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Digital transformation is not just about technology

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Until recently, "digital transformation" was just another jargon used in the technological environment to indicate that companies would, at some point, need to re-adjust to meet the new market requirements. Nowadays, it is believed that the companies' readjustment needs have no longer been associated with the question "when to undertake it?" but instead are associated with the question "how to undertake it" [1] [2].

On the Internet, there is no shortage of websites and experts indicating which are the leading technologies that should be adopted by companies in their future digital transformation projects [3] [4] [5]. IoT, data analytics, cloud computing, 5G communication, blockchain, artificial intelligence, machine learning, augmented reality, and 3D printing is some of the recommended technologies. However, although these technologies are being used successfully by some companies, their employment must be done according to the real need of each company rather than just for a fad.

> There is no way for companies to consider digital transformation without considering their internal aspects (purpose, structure, and operation) in a manner disassociated with external aspects to them (society, business, and government).

Digital transformation is a subject that must be approached by companies not only from the technological point of view but also from the sociotechnical point of view, i.e., in a way that takes into account not only the technology but also the people who use them, and their resulting interaction upon society [6].

Important Definitions

But what is "digital transformation"? For some researchers, digital transformation addresses the adoption of disruptive technologies to increase productivity, value creation, and social well-being [7]. For others, digital transformation involves the use of new technologies for extracting and exchanging data so that they can be analyzed and transformed into useful information for decision making aimed at increasing the company performance to improve its business models, processes, products, and customer relationships [8].

There are also researchers who claim that digital transformation is a type of organizational transformation that occurs within the companies focusing on the use of information technologies to change structures, routines, information flows and the company operations taking into account that this transformation also is subjected to the influence of external factors coming from governmental agencies [9].

According to a study carried out in CEST by researchers Simonette, Magalhães and Spina (2019) [10], digital transformation is a process involving the use of technological resources (mainly related to digitization, storage, search and communication of information) to rethink three fundamental pillars of a company: the Purpose (intention, reason or motivation for its existence); the Organizational Structure (way in which the division of the company's activities and resources are organized in a way so that the company's objectives are reached); and the Operation (activities developed by several sectors of the company that contribute to its operation). If a company's technological readjustments are focused on dealing with only one of these three pillars, it is possible

that the company is conducting only a modernization process with specific objectives, but not a more in-depth readjustment process aiming at a digital transformation.

Influential factors on digital transformation

The companies' fundamental pillars form a triad and, as in any triad, it is not possible to privilege one of its elements without underprivileging the others. According to the CEST researchers, there are at least three ways for a company to approach digital transformation considering two fundamental pillars at a time:

- Purpose of the Company + Organizational Structure (visionary-bureaucratic approach): It is the case of companies that choose to adopt innovative ideas or disruptive business models having organizational structures that support these business models, but that eventually have unsatisfactory operational processes.
- Purpose of the Company + Operation (liberal visionary approach): This is the case of companies that choose to adopt innovative ideas or disruptive business models presenting effective operational processes, but which may present problems in case of a sudden increase in demand because they do not have a structure which supports proportional growth according to its needs.
- Organizational Structure + Operation (pragmatic execution approach): This is the case of companies with effective operational structures and processes, but that may not stand out as innovative companies because they are only modernizing old ideas.

> It is possible that the company finds that their business rules, processes, models, and systems may be working well and that they do not need to be changed given the costs, time, effort, and risks that a project such as this would require.

Companies need to choose wisely which types of pillars they wish to support before planning their digital transformation because depending on the type of business model they have, on their internal structure, and their technical operational capability, the company's behavior, and dynamics might be affected by wrong choices. According to a study held by McKinsey in 2013 [11], 70% of companies failed to perform their digital transformation and the 30% that reported success mentioned that the key factor for success was a clear scope on what needed to be changed.

However, it should not be forgotten that another triad has an external influence in the digital transformation processes of a company, the triad: business (the product or service which the company hopes to produce or provide in an innovative or traditional way for its target audience); society (part of the population that will be impacted by the product or service produced or provided by the company); and government (which, in this case, can be represented by any governmental entity that has some regulatory power over a company's business activities).

Through this triad, it is possible to analyze the external influences over the digital transformation processes of companies also considering two pairs of the triad at a time:

- Society + Business (activities without regulation): Situation in which many startups have ideas or business models that are innovative to society but that do not yet have the support of laws or regulations that allows them to operate without obstacles. These young companies, especially at the beginning of their operations, choose this type of activity despite living in conflict with regulators, trade unions, and certain parts of society [12].
- Company + Government (business in check): Situation in which certain startups have innovative ideas or business models for society that also do not have the support of laws or regulations that allows them to operate, but which choose to wait for the regulatory obstacles resolution before starting their operations. This is a situation that delays innovation [13] and, for this reason, many startups end up choosing the first presented option.
- Business + Government: (activities with regulation): In this situation, it is the society that ends up becoming a

bureaucracy's and regulation's "hostage", because the regulatory process may negatively modify a business model with innovative characteristics. As an example, it is possible to mention several regulations related to data privacy in the electronic means that are being created with the involvement of companies and governments; a large part of society has not participated in these discussions (either by choice or lack of knowledge on the subject), and the result could negatively impact the privacy of citizens.

Therefore, there is no way for companies to consider digital transformation without considering their internal aspects (purpose, structure, and operation) in a manner disassociated with external aspects to them (society, business, and government). There are no right or wrong solutions, neither assertive ways of acting, since these six variables may have more or less influence depending on the type of company and the political and economic situation that a country is living. For those reasons, digital transformation has become a field of studies open to research and discussion.

The myths concerning digital transformation

In addition to the internal and external analysis that must be done, it is essential that, first and foremost, companies have pondered the real reasons and the real needs of starting a digital transformation project before concentrating their time and resources on a project that can present high degrees of risk.

Another myth involving digital transformation is that the business sector of the company must be changed before someone else does it.

In an article written for the MIT Sloan School of Management magazine, researcher Steve Andriole, a renowned information technology professional and award-winning researcher at the Defense Advanced Research Projects Agency (DARPA), presents five myths related to digital transformation [14] which must be known to senior managers.

First, it is a fallacy to say that all companies need to make a digital transformation. According to Andriole, the digital transformation must be carried out from a previous study that involves the identification and modeling of the existing processes of the company, because with this material at hand it is possible to identify which points of the company may or may not be digitally transformed. It is possible that the company finds that their business rules, processes, models, and systems may be working well and that they do not need to be changed given the costs, time, effort, and risks that a project such as this would require.

Secondly, digital transformation should not necessarily be conducted using disruptive technologies. This is because many emerging or disruptive technologies have not yet been tested to assertively prove that they will significantly contribute to the company's increased revenue, profit, or market share.

Third, it is common to imagine that profitable companies are the most likely to launch successful digital transformation projects, but the reality is possibly different. According to the researcher, underperforming companies are the most likely to innovate because their survival depends on this, whereas companies that are doing well in the business are already generating wealth for shareholders and therefore have lower tendencies to undertake changes. Business leaders are aware that many changes involving new business models, changes in structure or operations are often time-consuming, inaccurate, and sometimes "painful," not to mention the risk of negative exposure of their images if the initiatives go awry. No wonder there is the saying "if it is not broken do not fix it".

Another myth involving digital transformation is that the business sector of the company must be changed before someone else does it. As mentioned earlier, innovations and disruptions hardly arise from established firms that have consistent and profitable revenue streams. Companies such as Airbnb, Uber and Lyft, Amazon (books and retail) and Netflix (entertainment) have emerged as startups that have made bets on old areas of the industry. According to Andriole, today, while these companies agree on their roles

as innovators, they will hardly become champions of unlikely changes unless they see their profits wane and their shareholders start to complain.

Finally, it is wrong to assume that most executives are hungry for digital transformation since significant and successful changes require not only strong continuous support from senior management but also from top management teams. Persistent, lasting, and unwavering "public" support is critical for many executives to abandon the fears that their positions inside their companies may be threatened by long-term challenges which results may be uncertain.

Final remarks

In recent years, digital transformation has become a concern for companies because of the need to be prepared for new markets, new consumer demands, and new competitors that rise every day.

However, it is vital that companies, especially well-established ones, choose more pragmatic approaches to the paths they intend to take, by firstly analyzing their current business processes and models to see if they indeed need to perform a digital transformation in their business.

Assuming the conclusion is that the transformation needs to be carried out, it is recommended that companies do not forget to analyze the internal and external factors that will have more or less emphasis on their readjustment processes because if they are not carefully taken into consideration they might be one of the causes for the failure of the initiative.

Finally, digital transformation rarely depends on the exclusive use of disruptive technologies. Pragmatical analysis of processes, clear objectives, and an excellent team of professionals consistently supported by the top management are possibly better ingredients for a successful formula than just betting on the new technology of the day.

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