



Key enablers: measuring digital transformation in companies located in ocaña norte de santander



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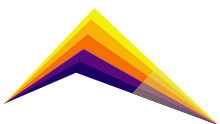
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Abstract

Today, it is essential to improve enterprise architecture based on a clear and precise vision of business objectives. The structuring of new architectural components must be based on a holistic approach, determining in principle the current state of an organization and thus detailing a coherent and organized system among all its elements. The incorporation of new information and communication technologies (ICT) requires a methodological accompaniment that allows the execution and control of digital transformation actions in the business context; in this sense, researchers have focused their efforts on knowing the appropriate model to implement and generate new configurations in organizations from the development of new technologies that are transforming the ways of doing business, supported by the provision of services that are supported by information technologies (IT). During the studies, through a systematic review, the researchers were able to analyze information that allowed them to know the current status (use and implementation of IT) of some companies located in Ocaña Norte de Santander; through the development of the thesis, they deduced the requirement to transform or adapt organizational processes based on key enablers for the realization of significant changes in the ICT environments, in addition, these measurements were elementary for the approach of important strategies for the improvement of



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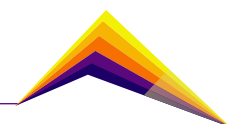


business capabilities in the region, looking for organizations to orient their services through the implementation of emerging technologies that improve their marketing conditions.

Keywords: Digital transformation, Information technologies, Enablers, Connectivity, Big data.

Introduction

Nowadays, the implementation of information technologies offers different opportunities to companies, but at the same time these organizations have differentiated use the acquisition and use of this type of technology [2]; On the other hand, another study refers to digital transformation as a trending topic that concerns commercial, management, and operating companies, determining in its analysis that companies in the financial sector have had a successful takeoff through this practice, to which other sectors such as retail, industry and even mining have adhered [8]. Under the dynamics of a practical environment, the digital transformation promotes a series of benefits to small developing companies, analysts suggest that PYMES must adopt this process to keep up in a global market, and several companies reflect the need to migrate to new technologies to consolidate more efficient business processes and it is emphasized that this work could be somewhat intimidating for this type of companies [6]. According to some studies, digital transformation emerges as a relevant topic for both the scientific and the business communities; in organizations the technologies adhered to these transformations are increasingly generating greater efficiency along the entire value chain, at every moment it is more necessary to customize the user experience about the hyper-connectivity environment, being that organizational changes at the digital level relate multiple edges where the systematization of knowledge is a crucial activity for the entire transformation process [3]. In times of the COVID-19 pandemic, human beings faced new challenges, being information technologies essential for the development of activities in a changing way, during this period people learned the importance of being related between different sectors, and aspects such as self-management and training were essential to deal with the situation at the time, the technologies that helped to connect society were fundamental resources of interaction [7]; The COVID 19 pandemic generated a series of needs in international trade, and logistics processes were affected to such an extent that it triggered an accelerated logistics digitalization; CEPAL promoted transformation policies among different Latin American countries in order to configure logistics processes, strengthening interoperability and reinforcing the integration of technological solutions, based on collaborative schemes [10]. Other research contributions show that one of the benefits of digital transformation can be the improvement of the quality of life of people, as



well as the promotion of critical industries for the development of a country, for this reason, it is essential to move from rhetoric to the implementation of plans that guide the necessary projects for continuous improvement [9]. On the other hand, a study conducted on Chilean companies, reveals that despite implementing new software for the administration and operation of processes in areas of people management, these companies have made little progress in the use of new emerging technologies, in addition, the needs of cultural and socio-emotional change that workers must face due to the processes of digital transformation, aligned to new orientations of service delivery, based on technologies based on artificial intelligence, Big data, and analysis methodologies [5].

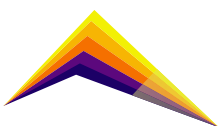
Methodology

During the research and under a quantitative approach, the researchers used the descriptive methodology, supported by the method of analysis, seeking to understand the object of study, analyzing and indicating its main characteristics and properties [4]. In the process, a roadmap was drawn up in line with the stages proposed by PMBOK, which generated the following milestones: 1 Start: Pre-feasibility studies were conducted to understand the problems that the project would address and its feasibility; 2 Planning: The objectives to be achieved, the schedule, budget, among others, were set; 3 Execution: Tasks were carried out to specify the critical enablers for digital transformation, for this it was essential to recognize the appropriation of information and communications technologies in companies of the context (approximately 2500 companies according to data source provided by the chamber of commerce of Ocaña, of which 34 were studied), in addition, researchers consulted 21 experts in computer science on enablers of digital transformation; 4 Monitoring and control: a partial report that evidenced the measurement of the achievements; 5. Closing: Final acceptance under the confirmation of the research and extension division based on the validation of the deliverables that certify the fulfillment of the objectives.

Results and analysis

Use and implementation of technologies

Currently, there is a wide variety of new IT products on the market that support digital transformation processes; Some researchers recommend a framework to carry out these change processes and not only have a technical perspective; Currently, organizations must provide services 24 hours a day, 7 days a week throughout the year, where activities must be planned from a methodology that helps guide the strategy [1]. Below are some deductions about the use and implementation of ICT in Ocaña Norte de Santander:



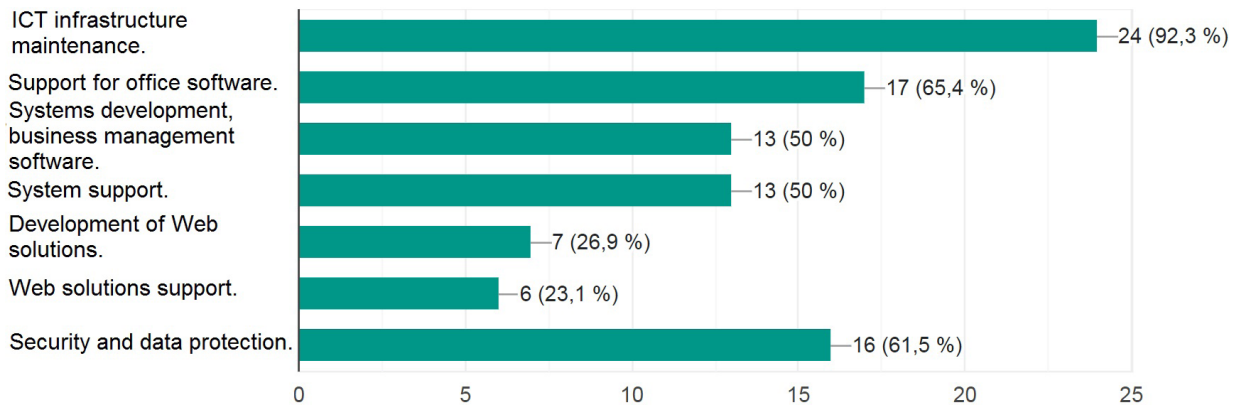


Figure 1. ICT support or implementation activities

Figure 1 shows a low percentage of 23.1% for companies that support web and e-commerce solutions, and 26.9% indicate that they do not develop this type of technology; a high and satisfactory 92.3% is also reflected for companies that perform infrastructure maintenance.

Digital transformation enablers

As mentioned above, digital transformation is a relevant dynamic for continuous improvement in the business context, so it is important to investigate which are the key enablers that could be significant for companies located in Ocaña Norte de Santander; according to [11] “enablers are transversal elements that facilitate and accelerate digital transformation in an organization since they allow transforming the business by aligning technology with the business strategy”; during data collection, for the researchers, it was essential to know the perceptions of different IT experts about digital transformation enablers, for which a sample of 21 individuals was extracted who selected a range of enablers classified into three categories. The first, technological enablers, i.e., current technologies needed to develop digital transformation processes are taught below:

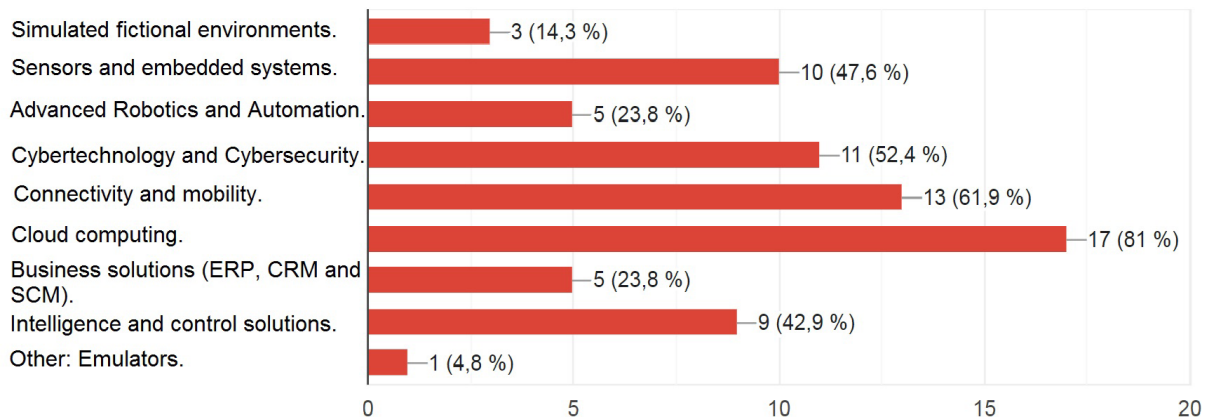
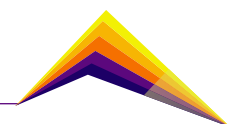


Figure 2. Technological enablers



As shown in Figure 2, 81% of IT experts agreed that one of the most necessary technologies for digital transformation is Cloud computing, followed by technologies related to Connectivity and mobility with a percentage of 61.9%, close to the average percentage we find technologies such as sensors and embedded systems and others such as cyber technology and cybersecurity, with a much lower selection and located at the bottom of the list we find technologies such as Emulators. The second classification is called conceptually based enablers, i.e., current concepts necessary to develop the transformation processes:

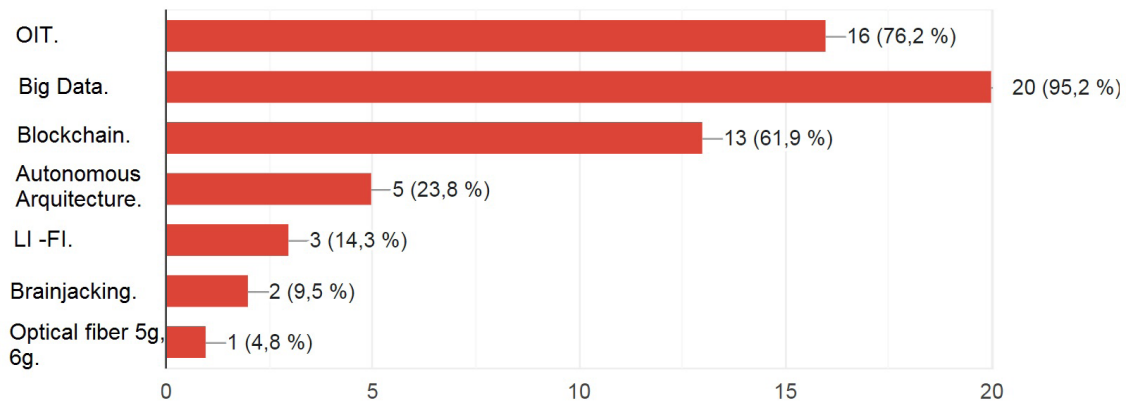


Figure 3. Conceptual basis enablers

As shown in Figure 3, 95.2% of IT experts agreed that the conceptual basis for digital transformation is based on the concepts of Big data, followed by IoT with 76.2%; another conceptual basis that exceeds the percentage average with 61.9% is Blockchain, in the last of Figure 7 we find Fiber optics, 5g, and 6g, of which the researchers consider an erroneous perception by one of the computer experts because it would be classified in the previous categorization, i.e., it would be part of the technological enablers specifically those of Connectivity and mobility. The third classification, strategic enablers, i.e., strategies necessary to develop digital transformation processes, is shown below:

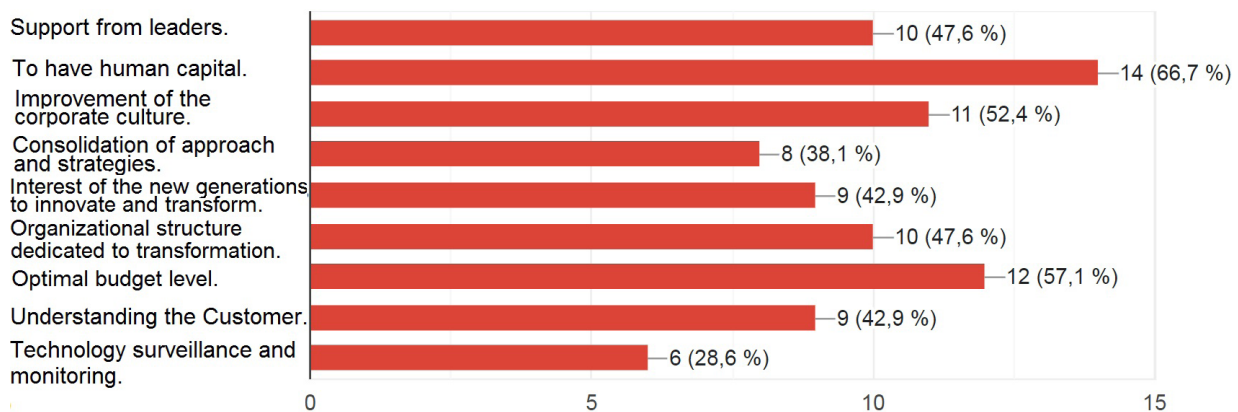
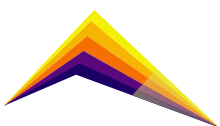


Figure 4: Strategic base enablers

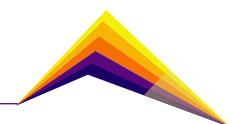


As shown in Figure 4, 66.7% of IT experts agree that one of the relevant enabling strategies for transformation is to have human capital, followed by the optimal budget level with 57.1% and above average with 52.4% to improve corporate culture; at the end of the list is surveillance and monitoring of technology with a value of 28.6%; at a general level, Figure 4 shows a balance in the selections, in general, it is observed that all strategies could be valid for digital transformation processes according to the experts' perspectives.

Conclusions or summary

The results obtained in the course of this research, show different perceptions of thesis authors, people who work in business environments located in Ocaña, and experts in information technologies, it is deduced an orientation by those involved towards the structuring of new strategies to execute real processes of digital transformation; to perform these changing processes it is not enough to acquire traditional transactional systems, rather the proposal must be more dynamic and go far beyond, towards predictive intelligent systems that help decision making and that are simulators of agile environments. From the diversity of technologies that are available in the current market, it is necessary to select

The most appropriate for the context, it is necessary to choose those technologies that generate competitive advantages for the wholesale and retail trade that is developed in the context of the research; on the other hand, the studies showed significant data that indicate the backwardness in companies located in this region, which reduces the availability of services in these organizations, for which it is advisable the orientation towards key enablers, which allow activating coherently and safely the transition processes. Taking into account the information collected and analyzed about the business environments that are developed in the municipality of Ocaña Norte de Santander, the researchers conclude in the first instance that these environments are somewhat behind in actions that promote digital transformation, they also deduce the lack of knowledge in relation to the technologies that do promote digital transformation, They state that just building a website or promoting their products and services through social networks is not digital transformation, the issue must go further and it is necessary to have human capital specialized in the development of intelligent, secure and versatile ICT, as well as to propose strategies to guide aspects of change towards a true and safe digital transformation.



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