

Success Factors of Information and Communication Technologies in Business Management: A Systematic Review of Literature

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Abstract

This study presents an analysis, using a literature review, for which 52 published articles on the influence of information and communication technologies on business management were analyzed. To be competitive in the workplace, companies need information about the information and communication technologies applied in business management. The present study resulted in the following factors: Greater competitive advantage, software (software) for communication in all areas and support in decision making.

Keywords: Review, competitive, computer programs, decision making, competitive advantage.

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INTRODUCTION

The contemporary phenomenon of information and communications technology (ICT) produces profound changes in societies within the economic, political and social spheres of the beginning of the century, with more relevance in nations with greater economic and technological development than in those with less degree. The current international development of the use and economic application of ICT has led to raise a series of concepts in the social results of the use of this technology [1]. Ávila [2] mentions that the implementation of Information and Communication Technologies (TIC'S) since the end of the last century produced, on a global scale, important changes in all areas, be it private or public, from the form of personal and institutional organization up to the process of communication, of coexistence and learning and, therefore, in the workplace. The use of these technologies begins to mass in large economies, more specifically, in business, around the decade of the fifties. However, it is from the nineties onwards that an important point of academic debate begins on whether a greater investment in TIC'S implies an increase in organizational performance [3]. Domínguez [4] mentions that the new information and communication technologies that we could operationally define as systems and resources for the elaboration, storage and digitalized dissemination of information, based on the use of information technology, are causing profound changes and transformations of social and cultural

nature, as well as economic. Cejas & Picorel [5] mention that the social impact of new technologies is so powerful that it is said that we are entering a new period or stage of human civilization: the so-called information and knowledge society. Saavedra & Tapia [6] mention that nowadays it is impossible to conceive a successful company without the support of information and communication technologies (TIC'S) to manage their business processes.

BACKGROUND

Information and Communication Technologies

In general terms, it can be said that the new information and communication technologies are those that revolve around three basic media: information technology, microelectronics and telecommunications; but they revolve, not only in an isolated way, but what is more significant in an interactive and interconnected way, which allows to achieve new communicative realities [7]. Alemna & Sam [8] mention that information and communication technologies (ICT) are electronic means of capture, processing, storage and dissemination of data and information, facilitate the design of organizational strategies. According to Hernández *et al.*, [9] mention that information and communication technologies are one of the main elements that can lead companies to innovation and competitiveness; Shin [10] points out that ICT is a strategic resource for companies to find new opportunities in the market, with low costs and high

probability of success. Bakos & Treacy [11] identified that ICT leads to an increase in results and an improvement in cooperation with customers and suppliers, as well as in product innovation. Scheel & Rivera [12] mention that for ICTs to be a differentiating enabler of organizations, it is necessary to concentrate their use on the key business competencies of companies and articulate them in conjunction with the external conditions of their regional environments. García [13] mentions that in this context, information and communication technologies are a key element since they entail the creation and transmission of knowledge, which favors the development of intangible assets in organizations. The technologies have represented quite important economic investments, not only in their development per se, but in their implementation, use and adoption in organizations. These can be used throughout the supply chain and in any commercial function, not limited to a specific area, that is, from the search for information in the market, procurement, to payments and after-sales service [14]. Gálvez [15] mentions that the implementation of tools and practices associated with ICT positively influences their different forms of innovation. Monllau & Rodríguez [16] mention that the application of ICT can increase efficiency and efficiency in the development of internships. Oliveros & Martínez [17] point out that the use of ICT facilitates management and improves competitiveness, given that it allows hotels to respond more effectively to their customers and offer services more quickly, which leads to an improvement in the quality of the service provided and in the satisfaction of the client.

Web 2.0 in Business Management

The results of a relatively large number of studies and analyzes of WEB 2.0 coincide in defining it as a set of tools that promote online participation, in terms of content creation and social participation [18]. Cronin [19] mentions that web 2.0 is characterized by the ability of people to collaborate and exchange information online. Web 2.0 differs from other traditional tools due to its adaptability to the business environment and its rapid response to the changing needs of organizations [20]. On the other hand Alamdari & Mason [21] mention that the Web has become one of the means of Communication with greater attention on the part of the companies that are sent to the conquest of the same one not only as a means of income generation, but as a source for the dissemination of information and communication. Linderman & Valcárcel [22] mention that Web 2.0 has an inherent potential for solving common problems and for the emergence of shared creativity.

Previous Studies

Urueña *et al.*, [23] conducted a study whose main objective was to develop the learning experience of Information and Communication Technologies (ICTs), applied to students of the Department of

Information Technology of the University Institute of Technology "Dr. Federico Rivero Palacio", Caracas-Venezuela, in Web 2.0 scenarios. The learning environment was designed and developed integrating various technological platforms and Web 2.0 tools, used to produce the content and develop the activities of the ICT course. Among the results of the application of the strategies and learning activities of the ICTs, it was evidenced that e-students manage to integrate different Web 2.0 tools to build novel contents, show little habit to make references of consulted works and demonstrate a high degree of commitment and responsibility in the fulfillment of the individual activities assigned in the network. Castañeda [24] conducted an investigation of the MIF ICT Cluster demonstrating, in almost ten years of activity and 50 projects financed and executed, that business models can be renewed or strengthened or the operation of entire value chains through proper use and intelligent ICTs. Botello, Pedraza & Contreras [25] developed a research whose specific results were that those service companies that adopt ICT in Colombia have an indicator of sales per worker of 4.3% above the same average indicator of the companies analyzed, validating the importance of this type of tools for the performance of organizations today. Gálvez [15] conducted a research that shows the results of a research carried out in Colombia to empirically determine the impact on innovation of micro, small, and medium enterprises (MiPyME) has the use of information and communication technologies (ICT) 'S). The descriptive results show that the degree of use of ICTs in Colombian SMEs is barely acceptable, and the correlations obtained through multiple linear regressions that the use of ICTs positively influences the types of innovation analyzed, except for the Productive processes. Secretary General of ALADI [26] conducted a study on the current and potential use of information and communication technologies in the business sector of the member countries of ALADI. Likewise, the work intends to serve as a base to carry out more in-depth studies that involve, for example, field work for the collection of primary information, analysis and evaluation of public policies applied in each country to encourage the use of new technologies of information, comparative studies of successful cases, among others. Demuner, Nava & Gómez [27] conducted an investigation whose objective was to identify the use that small and medium Mexican companies make with information and communication technologies. The results reveal that Mexican companies, especially SMEs, reflect an improvement in the adoption of ICT, however, their inclination for the use of basic ICT, the PC, the Internet, and e-mail is notorious. Maldonado, Martínez, García, Aguilera & González [28] conducted research on the influence of ICTs on the performance of SMEs in Aguascalientes. The result was that ICTs represent a great opportunity for companies, especially SMEs, to improve their level of competitiveness. Barragán & Vela [29] conducted a study whose objective was to know how Information

and Communication Technologies (ICTs) influence the management of global businesses. A review of literature on background, state of the art, and its trends was made. They concluded that definitely, the economic environment, technological progress and changes in international trade policies force global companies to achieve and maintain a competitive advantage that is increasingly difficult to maintain. Volpentesta [30] in his article mentions that the irruption of ICT as a transforming phenomenon of the life of human societies in general and of man in particular is irrefutable and irreversible. The impact that they especially generate in the companies provokes in them profound changes in their structures and in the work of those who are their members. Ávila [2] in his study tries to demonstrate empirically, using the focus of the State Functionality Index for Mexico, how the use of technologies contributes to the development of New Public

Management, where it can be verified that knowledge is no longer the value principal and is conditioned to a dominant value: innovation.

MATERIAL AND METHODS

The literature review was used, since the author Beltrán [31] mentions that it is an integrative, observational, retrospective, secondary study, in which studies that examine the same question are combined. Roussos [32] mentions that it is a meta-analytical study that combines the results from different studies with a common theme. It is defined as a systematic review in which the results of several studies that examine the same question are combined [33].

The phases of a meta-analysis study are as follows [34-36]:

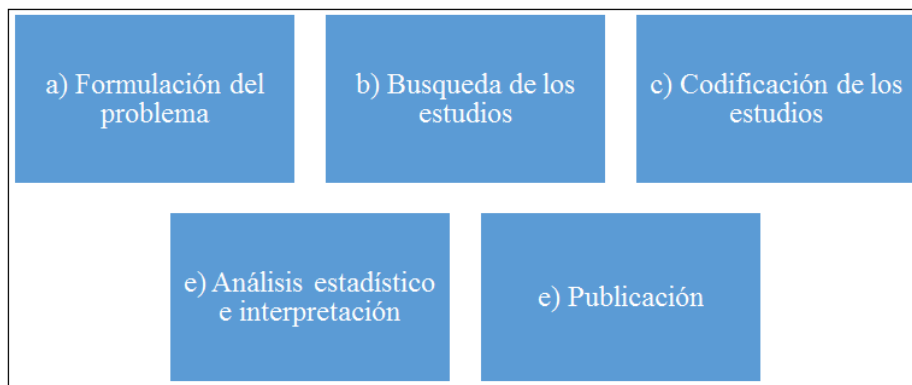


Fig-1: Steps of the methodology used
Source: (Own Conceptualization, 2018)

Formulation of the problem. In this phase we worked on the project approach. To do this, the topic was studied and the topic justified. Figure 2 shows an

example of the meetings that were held with professionals on the subject.

SEP SECRETARÍA DE EDUCACIÓN PÚBLICA		TECNOLÓGICO NACIONAL DE MÉXICO	
Profesor: Carlos Salazar	Institución Educativa: Instituto Tecnológico M.B.	Asignatura: Proyecto de Investigación	
Nombre del Proyecto: Gestión Empresarial en un mundo globalizado		Tiempo/ Cantidad de Sesiones	
Objetivo de la Reunión: Revisar el marco teórico.		1	1 hora
		2	
		3	
		4	
		5	
		6	
Recursos TIC: Computadora ☒ Cálculo ☐ Pizarra ☐ Plumones ☐ Impresora ☐ Material de papelería ☐ Impresiones ☒ Otros ☐			
Temas Tratados		Acuerdos	
1. Revisión de meta-análisis		1.3 artículos de metodología de meta-análisis	
2. Revisión de la estructura		2. y 3 artículos de temas con aplicación	
3. Jerarquizar los temas.		3. de meta-análisis	
4. Modificar el formato para que sea igual		4. Corrección del marco teórico Viernes 16	
5. Modificar el formato para que sea igual		5. de Noviembre a la 1:00pm	
6.		6.	
Reflexión Final (cierre):			
Nombre del Asistente		Firma	
Carlos Enrique Salazar Delgado			
Marcos Miguel Claudia E.			
Inclan Contreras Erick Geovanny			

Fig-2: Example of meeting minutes
Source: (Own Conceptualization, 2018).

Search of studies. Once the question is posed, one can proceed to locate and gather the sources of evidence. This is usually the most tedious phase,

especially if there is abundant research on the question raised. Figure-3 shows an example of the meetings that were held with professionals on the subject.

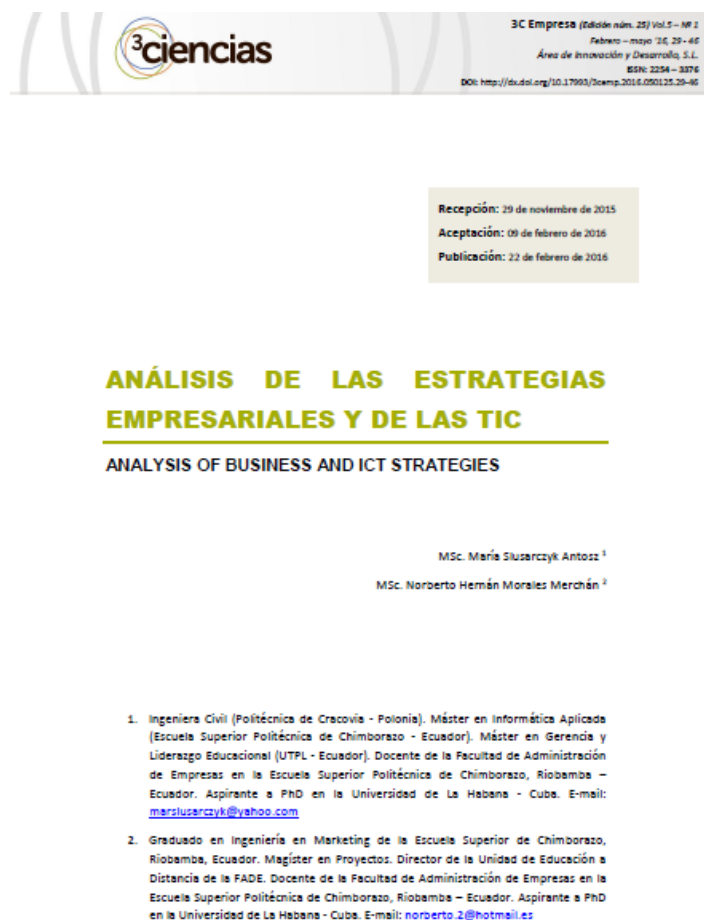


Fig-3: Example of research portals used

Source: (3Cencias, 2016)

Coding of the studies. For the classification of the articles a table will be elaborated considering that all the articles that comply with 75% or more are valid

to elaborate a research article. Table-1 shows an example of the meetings that were held with professionals on the subject.

Table-1: Classification of articles.

Clasificación de los artículos													
Registro	Preguntas												
	1	2	3	4	5	6	7	8	9	10	11	12	13
1. Hernández B., Jiménez J. y Martín M.	4	3	4	4	4	4	3	4	4	4	1	4	4
2. Slusarczyk M. y Hernán N.	4	2	3	2	4	3	3	3	4	3	1	4	4
3. Sandí J. y Brenes C.	4	3	1	2	2	1	2	2	1	2	2	2	2
4. Capeáns C. y Rodríguez R.	4	4	4	3	4	3	4	4	3	4	2	4	4
5. Díaz L.	4	3	4	4	3	4	3	2	3	3	0	2	3
6. Medina j., de la Garza M. y Jiménez Karla	4	4	4	4	4	4	4	2	4	4	4	4	4
7. Lorena M., José W. y Silvia H.	4	2	2	3	3	1	3	4	3	1	1	4	4
8. Hernández B., Jiménez J. y Martín M.	4	3	4	4	4	3	4	4	4	4	3	3	4
9. Galo E.	4	3	4	4	4	1	4	4	4	4	1	4	4
10. Paredes A.	4	3	2	4	3	3	3	2	4	3	1	3	4

Source: (Own Conceptualization, 2018)

Taking into account the results, the articles valid for this investigation are in total 36 since they meet a grade of 75% or more.

Statistical analysis and interpretation. In this section an analysis was made where the decision was made about which articles go to the next round. Table-2

shows an example of the meetings that were held with professionals on the subject.

Table-2: Classification of articles

Registro	Puntaje total	Promedio	Calificación %	Pasa a la siguiente evaluación
				SI/NO
1. Hernández B., Jiménez J. y Martín M.	47	3	90%	SI
2. Slusarczyk M. y Hernán N.	40	3	77%	SI
3. Sandí J. y Brenes C.	26	2	50%	NO
4. Capeáns C. y Rodríguez R.	47	3	90%	SI
5. Díaz L.	38	3	73%	NO
6. Medina j., de la Garza M. y Jiménez Karla	50	3	96%	SI
7. Lorena M., José W. y Silvia H.	35	2	67%	NO
8. Hernández B., Jiménez J. y Martín M.	48	3	92%	SI
9. Galo E.	45	3	87%	SI
10. Paredes A.	39	3	75%	SI

Source: (Own Conceptualization, 2018)

Publication. In this phase, all the work carried out throughout the investigation was integrated into a document in order to leave evidence and evidence is useful for future work.

RESULTS AND DISCUSSION

In order to have a more concrete idea of the subject, a table with the main ideas of the authors with the valid articles will be elaborated, reviewing to what results they arrived. Table-3 shows an example of the meetings that were held with professionals on the subject.

Table-3: Comparison of ideas by the authors

Autor	Nombre del artículos	Idea
Hernández B., Jiménez J. y Martín M	Aceptación empresarial de las tecnologías de la información y de la comunicación: un análisis del sector servicios	Las TIC'S valoran en mayor medida la utilidad adquirida, Así, las empresas apoyan sus decisiones en la eficiencia que esperan alcanzar tras el uso de las tecnologías, incrementando finalmente la intensidad de uso. Las implicaciones estratégicas de este trabajo se centran en la importancia que adquiere la valoración de la utilidad y facilidad en la intensidad de uso de las TIC por parte de las empresas. Así, en el caso de que una aplicación sea considerada eficaz para la actividad y además sea sencilla de utilizar, la compañía tomará la decisión de implantarla, difundiendo su utilización a través de todos los departamentos.
Slusarczyk M. y Hernán N.	Análisis de las estrategias empresariales y de las TIC'S	En la definición de la estrategia de una empresa deben participar las personas de todos los niveles de la organización y los profesionales cercanos a las Nuevas Tecnologías (TIC'S)
Capeáns C. y Rodríguez R.	Compatibilidad tecnológica en el despliegue de sistemas de gestión empresarial	El estudio realizado, así como la revisión de los principales elementos relativos a despliegue de SGE (sistema de gestión empresarial), ITI (infraestructura tecnológica informática) y compatibilidad tecnológica, permitió identificar un conjunto de indicadores que abarcan los elementos de software, hardware y servicios que en conjunto dan soporte a las aplicaciones informáticas de una organización.

Source: (Own Conceptualization, 2018)

According to the ideas proposed by the authors, a table will be drawn up, relating the main ideas that meet the main objective of knowing the

influence of ICTs in business management, where the authors who reached the same results will be related.

Table-4: Analysis of ideas by the authors

Influencia	Authors
Mayor ventaja competitiva	1. Medina J., de la Garza M. y Jiménez Karla 2. Hernández B., Jiménez J. y Martín M 3. Galo E. 4. Paredes A. 5. García M. 6. Agudelo E., Niebles L. y Gallón L 7. Maldonado G., Martínez M. y García D. 8. Primera C., García L. y Romero D. 9. Silva R. 10. Rodríguez M. y Peña J.
Programas informáticos (software) para comunicación en todas las áreas	1. Capeáns C. y Rodríguez R. 2. López L. 3. Díaz F. 4. Pérez D y Dressler M. 5. Andrade J. 6. Quispe A., Padilla M. y Telot J.
Apoyo en la toma de decisiones	1. Hernández B., Jiménez J. y Martín M 2. Sosa M. 3. Guillén T. 4. Estrada J. 5. Romero M. y Escalona Y.

Source: (Own Conceptualization, 2018).

With regard to what was analyzed above, it is observed that the indicator of competitive advantage is the greatest influence in business management, since there are 10 authors who reached the same conclusion, therefore, it is given the greatest importance; investment in TIC'S requires a medium to long-term plan, this has to involve all areas of the company; the important thing to generate this competitive advantage is the path taken by companies to reach them, because it is an overly valuable resource whose use must be maximized.

There are also two other influences that are very important for business management and worth emphasizing; the first one is the software (software) for communication in all the areas in which 6 authors concluded that it is important within the company because it renews and promotes processes, as well as giving support to all the activities that are carried out; and the second one is the support in decision-making since there are 5 authors who place it as the main influence in their articles, since it helps managers to make better decisions generating higher productivity, market competition, income, definition strategies and greater competitiveness.

CONCLUSION

The aim of this work was to understand the influence of information and communication technologies on business management, starting from a theoretical framework that ranges from the background of ICTs to the tools used in a company for business management.

Making an exhaustive analysis of research articles I was able to know much more about some

cases where the implementation of ICTs in companies is satisfactory in several aspects, be they economic, social, and cultural, competence and generation of information in all areas.

On the other hand, the results of the main ideas among the 36 articles by different authors, confirm that the influence of ICTs in business management falls on the competitive advantage since by applying this type of technologies in companies it helps to establish the possible changes in the development and acquisition of resources and capacities of the organization, according to its strategy.

Most of the authors (to be exact 10) of the articles that were valid, agree that the greatest influence lies in the competitive advantage because ICTs constitute an effective methodological tool that optimizes resources and promotes better results; but there is also another important coincidence with which 6 authors agree; this refers to computer programs, since there are various programs that facilitate communication between employees, customers, suppliers, area managers and even between companies; an example of this is the CRM which is a program that facilitates communication between several people in a company to reach agreements that benefit the company and its employees.

Finally, but no less important is the idea that it influences the decision-making support with which 5 authors agreed, this is because they are precursors of improvement in the managerial field and in the confrontation with the competition in the most adequate.

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