

# Impact of ICT in the Generation of New Services Companies

**Sileny Estella Cujia Berrio**

Universidad de la Guajira, Riohacha-Colombia

**Remedios Pitre Redondo**

Universidad de la Guajira, Riohacha-Colombia

**Hugo G. Hernández P.**

Universidad del Atlántico, Barranquilla-Colombia

Copyright © 2018 Sileny Estella Cujia Berrio et al. This article is distributed under the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

## Abstract

Information and communication technologies accelerated the pace of globalization and increased the complexity of business practices, due to the need for companies to be familiar with their local context, in addition to constant industrial developments. For this reason, the need to participate in a global market forces companies to adapt quickly to change, placing information and knowledge management in a position where it had not been before. For this reason, the following document proposes the analysis of the impact that technologies have had on entrepreneurship processes, using qualitative research and the bibliographic review technique. The results obtained show that the influence of technology is relevant and therefore the dynamics of entrepreneurship are multiplying at a universal level.

**Keywords:** Information and Communication Technologies (ICT), Entrepreneurship, Trade, Services, Developed Economy

## 1 Introduction

Ortega [1] has highlighted a definition of ICT, which he describes as technological

devices that allow data to be edited, produced, stored, exchanged and transmitted between different information systems that have common protocols; In addition, Alderete (2012) gives a definition to the concept of *connectivity* which goes beyond infrastructure and hardware, including software and skills incorporated in people, governments and entrepreneurs, who end up giving value to these tools, through the way they contribute to productivity. On the other hand, innovation is synonymous with change, in such a way that it allows the company to develop and offer new products or improvements in manufacturing or management processes, so that economic and social changes can be successfully exploited [3]. The notion of services as the key to development becomes the main focus for service innovation; this process is usually motivated by different causes, from the demand of new customers, the creation of new services for existing markets, or the search for new market niches for existing services. Accordingly, Den Hertog recognized four dimensions by which a service innovation can be developed: in the concept of service delivered, in the customer interface, the service delivery system, and the technology [4].

## 2 Methodology

For the analysis of the proposed topic, a qualitative research was developed that applied document review as a data collection tool [5]. For this review, descriptors such as: ICT, entrepreneurship, services, globalization and economic development were used. Also, inclusion criteria were established for the publications to be selected, giving priority to the scientific articles of the last five years, from recognized databases in different languages and with contributions of related research and conclusive postulates that are aligned with the purpose of this research. The results were analyzed, organized and tabulated, grouping the most relevant aspects in the form of tables or graphs to facilitate understanding of them.

## 3 Results

According to Manochehri, Al-Esmail, & Ashrafi [6], ICTs are one of the key ingredients for improving a company's competitiveness. Accordingly, the authors stated that ICT platforms provide four main contributions to organizations: first, they generate greater visibility for business enterprises; second, they provide more information to small businesses; third, they enable businesses to overcome traditional trade barriers; and fourth, they facilitate financial transactions. Investment in ICT infrastructures can be used as a competitive advantage to carry out business through commercial connectivity, software, technology, e-commerce, online transactions, etc.

Alderete & Gutiérrez [2] developed a study in service companies in Colombia, where they studied the contribution of these technologies to productivity, finding that there is a positive relationship between the capital invested in ICT and the computer applications developed, in the labor productivity of this type of organizations.

ICT capital outperforms non-ICT capital in its contribution to productivity by 4%, making it the investment that generates higher productivity after wages per worker. There are different studies that analyze ICT, especially the factors that affect the adoption of ICT, which can be identified in three groups [8]: factors related to the personnel of the company that is going to use ICT; factors related to the characteristics of the company; factors related to the environment in which the company operates.

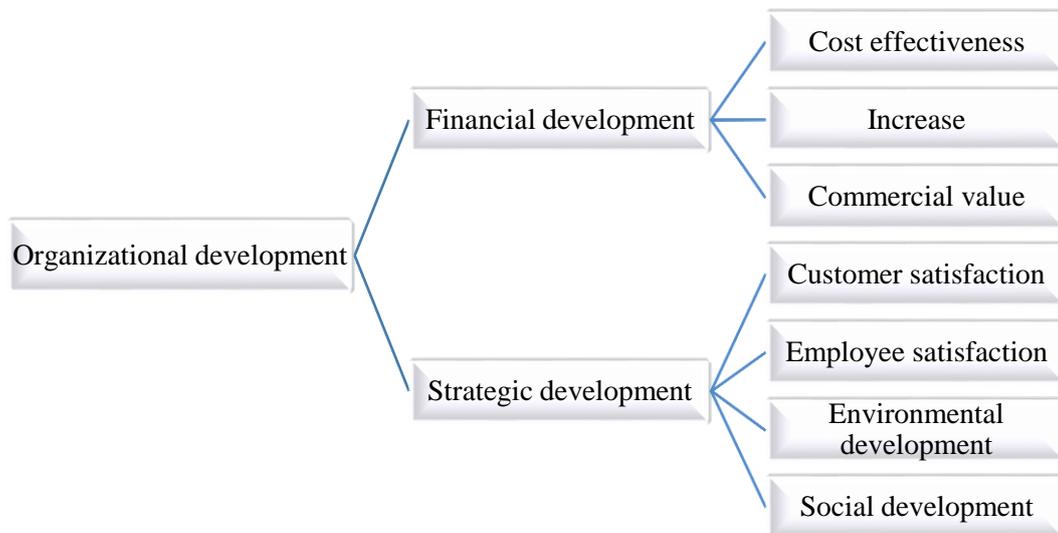
In comparison, Consoli [8] describes the adoption of ICT as a complex process stimulated by the following conditions: business conditions: sensitivity and commitment of senior strategic management; organizational conditions: depending on the presence of an ICT manager, who may be an entrepreneur, manager, employee of the ICT department or external consultant / supplier; management conditions: determined by appropriate leadership by qualified human resources. Similarly, Consoli [8] highlights a series of factors that impact on the adoption of ICT in organizations, which can be detailed according to what the researcher has established: individual factors: consider the commitment of senior management, personality traits, culture in the information system, skills, learning processes; organizational factors: size of the organization, human capital, organizational culture, levels of employee participation; technological factors: existing technological infrastructure and economic factors: macroeconomic costs; environmental factors: pressure from competition, innovation requirements from customers, public policies.

It is worth noting the importance of human capital in the implementation of ICT [9], especially in small and medium enterprises; owners or managers are generally unfamiliar with the concepts related to the use of ICT within their environment, so their openness to these technologies is limited and often ineffective, making enthusiasm a crucial factor in the adoption processes of this type of organization [10]; as well as the lack of knowledge about the benefits and value of its use, becomes its biggest obstacle (Martin, Ciofica, & Cristescu, 2013). In this sense, it is important to create a framework to measure a company's readiness to adopt ICT, so that its implementation involves a development plan that should be aligned with the corporate strategy and internal organizational process, in order to maximize the technological potential [8].

On the other hand, it can be observed that ICTs also influence the flexibility of organizations and companies [11], since those that implement this type of technology tend to perform better in the market and differentiate products or services more easily, etc. Taking these considerations into account, it is possible to discriminate between four categories into which the resulting effects can be classified [7]: development: represented in efficiency, effectiveness and competitiveness; as well as business innovation and intangible benefits; growth: identified in the increase of productivity, sales and strategic growth; expansion: manifested through organizational growth, supply chain improvement, and

international communication; new products: represented by innovation in products or services, quality and customer satisfaction. It was also possible to establish that the improvement in the organization's performance can be classified according to the following figure.

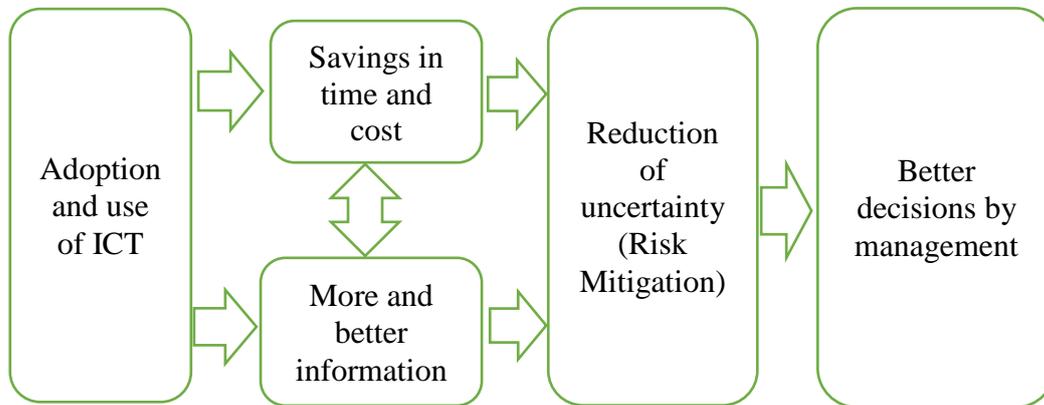
Fig. 1: Dimensions of economic development benefited by ICT (Tarute & Gatautis, 2014)



The dimensions represented in the figure above can be explained as follows [7]: Profitability: return on assets, investment, capital, economic value added; Growth: earnings per share, improved share price, dividend yield, share price volatility, market value added; Commercial value: growth in market share, assets, net income, number of employees, etc.; Customer satisfaction: mix of products and services, number of complaints, repurchase rate, customer retention, overall customer satisfaction, number of new products or services launched; Employee satisfaction: billing, investment in employee development and training, salary and reward policies, career plans, organizational climate, overall employee satisfaction; Environmental development: number of projects aimed at improving and recovering the environment, level of pollutant emissions, use of recyclable materials, level of recycling and reuse of waste, number of environmental claims and Social development: employment of minorities, number of social and cultural projects, number of complaints submitted by employees, clients or regulatory agencies.

Botello, Pedraza & Contreras [12], through an investigation they were able to establish the benefits of the application of ICT in the management processes of the organizations, shown in figure 2.

Fig. 2: Causal relationship of ICT in enterprises (Botello, Pedraza & Contreras, 2015)



This research evaluated the contribution of ICT in 17,000 Colombian companies; after isolating the factors that could have affected their behavior, an increase in sales per employee of 4.3% was found. On the other hand, it was established that the elements that contributed most were e-mail, the Internet in the innovation processes and as a tool for approaching their clients [12]. E-commerce in particular provides small and medium-sized enterprises with market expansion, productivity and innovation, profitability, increased sales and competitiveness [12]. The subject of the use of ICT in organizations has been the subject of numerous investigations around the world, one of those cases is the study of its implementation in logistics services companies, whose applications have generated competitive advantages around communications, cargo management, tracking systems, among others, which are briefly represented below [14].

Table 1: Advantages of the application of ICT in companies in the logistics services sector (Harris, Wang, & Wang, 2015)

<i>Advantage</i>	<i>Benefits</i>
<i>Systems of resource management of load</i>	Improvement of operational efficiency
	Reduction of wasted space due to better route planning
	Improving the use of transport infrastructure
	Improved customer satisfaction
	Cost reduction through vehicle optimization
<i>Information and communication systems with terminals and ports</i>	Reduction in the time of loading and unloading in the terminal
	Improving the use of terminal infrastructure
	Improved and efficient interfaces between different load handling modes
	Reduced operating costs
	Improved customer service and satisfaction

Table 1: (Continued): Advantages of the application of ICT in companies in the logistics services sector (Harris, Wang, & Wang, 2015)

<i>Systems for the tracking and management of goods and fleets</i>	<i>Allows operators to monitor and manage cargo and vehicle with up-to-date information</i>
	Improves customer service through better communication and provision of real-time load information
	Use of improved safety and security procedures
<i>Integrated Information Platform and Operational Exchange</i>	Reduced delivery time, resulting in reduced inventory
	Use of electronic tools throughout the chain to provide tailor-made services, as well as the exchange of information between participants
	Allows related authorities to interact with operators for the exchange of information and documentation

Tan, Razali & Desa [15] summarizes the advantages in three categories: (a) Location tracking: system for determining the location of products delivered to the customer; (b) Product identification: a system for identifying information on goods, using technologies for their recognition, in order to collect number and identifying information on the consignment; (c) Data communication: technologies for accessing and delivering information. The development of ICT has also led to changes in demand and supply, generating consumer expectations of flexible and individualised options, as well as greater quality of shared information on leisure and tourism activities; some of the most significant developments are [16]:

- E-tourism - Demand and technology-driven revolution: tourists have become more demanding, demanding high quality and valuable products, for their money and time; they depend largely on electronic means to obtain information about destinations, as well as to be able to communicate their needs and wishes to suppliers quickly [17].
- Impacts of e-tourism on the marketing mix: ICTs provide opportunities for innovative organisations to redesign tourism products to meet individual needs and consumer desires [18].
- E-Hosting: ICT has penetrated hosting management at an accelerated pace, reshaping marketing, improving overall efficiency, providing tools for market research and partnership building, while enabling improved customer service [19].
- e-tour operators: Tour operators need to constantly interact with all their partners, including accommodation and transport managers, making ICT a key tool for the distribution of tour operator packages [20].
- E-Travel agencies: the integration of ICT in administrative activities such as accounting, commission supervision or personnel management, as well as the use of these tools in the front office for the client, has allowed these actors to achieve significant synergies, efficiencies and cost savings. In addition, the transactions provide valuable market research data, which can almost instantly inform market movements and help you make tactical decisions [15].

## 4 Conclusion

When analyzing the results of the research, it has been possible to specify that the impact that ICTs have been generating to entrepreneurship and productive processes is quite noticeable. Its benefits are appreciated both in economic and quality terms, since benefits are appreciated in terms of profitability as well as customer satisfaction and other stakeholders. Competitive aspects such as cost savings, information management and decision making are among the most important competitive advantages, since in a global economy that requires major developments to meet customer expectations, it is essential to achieve constant progress in this regard. The documentary review carried out makes it possible to recognize the following as the main benefits of ICT for service companies: improvement in daily operation; customer Satisfaction; improvement of risk management; timely decision making; insertion of computer solutions and interaction of the parties of interest.

## References

- [1] C. Ortega, Inclusión de las TIC en la empresa colombiana, *Suma de Negocios*, **5** (2014), 29-33. [https://doi.org/10.1016/s2215-910x\(14\)70006-0](https://doi.org/10.1016/s2215-910x(14)70006-0)
- [2] M. Alderete and L. Gutiérrez, TIC y productividad en las industrias de servicios en Colombia, *Lecturas de Economía*, (2012), 163-188.
- [3] H. G. Hernández, D. A. Cardona and J. L. Del Rio, Direccionamiento Estratégico: Proyección de la Innovación Tecnológica y Gestión Administrativa en las Pequeñas Empresas, *Información Tecnológica*, **28** (2017), no. 5, 15-22. <https://doi.org/10.4067/s0718-07642017000500003>
- [4] M. Barrett, E. Davidson, J. Prabhu and S. Vargo, Service innovation in the digital age: Key contributions and future directions, *Mis Quarterly*, **39** (2015), 135-154. <https://doi.org/10.25300/misq/2015/39:1.03>
- [5] S. J. Taylor, R. Bogdan and M. De Vault, *Introduction to Qualitative Research Methods: A Guidebook and Resource*, Ed. John Wiley & Sons, 2015.
- [6] N. Manochehri, R. Al-Esmail and R. Ashrafi, Examining the impact of information and communication technologies (ICT) on enterprise practices: a preliminary perspective from Qatar, *The Electronic Journal of Information Systems in Developing Countries*, **51** (2012), 1-16. <https://doi.org/10.1002/j.1681-4835.2012.tb00360.x>

- [7] A. Tarute, and R. Gatautis, ICT Impact on SMEs Performance, *Procedia Social and Behavioral Science*, **110** (2014), 1218-1225.  
<https://doi.org/10.1016/j.sbspro.2013.12.968>
- [8] D. Consoli, Literature analysis on determinant factors and the impact of ICT in SMEs, *Procedia Social and Behavioral Sciences*, **62** (2012), 93-97.  
<https://doi.org/10.1016/j.sbspro.2012.09.016>
- [9] R. Pitre, D. Cardona and H. Hernández, Proyección del emprendimiento indígena como mecanismo de competitividad en el postconflicto colombiano, *Revista de Investigación, Desarrollo e Innovación*, **7** (2017), no. 2, 231-240.  
<https://doi.org/10.19053/20278306.v7.n2.2017.6068>
- [10] J. D. Mojica, A. Barandica, L. Rodero, M. Franco, H. Hernández and S. Arboleda, La función administrativa en la era de las TIC, *Revista Lasallista de Investigación*, **12** (2015), no. 2, 139-151. <https://doi.org/10.22507/rli.v12n2a15>
- [11] W. A. Niebles, H. G. Hernández and D. Cardona, Gestión tecnológica del conocimiento: herramienta moderna para la gerencia de instituciones educativas, *Revista de Investigación, Desarrollo e Innovación*, **7** (2016), no. 1, 25-36.  
<https://doi.org/10.19053/20278306.v7.n1.2016.5633>
- [12] H. Botello, A. Pedraza and O. Contreras, Análisis empresarial de la influencia de las TIC en el desempeño de las empresas de servicios en Colombia, *Revista Virtual. Universidad Católica del Norte*, **45** (2015), 3-15.
- [13] V. Sanabria, L. Torres and L. López, Comercio electrónico y nivel de ventas en las MiPyMEs del sector comercio, industria y servicios de Ibagué, *Revista EAN*, **80** (2016), 132-154.
- [14] I. Harris, Y. Wang and H. Wang, ICT in multimodal transport and technological trends: Unleashing potential for the future, *International Journal of Production Economics*, **159** (2015), 88-103.  
<https://doi.org/10.1016/j.ijpe.2014.09.005>
- [15] M. Tan, R. Razali and M. Desa, Factors Influencing ICT Adoption in Halal Transportations: A Case Study of Malaysian Halal Logistics Service Providers, *International Journal of Computer Science Issues*, **9** (2012), 62-71.

- [16] A. Bethapudi, The role of ICT in tourism industry, *Journal of Applied Economics and Business*, **1** (2013), 67-79.
- [17] C. Akomea-Bonsu, and F. Sampong, The impact of Information and Communication Technologies (ICT) on Small and Medium Scale Enterprises (SMEs) in the Kumasi Metropolis, Ghana, West Africa, *European Journal of Business and Management*, **4** (2012), 152-158.
- [18] F. Martin, L. Ciovica, and M. Cristescu, Implication of Human Capital in the Development of SMEs through the ICT Adoption, *Procedia Economics and Finance*, **6** (2013), 748-753. [https://doi.org/10.1016/s2212-5671\(13\)00198-6](https://doi.org/10.1016/s2212-5671(13)00198-6)
- [19] S. Umair, A. Björklund and E. E. Petersen, Social impact assessment of informal recycling of electronic ICT waste in Pakistan using UNEP SETAC guidelines, *Resources, Conservation and Recycling*, **95** (2015), 46-57. <https://doi.org/10.1016/j.resconrec.2014.11.008>
- [20] S. Gërguri-Rashiti, V. Ramadani, H. Abazi-Alili, L.P. Dana and V. Ratten, ICT, innovation and firm performance: the transition economies context, *Thunderbird International Business Review*, **59** (2017), no. 1, 93-102. <https://doi.org/10.1002/tie.21772>

**Received: June 20, 2018; Published: July 16, 2018**