monotonous processes and a reduction of staff costs. In other words, they promised an increase in productivity. Nowadays, managers call into question the little benefit they obtain from the financial, human, time and effort investments they make, including all their risks involved in this process. This is so because according to Mahmood et al. (2000) investments in computers will be profitable only if they entail an increase in productivity. Nonetheless, the emergence of the IT Productivity Paradox came to exacerbate this situation due to the huge investments made, which most of the time are not reflected in the organizational productivity.

Some researchers wonder whether it is possible to maximize the IT performance if this is not done simultaneously with the restructuration of organizations. They go on to suggest that the overall aim of the construction of technological infrastructure should be to improve the organization, including a reduction in costs, an increase in competitive advantages, the solution of performance problems and, above all, an increase in organizational productivity. Runyan et al. (2008) found that SME's managers who adopt a personal orientation to business management (operating the business as an extension of personality and to further personal goals) are more likely to contribute to maximize IT performance.

With respect to the impact of investments in IT on the organizational productivity levels, positive and significant relationships have been observed and recognized lately. In another study, Farrell (2003) also recognizes this correlation, but framed and justified in highly competitive environments, and therefore, with a high demand for innovations. For this reason, information as resource allows the effective combination and utilization of other production agents. It is in itself a *meta-resource* that coordinates the movement of other assets in the organization performance.

As can be seen, the Productivity variable is very important for small and medium-sized enterprises. This is why we developed the following hypotheses for this construct:

H_6: *Information management plays an influential role in helping the SME achieve higher levels of productivity.*

H_7: *Information technology plays an influential role in helping the SME achieve higher levels of productivity.*

Method

The empirical work was carried out in the central part of the Mexican state of Tamaulipas. The literature of the variables to evaluate was first reviewed. A questionnaire was then designed with five open-ended questions and twenty eight five-point Likert-scale questions (1. Strongly Disagree [...] 5. Strongly Agree) that covered all the variables under study. The questionnaire was piloted with twelve enterprises; this led to the elimination of the items which did not have enough *loading* with the construct to be measured. Table 1 shows the categories included in the questionnaire as well as the original sources where each of the items or ideas was obtained:

TABLE 1. Original source of the constructs' items.

Construct	Number of Items	Source
Competitiveness	Four	Marchand et al. (2002), Farrell (2003), Melville et al. (2004), Oppenheim et al. (2004), Sala-I-Martin et al. (2008)
Innovation	Three	van den Hooff (2005), Dibrell et al. (2008), Madrid-Guijarro et al. (2009)
Productivity	Three	Hitt and Brynjolfsson (1996), Farrell (2003), Sala-I-Martin et al. (2008)
Information management	Four	Davenport and Prusak (1997), Marchand et al. (2002), Wilson and Macevi (2002), Oppenheim et al. (2004)
Information technology	Four	Hitt and Brynjolfsson (1996), Feurer et al. (2000), Farrell (2003), Melville et al. (2004), van den Hooff (2005), Dibrell et al. (2008)

According to the Mexican Entrepreneurship Information System (http://www.siem.gob.mx), in August 2009 there were 915 SMEs in the state of Tamaulipas, of which 121 were located in the study region–Cd. Victoria–(excluding microenterprises –with fewer than 10 employees). The final version of the questionnaires was administered to 48 enterprises (96 valid questionnaires, 2 questionnaires per enterprise), which represents 36.7% of the total number of enterprises. The instrument was administered to the two persons of the enterprise who are thought to be the ones who make use of information on a daily basis such as the general manager and the head of the computer department. The respondents were given approximately one week to respond to the questionnaire. This was done with the purpose of allowing them sufficient time and freedom to answer it. It is important to mention that the sample size used falls within the parameters allowed by the second generation statistics tool as recommended by Goodhue et al. (2006) and Gefen et al. (2000). The former recommend the use of at least 40 cases, while the latter recommend a

range of 30 and 100 cases. Nevertheless, the use of bootstrap is convenient when examining the stability of the estimations made, as they provide the standard errors and the *t-statistic* values (Barclay et al., 1995).

The collected data were analyzed by using the PLS Graph software (version 03.00 Build 1130), and bootstrapping (500 sub-samples). After that, the general and analytical description to create variables crossing, matrix correlations, factorial loadings and Average Variance Extracted (AVE) was developed with the purpose of verifying the designed hypotheses. Finally, conclusions were drawn taking into consideration the previous analyses.

PLS served to validate the research model in a holistic way. The results of this statistical tool also allowed to determine the model's reliability. Therefore, the measurement and structural parameters are considered simultaneously (analyzed and interpreted in two stages): Measurement Model and Structural Model.

Results

The data analysis showed that 38% of the respondents are females and 62% are males. 46% of the participating enterprises have 50 to 100 employees, 31% have up to 20, and 23% of them have 21 to 30.

a. Measurement Model

- Items reliability: The 18 reflective indicators present acceptable values (see Table 2); the loading factor ranges from 0.710 to 0.980, surpassing the minimum requirements of 0.707 (Chin, 1998).
- Internal consistency (constructs reliability): Table 2 shows that the internal (composite) reliability is given in this research, surpassing the minimum requirements in the Fornell statistical analysis of 0.707 (Fornell and Larcker, 1981).
- Convergent validity: The convergent validity of the survey measurement was right (Table 2), AVE exceeds in everything the 0.50 (the values range from 0.540 until 0.696) and the reliability of the items (load factor) in everything exceeds the recommendations made by Chin (1998) of 0.707. Re-sampling was coming out (500) for getting the *t-statistic* values; the results showed that almost everyone was significant, superior to 1.96 (Table 4).
- Discriminant validity: For it, the AVE square root was used (Fornell and Larcker, 1981). Therefore, the validity shown in Table 3 is examined (in diagonal); the variables meet the necessary condition.

TABLE 2. Individual reliability of the reflective indicators' loading and coefficients' convergent validity.

Construct	Item loading	Composite reliability	AVE	Explained variance (R^2)
Information management		0.879	0.696	0.521
IM1	0.889			
IM2	0.915			
IM3	0.901			
IM4	0.835			
Competitiveness		0.771	0.540	0.224
Com1	0.878			
Com2	0.766			
Com3	0.737			
Com4	0.831			
Innovation		0.824	0.650	0.395
Inn1	0.878			
Inn2	0.710			
Inn3	0.794			
Productivity		0.777	0.561	0.367
Pro1	0.844			
Pro2	0.897			
Pro3	0.718			
Information technology		0.846	0.682	Not apply
IT1	0.881			
IT2	0.833			
IT3	0.980			
IT4	0.793			

TABLE 3. Correlation of variables (discriminant validity).

	IM	Compe	Innov	Prod	IT
IM	0.834				
Compe	0.485	0.735			
Innov	0.511	0.523	0.806		
Prod	0.289	0.400	0.345	0.753	
IT	0.722	0.557	0.496	0.505	0.828

Note: Diagonal elements are the result of the square root of AVE. For the discriminant validity, these values should exceed the inter-construct correlations. IM (Information Management), Compe (Competitiveness), Innov (Innovation), Prod (Productivity), and IT (Information Technology).

b. Structural Model

Table 4 shows every planned hypotheses, indicating also that the values obtained are within the ranks of the previous parameters.

The Figure 1 shows the research model evaluated, where the data presented in the former table can be graphically appreciated. It also indicates the correlation levels between the proposed variables and their corresponding hypotheses.

TABLE 4. Summary of PLS Graph results.

Hypothesis	Coeficient Path	T-statistic	Remarks
Information management - Competitiveness	0.173	0.784	Not supported
Information management - Innovation	0.418	2.201	Supported
Information management - Productivity	0.158	0.911	Not supported
Information technology - Information management	0.722	3.405	Supported
Information technology - Competitiveness	0.432	1.989	Supported
Information technology - Innovation	0.367	2.175	Supported
Information technology - Productivity	0.619	2.676	Supported

FIGURE 1. Research model evaluated.

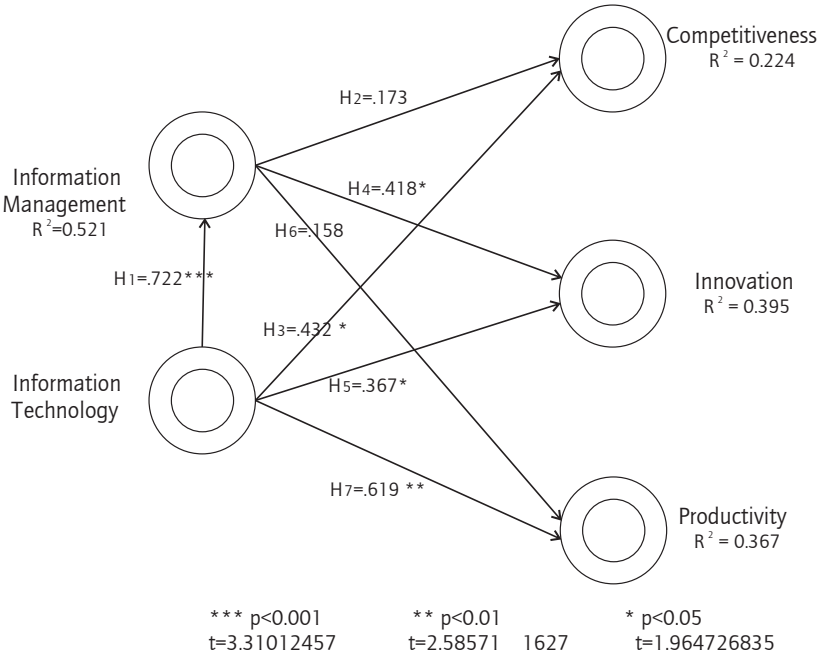

Figure 1 shows the relationship between dependent and independent variables. Of the 7 hypotheses, 5 were significant (71.4%, H1, H3, H4, H5 and H7) and 2 did not have significance (28.6%, H2 and H6). The analysis provides a strong relationship between information technology and the dependent variables; all together, the applied model has a good predictive power for the most variables applied, with 33% (in average of the dependent variables) from the explained variance (R^2), helping to understand the influence of IT on organizational performance.

As for information management, the SMEs do not seem to be aware of the importance of competitiveness (don't make an in-depth financial analysis, don't satisfy customers needs, don't have a good position in the market) and productivity (don't manage information properly; information doesn't appear to be important for the firm); they seem to use it only for Innovation purposes such as the opportunity to offer new goods/services, to identify new markets or to face competition.

With respect to information technology, it appears to have a great impact on organizational performance. It presents the four planning relationships (IM, Competitiveness, Innovation, and Productivity) like a hypothesis, with a good value of standardized path (0.722, 0.432, 0.367 and 0.619, respectively). Therefore, the SMEs consider computers very important for the improvement of the levels of efficiency not only in administrative processes but also in human resources management.

It is imperative to observe that the H1 (Information technology - Information management) has been supported. This means that technology is helping the SMEs to have a better control of processes and people. This has allowed them to have a privileged position in the market in which they develop competitive advantage and efficiency. Also,

it is the hypothesis with the greatest levels of reliability ($p<0.001$) and correlation (0.722).

Conclusions

The goal of this work is to determine the degree of influence that information management and information technology have on the organizational use of the SMEs. The study certainly has some limitations which need to be acknowledged. For example, the results obtained here are not meant to be generalized to other Mexican enterprises or even to other enterprises in the region where the study took place. We recognize that each enterprise is unique in different respects such as the value attached to IT or the approach to IM used. Similarly, we recognize that knowledge advances at a similar pace to that of our world and is constantly being transformed. Therefore, the results might vary over time, especially in a discipline that is so sensitive to change such as this one.

Nevertheless, the results obtained are very revealing. It was found that even though SMEs are managing information and technology without employing a methodology or in a systemic way, they are making efforts to respond to the market and competition needs. In a similar vein, it was found that even though some of the studied enterprises have achieved an advanced stage in the management and use of information and technology, none of them has validated these ideas empirically or designed an effectiveness measurement to determine if an enterprise is appropriately managing and using information and technologies.

The results enable us to highlight the great impact that Innovation has on organizations' performance. The results also allow us to confirm that the SMEs in general are willing to develop new products and services based on IM and IT in order to survive in this global world in which we now live. This in turn influences the harmonious development of institutions because it enables them to create wealth in the form of jobs, prestige, cash, and thus the activation of the economy in which they are engaged.

Similarly, the results show that IM has little impact as it only affects one out of three constructs. Therefore, it is important to consider that the SMEs need to pay more attention to this aspect as an effective management of it can bring many competitive advantages. On the other hand, as research has demonstrated, IT has a high level of influence on the four constructs which is related in the form of hypotheses. This allows us to conclude that it is paramount to continue investing in this respect if the SMEs are to survive. This, however, contradicts the productivity paradox. We suggest that more research is needed to continue developing a better understanding of this issue.

It is important to stress that IT should precede IM in order for the SME to be able to perform all their activities that enable them to obtain a higher level of competiveness, innovation and productivity. This has fortunately enabled them to obtain higher levels of competitiveness, innovation and productivity mainly in relation to better and faster decision making processes, and the generation of new market segments and counter competition. These are important factors that every type of institution, regardless of its size, should not overlook. A culture of an efficient management of data and information should be created since, as the data presented showed some hypotheses' rejection, when customers' needs are not appropriately satisfied and the financial performance is not supported may constitute a factor that will negatively affect the survival of businesses. The studied SMEs appear to be missing opportunities that a good information management provides such as the identification of new market niches, the adoption of the most promising events, and the adaptation to the new innovation and competitiveness circumstances in the market.

We conclude by stating that the consideration of information as a product can be observed in several aspects: As a created product used inside an organization, as a product of corporate information, and as a product that flows from the environment to the organization. This will basically depend on the given context and the purpose of the use of such information.

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