Exponential Organizations and Digital Transformation: Two Sides of The Same Coin

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ABSTRACT

The objective of this paper is to verify if there is a link between start-ups that have characteristics of exponential organizations and if this growth has a connection with the digital transformation. It is a bibliographic research with a field research based on the theoretical framework in order to understand the influence of digital transformations on ExOs. A semi-structured questionnaire was used to investigate the relationship between ExOs and digital transformation, will be applied to founders and co-founders of six start ups of different segments and sizes, their answers analyzed qualitatively, based on the theories of exponential organizations, would have singularity and abundance. After the analysis it is concluded that of the companies studied, which have strong characteristics of exponential organizations, 100% of them use digital business models (software or platforms) and operate with the strong use of digital tools and agile methods.

Keywords: Exponential Organizations, Digital Transformation, Startups, Network Effect

INTRODUCTION

Over the past 30 years, the desire for economies of scale has resulted in an explosion of large globalized corporations, pressure for ever-increasing margins and cost reductions, increased revenues and better financial results. (ISMAIL et al., 2015) However, according to the authors, these changes bring a high cost, since large organizational structures are inversely proportional to the much needed flexibility. Thus, large companies with thousands of employees and large facilities face the great challenge of operating quickly.

According to ulman et al (2015), from the 2010s onwards, there is the emergence of a new organization model, whose agility and impact differs from existing models, called Exponential Organizations.

Exponential Organization (ExO) is one whose impact (or outcome) is disproportionately large - at least ten times greater over 4-5 years - compared to peers due to the use of new organizational technologies that leverage accelerated technologies. (ISMAIL et al., 2015).

According to Diamandis (2015) these organizations follow the concept of the 6Ds of disruption: digitized, disguised, disruptive, dematerialized, demonetized and democratized. According to the author, any technology that becomes digitized enters a period of growth in disguise. This rapid increase causes disruption and, as technology becomes disruptive, it dematerializes, de-demonetizing and democratizing the product or service.

ExOs use fewer physical facilities and fewer employees than traditional organizations, as they are grounded in information technology, dematerializing physical structures and transferring them to the digital universe on demand. They learned to organize around an information-based world. (ISMAIL et al., 2015)

According to Hagel (2012) when comparing the model with linear organizations, it is observed that they are prepared to support these changes only from the outside, rather than deploying them internally ie linear organizations will rarely disrupt their products or services. because they do not have the tools, attitudes or perspectives to do so. In this way, linear organizations will continue to grow and benefit from the so-called "economies of scale", also called "scalable efficiency, a paradigm that guides most linear corporate strategies" (Brown, J .; 2012).

Mentioning the exponential disruption, (Diamandis, P .; 2015), we observe the imminent obsolescence of current models, so there is a pressing need for constant updating on new technologies and organizational capabilities. For Hagel (2012), rapid or disruptive change is a subject of extreme difficulty for large matrix organizations, which tend to react to change as if they were attacks.

Digital Transformation

In 1911 Frederick Taylor launches an important book: Principles of Scientific Management, the product of his observation in the steel industry where he worked. For him, it was not up to the worker to make decisions about his work, but to produce more and better to meet the organization's objectives within the established time

Around 1915 Henry Ford developed and refined the concept of assembly line work by manufacturing his first model: the large-scale, low-cost black Ford Mustache. Ford's work was groundbreaking at the time, within the principles of Scientific Management, organizing tasks in such a way as to require as little willpower and intellectual effort as possible from the workers. In 1916, Henri Fayol's book General and Industrial Administration is published. He later became the founder of the Classical Management Theory. The famous division of the functions of the administrator is his own: planning, organizing, coordinating, commanding and controlling. (FAYOL, H, 1916)

In the United States, in 1943, Peter Drucker, who would later be considered the father of modern management, launches an important book: The Future of Industrial Man, which invites him to undertake a scientific analysis at a large company: General Motors. As a product of this work, studies in business have gained another major publication: Concept of the Corporation, launched in 1946, laying the groundwork for management to become a scientific discipline. Drucker and his studies have made major contributions to management by integrating strategic planning, marketing, and finance for the first time. It also re-signified the figure of the worker, coining the well-known term 'knowledge worker' in the late 1950s. His vision revolutionized managerial thinking that originated in post-war Japan

The great symbol of the devastated Japanese recovery was the auto industry. The main feature of the Japanese administration was the creation of a formal model, comprising techniques and doctrines, with the purpose of managing production processes and, subsequently, the entire company. Toyotismo, a production system developed by Toyota between 1947 and 1975, aimed at increasing efficiency and productivity,

avoiding waste without creating stock, such as waiting time, overproduction, transport bottlenecks, unnecessary inventory, among others. (Magaldi, S., Neto, Jose S., 2018)

Earlier in the 1970s, Intel founder Gordon Moore developed the microprocessor, bringing technology into the business world. From now on, technology gained speed, accelerating growth at a pace never seen before. This invention only began to impact technology, in fact, in the 1980s, in a thesis known as Moore's Law. This theory predicted that the price / performance ratio of computing would double every 18 months (ISMAIL et al, 2015).

Parallel to the technological advances, the technology giants emerged: Microsoft, Oracle, SAP, Apple, spreading and popularizing the use of technology, bringing more information to the world and, consequently, to consumers who were strongly empowered over time.

In the 1990s, the term innovation gains space and strength never seen before. In a constantly changing world, the level of complexity of social change is growing, forcing organizations to constantly innovate in their markets to remain competitive. The concepts described by economist Joseph Schumpeter in 1942 about creative destruction now gain even more space in the present scenario. The author, in his book Capitalism, Socialism and Democracy, describes the process of innovation, where new products destroy companies and old business models and, for him, is the main driving force of sustained long-term economic growth. According to Schumpeter (1942), the process of creative destruction is the essential fact of capitalism, the innovative entrepreneur being its major protagonist (Schumpeter, J., 1942).

From Schumpeter's studies on creative destruction, in 1995 professors Clayton M. Christensen and Joseph L. Bower published the article Disruptive technologies: catching the wave in Harvard Business Review, introducing the concept of disruptive innovation to the technology universe. . It was the beginning of the Digital Age, which we live today.

With the internet, whole businesses could be reinvented, new products and services more widely spread, and new business models emerged. One in particular stands out in this new environment: startups. Through them it was possible to innovate with high scalability. Due to their leaner structure, final product costs could be reduced and experimentation gained momentum in order to satisfy consumers and bring important differentials in order to gain new customers and new markets. (MAGALDI, S., NETO, Jose S., 2018)

In 2006, another important milestone for enterprise management: Amazon, from Jeff Bezos, launches its cloud storage solution, Amazon Web Services (AWS). At this time affordable cloud services have been created for small and midsize businesses. This has led to a significant reduction in data maintenance costs, garnering numerous startups as customers, who now enjoy cloud storage services and can expand their technology and better store their information. (ISMAIL et al, 2015).

In this moment of disruption, many market leaders were extinguished because they did not understand the new scenario that was emerging in that context. A famous case was Eastman Kodak, which did not invest in the digital market (although he invented the digital camera). While bankrupt, Instagram, with only three years in the market and just over ten employees, was bought by Facebook for $ 1 billion.

The table 1 Show the organization market value

Table 1 –Actual size of the organization market

Company	Family	Market Value (in billion USD)
Github	Technology	7.5
Airbnb	Lodging	25.5
Google	Technology	403.07
Netflix	Streaming	41.6

Source: EXPONENTIAL ORGANIZATIONS (2017).

According to Ismail (2015) "What we are seeing today is a new generation of companies expanding and generating value at a pace never seen before in the business world."

In 2016, the book The Fourth Industrial Revolution by Klaus Schwab, founder of the World Economic Forum, is published. In the work, the author states that “the changes are so profound that, from the perspective of the history of humanity, there has never been such a potentially promising or dangerous moment” (SCHWAB, 2016).

Overall, organizations have evolved through the paradigm of a strategy that focuses on gaining high growth at low costs. Naturally, traditional organizations have adopted a method of wealth generation that includes complete mastery of the entire production chain, from sourcing (for example, control during tobacco planting and harvesting to final cigarette production by the tobacco industry). tobacco). All process steps calculated by the organization.

However, with the arrival of the Digital Age, an important break in this model happens: for the supplier, there is the gain of scale through the growth of existing demand. The “network effect” starts to occur as more and more markets can be accessed, enhancing business reach, generating more connections and, consequently, business opportunities. That is, the gain of scale occurs in a new perspective: that of orienting to demand (MAGALDI, 2018)

The aforementioned effect is made possible by social networks, apps, smartphones, wearable technologies, high scalability applications running in the cloud. All of this working together with potential never before seen.

The collaborative system, which is the act of co-creation and participation to form interactive networks, has also become the essence of giant business in many different sectors: another new business model. Airbnb and Waze use collaborative networks. to make your business happen. The former has built an important network of followers (buyers and sellers) generating a valuable universe of data from sharing. As such, it has hosted over 150 million people, with more than 3 million accommodations in 65,000 cities in over 190 countries. And it achieved a market value of $ 30 billion in 2018. (ISMAIL et al, 2015)

Waze follows the same logic. When it was acquired by Google in June 2013 for $ 1.1 billion, it had no infrastructure, no hardware, and fewer than 100 employees. However, it had 50 million users, that is, 50 million informants collaboratively producing and sending traffic information. Another paradigm breakthrough generating a new business model: Instead of investing huge capital in hardware (traffic sensors), its founders opted for the collaborative network generated by the application to capture traffic information, based on the GPS of users' smartphones. (ISMAIL et al, 2015)

These two examples illustrate well two new models, managed from strategically sharing information, substantially increasing the connection with their users (clients), turning them into loyal users of their platforms. The platform model stands out as a strong strategic option for business management, efficiently uniting technology, communication and sharing. (PARKER, G., 2018)

> The value in a platform is not only generated by the monetary exchange between participant and environment owner company. In some situations, the exchange unit may be the consumption of certain content, in others the sharing of some information and so on. The platform's value lies in encouraging interactions, and through it the ecosystem holder will generate monetary value (MAGALDI, 2018, p. 96).

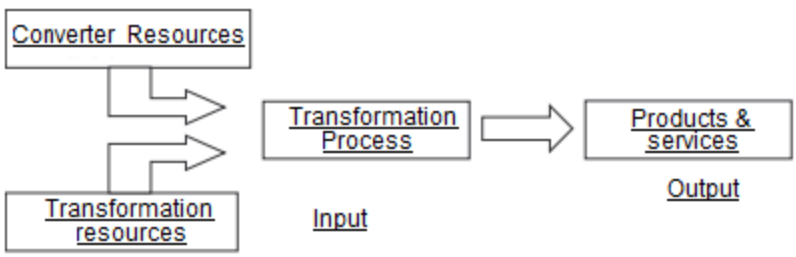
Managers today need to reflect on their business models. Is it focused on cost control or developing demand generation? Do your competitors adopt other models? What would it look like if model developed on a business platform? Is it possible to use the "network effect" to boost your business? Questions of this nature help align the business with new trends and new management models made possible by the advent of technology.

> In the face of all this, one sees how digital technologies are reshaping five key domains of strategy: customers, competition, data, innovation, and value. These five domains describe the digital transformation landscape for today's business. Across these five domains, digital technologies are redefining much of the basics of strategy and changing the rules of how companies must operate in the marketplace to be successful. (RODGERS, David L. (2018). P.20)

Organization Process

According to Peinado and Graeml (2007), the activities in a company result from a succession of events, requirements of the environment in which the company is inserted or resulting from actions of the members of the organization itself. During this succession of events, inputs are received, processed and returned to society in the form of products or services.

For Keen (1997), we can also define organizational process as any recurring work that somehow impacts the organization's capacity point and can be done in different ways with different results and contributions.Figura 1: Modelo genérico de processo organizacional



Source: Peinado e Graeml 2007.p.143

Customer Experience

According to Andrade (2018), customer experience implies their involvement at different levels. According to the author, this experience can be defined as the internal and personal responses of customers to the organization and is created by the contribution not only of customer values but also by the contribution of the company providing the experience, events being experienced by customers prior to purchase and during aftermarket part of this experience.

According to Rodgers (2018), in the Digital Age, we leave a model characterized by mass markets to a customer network model, brought about by the network effect.

But can these strategies used in the largest organizations in the world apply to the management of companies of all sizes? Some Brazilian retail chains have also created new models.

Business Models

According to Rodgers (2018) for organizations to dominate competition in the digital age, business models need to evolve, facing challenges never before encountered that bring new paradigms. And we also need to be clear about the growing importance of strategies for building platforms, not just products.

A traditional and important example of platform business is Uber, which runs a pairing service, which helps passengers find drivers and vice versa. As in the case of Uber, positive network effects are the main source of value generation and hence competitive advantage in a business platform.

The network effect represents a new economic paradigm, totally driven by the technological revolution. Economies of scale in the digital age draw on advances in technology that affect demand (Parker, G. et al., 2018). Social networks, application development, and other actions that use technology to create more value for users are factors that leverage economies of scale from a demand standpoint. These factors have the power to provide the leading company in a network platform marketplace that is important and difficult for competitors to achieve.

Digital transformations Agents

Social Networks

According to Andrade (2018) social media are technologies that aim to facilitate the creation and sharing of information through communities and virtual networks where user profiles are all connected and user generated content is the lifeblood.

According to the author, by interacting with these networks, users can create highly interactive platforms through which individuals, communities and organizations can share, co-create and debate content generated and published by other users, significantly changing the way individuals and large organizations. communicate.

According to Andrade (2018), the corporate social network involves the informal bonds and the bonds of corporate / organizational staff with other people in their field or sector, clients other members of the public, who form through social networks. Corporate social networking can increase operational performance capabilities in a number of ways by enabling sales staff to find new customers; help the marketing team learn about customer needs and demands and teach management about the public perceptions of their strategy or approach.

Cloud Computing

According to Rodgers (2018), cloud computing enables businesses of any size to grow their platform very quickly to bring in more customers. From physical services such as transportation or hosting, and adapting to cloud platform business models, giants like Uber and Airbnb expand exponentially, virtually limitless for growth.

Even if an organization's business model is platform-based, it will reach a very concrete limit to its growth. However, when hosted on the cloud, the platform gains unlimited scalability.

One of the leading exponents of cloud computing, Amazon with its Amazon Web Services (AWS) service, was launched in July 2002, revolutionizing the business world. Ismail et al (2015) states that while there is no official milestone on the emergence of ExOs, it is estimated that the impact of AWS creation may have been an important time. Because affordable cloud services have been created for businesses, which has led to a significant reduction in data maintenance costs, enabling countless start-ups around the world to enjoy cloud storage services that can expand their technology and better store. your information. (Ismail, et al. 2015).

Cognitive Computation (Artificial Intelligence)

According to Andrade (2018), Artificial Intelligence (AI) is a field of study that explains and "imitates" intelligent behavior through computational processes, performing decision-making, problem solving, and learning tasks. According to the author, AI is concerned with understanding and building intelligent entities and has the ability to automate equally intelligent processes.

The concept of artificial neural networks (RNA) is crucial for AI, it is computational models based on the central nervous system of animals, which have the ability to learn and recognize patterns. RNAs generally present themselves as interconnected neuron systems that can receive input values (imputs), emulating the behavior of animal neural networks.

Systems capable of learning from data, RNAs have been used to solve highly complex tasks from common rule-based programming, speech recognition and computer vision - a science that develops technology for building artificial systems that get information from images or any other multi-dimensional data.

Another widely used concept in AI is fuzzy logic, which is the form of logic in which the logical values of variables can represent any real number between 0, corresponding to the false value, and 1, corresponding to the true value. The concept has been extended to deal with the concept of partial truth, where the truth value can comprehend between completely true and completely false. Also, when linguistic variables are used, these degrees can be manipulated by specific functions. (Ahlawat, N. et al, 2014, p.630)

Big Data

Founded in the 1990s, and attributed to John Mashey (computer scientist, director and entrepreneur in the US), Big Data tends to include data sets that are sized beyond the ability of commonly used software tools to capture, organize, manage. and process data within a tolerable elapsed time. (ANDRADE, No. 2018, p.360)

For Dans (2011) Big Data is about "handling and analyzing huge data repositories, so disproportionately large that it is impossible to handle them with conventional database and analytical tools."

According to Hopkins (2011), Big Data addresses three fundamental aspects:

1) Techniques and technology: The company has people, who have great representativeness and data analysis to generate information with high added value.

2) Large scale of data that exceeds current technology due to its volume, speed and variety.

3) The economic value by making solutions affordable and helping with the company's investment.

"According to Andrade (2018), besides the concepts of the three Vs (volume, variety and velocity), commonly brought by the literature on the subject, other concepts have been expanded to other complementary characteristics of big data:

• Machine Learning: Big data tends not to question, it simply detects patterns.

• Digital footprint: Big data often presents itself as a cost-free byproduct of digital interaction. ”

Unlike Business Intelligence (BI), which uses descriptive statistics with high-density data for measurement and trend detection, big data uses inductive statistics and concepts to identify nonlinear systems to infer laws (regressions, unrelated relationships). linear and causal effects) of large data sets with low information density to reveal relationships and dependencies, or to make predictions of outcomes and behaviors. (ANDRADE, N., 2018. p.361)

Digital Transformation activators

Organizations have been using digital tools that can speed up processes and, as a result, provide a better customer experience and create new and innovative business models. Are they:

Agile Methodology

According to Tomas (2009) The market has been acting faster and faster, demanding high quality results in the short term. Agile methods aim to increase both the quality and speed of deliveries in order to achieve early project entry into the market. They usually promote adaptive planning over rigid and highly detailed planning, self-organized and multidisciplinary teams, continuous improvement and evolutionary development.

In agile methods customer opinion is highly regarded, even as part of the team. The product goes to the market even if it is not its final version, in this case being called PMV - Minimum viable product, launched to the market to be improved through insights brought by the market and users (customers), the so-called evolutionary development. In this way, the end product meets the real business needs. These methods follow an iterative process of development and recurring customer deliveries, which is testing and evaluating this evolution and defining the new features to add, in constant improvement movements that make the process agile and adaptable. (TOMAS, M, 2009)

There are currently different types of agile methodologies, including:

1. Scrum:

Created by Ken Schwaber and Jeff Sutherland, it defines some of the roles, artifacts, and events that make up the method, acting as a framework for product development and support. In this methodology, a software project is divided into Sprints - cycles of 1 to 4 weeks where, each sprint, a product evolution is obtained, which the customer can already use. (Sutherland, 2014)

2. Kanban:

This agile method is part of the famous Toyota production system, and is related to the concept of just in time delivery, programming and controlling and improving productivity through methods and practices that identify areas with potential problems.

It is a visual symbology used in the industry to record actions widely used in Brazil since the 1980s, where it is also called visual management.

3. Feature Driven Development (FDD)

According to Tomás (2009), this methodology brings an object-oriented process applicable to more complex software engineering projects. Created in Singapore between the years 1997 and 1999 by Jeff de Luca, it works very well in conjunction with Scrum as it works in project management and FDD acts in the development process.

FDD has five basic processes.

• Comprehensive model development (Object Oriented Analysis);
• Feature List Building
• Plan by functionality (Incremental planning);
• Detail by functionality
• Build by functionality

Application Programming Interface - Management

Today, the vast majority of developed applications work exclusively over the Internet, being consumed on desktops, smartphone notebooks or tablets, that is, regardless of platform. At the same time, organizations are constantly feeding their management software (management information, ERPs). Faced with these two scenarios - the need for enterprises and applications accessed by the network - a solution was needed to bridge this gap, so that two different systems share data and functions. Thus, an API is a set of standards, guidelines, and practices involving programming codes that allow software to access the functionality of an application. (MASSÉ, M. 2012, p.5)

Geris APIs can imply simplifying system scaling and speeding implementation of features, so managing APIs becomes highly strategic. These currently follow the standards of Representational State Transfer (REST), which consists of a web services architecture (MASSÉ, M. 2012, p.6)

DevOps

Term from the combination of the terms - and practices - of "development" and "operations", is a software engineering practice that aims to unify software development and operation.

DevOps practices symbolize a convergence between many managerial and philosophical movements and are therefore the result of applying the most reliable principles of physical manufacturing and leadership in the IT value stream. It encompasses Lean values, resilience engineering, Toyota Production system, learning organizations, human factors, safety culture, constraint theory. Relevant contexts such as high trust management cultures, organizational change management, and server leadership are also included. As an end product, organizations achieve quality, high reliability of end products and processes, stability and security at ever-lower costs. (KIM et al, 2018.p.4)

Information Management

According to Fontes (2006), information security is the term that designates the set of guidelines, rules, policies and procedures that aims to protect the information resource enabling the execution of the organizational strategy, existing to minimize business baits.

According to Lyra (2015), there are three pillars that act as the basic principles of information security. Are they:

- Confidentiality: This is the guarantee that access to information will only be made by certain users, also called legitimate users.
- Integrity: Affirms that the information must be preserved and kept under the same conditions as the information provided by the owner. The purpose is to protect it against unintentional or unintended changes.
- Availability: States that, whatever the purpose for which the information is intended, should be available.

The object of this protection is any data and / or information of any value to the organization, such as contracts and agreements, system documentation, databases, user manuals, systems, applications, removable media, computer equipment, among other elements, called "information assets". (LYRA, Maurício M., 2015. p.11).

Exponential Organizations

ExOs are built on Information Technology (IT), which dematerialize what is physical in nature and transfer it to the digital world on demand. Thus, they do not use large physical structures or large numbers of employees. (ISMAIL et al; 2015)

To be considered an ExO, the organization must have a Massive Transformer Purpose (PTM) in addition to ten other attributes that reflect internal and external mechanisms that are continually being leveraged to achieve exponential growth. , we use the acronym SCALE (Staff on Demand, Community and Crowd, Leverage Assets, Algorithms and Engagement) and for external attributes we use the acronym IDEAS (Interfaces, Dashboards, Experimentation, Autonomy and Social Technologies). Not all ExOs have the ten attributes, however, there are a minimum of four attributes to be considered as ExO and the more attributes the more expandable they tend to be (ISMAIL et al; 2015. p.50

Below, in Table 5, we can see examples of some Exos known in the market where they operate and their SCALE attributes:

ExO	Atribute SCALE
Uber	Algorithm
TED	engagement
Waze	Leverage actives
Google	Comunity algorithms
Github	Comunity

Source: Ismail *et al*, 2015

In today's information age, the process of digital transformation is broad. In 2012, 93% of US business transactions were already digital; Sophisticated digital cameras, like Nikon's, no longer exist: they have been surpassed by cameras attached to smartphones; maps and atlases replaced by GPS, already surpassed also by applications in mobile phones; libraries, music and book readers as well. Retail stores being replaced by e-commerce icon AliExpress and Tesla launching more sophisticated electronic cars than personal computers.

The ExO paradigm was first identified in 2009 and, after years of observation and research, Ismail et al (2015), note that this paradigm applies to other major markets as well:

> There is a growing recognition that the pace of change seen in computing is occurring in other technologies and to the same effect. For example, the first human genome was sequenced in 2000 at a cost of $ 2.7 billion. Due to the underlying accelerations in computing, sensors, and new measurement techniques, the cost of DNA sequencing has decreased at a rate five times higher than Moore's law. In 2011, Dr Moore had his own genome sequenced for $ 100,000. Today, this same sequencing costs about $ 1,000. (Ismail et al; 2015)

According to Ismail et al (2015), ten years ago there were 500 million devices connected to the internet. There are currently about 8 billion. The projection for 2020 is 50 billion and, by 2030, one trillion connected devices.

Applying Moore's Law or LOAR in this scenario, we observe that we have only traveled 1% of this path, ie according to Moore and Kurzweil apud Ismail et al (2015), all growth is still ahead of us. Such disruption was initiated with some products and services such as books (Amazon), hosting (Airbnb), travel (Booking.com), auction (eBay). In some industries, entire industries have been destabilized such as the music industry by Apple iTunes or the major rental networks by Netflix.

As we resume, the concept of ExOs: An Exponential Organization (ExO) is one whose impact (or outcome) is disproportionately large - at least ten times greater - than that of its peers, due to the use of new organizational techniques that leverage accelerated technologies. (ISMAIL et al. 2015. p. 19). We can list the ten most relevant ExOs in your industry (in alphabetical order):

Quadro 8: As cinco ExOs mais relevantes em seu setor

ExO	Field	Market value (in billion USD)	Exponential Quo/ 84 pontos
Github	Technology	7.5	76
Airbnb	Lodging	25.5	84
Uber	Mobility	51	73
Indiegogo	Crowdfunding	60.5	73
Google	Internet	143	73

Source : Author ellaboration

In order to achieve scalability, ExOs have brought a new and disruptive pattern. Instead of owning assets or a large fixed staff, they leverage external resources to achieve their goals. It maintains a small core of employees and facilities, allowing for much flexibility as they focus on exponentially increasing their profit margins. They recruit their customers and foster online and offline communities to design and develop products. As a result, they grow to important levels in a short time. (Ismail, et al; 2015)

The most relevant result of a well-designed PTM is that it will generate a cultural movement that ensures strong attractiveness, inspiring people to the point of generating a community around ExO (Ismail *et al*, 2015)

The Theory of Exponential Organizations is based on three important theories: Theory of Abundance, Theory of Disruptive Innovation and Theory of Singularity, which will be described below.

Abundancy theory

Diamandis and Kotler (2012), authors of Theory, state that, with progress in the areas of artificial intelligence, robotics, digital manufacturing, nanomaterials, synthetic biology and many other exponential growth technologies, we will achieve greater gains over the next two decades than in the past. of the last two centuries.

According to Ismail et al (2015), to make this possible, there are four emerging forces: exponential technologies, innovators who follow the do-it-yourself philosophy, technophilanthropists and the rising billion (the group of the poorest individuals in the world who The next ten years will become one of the most important forces.) that conspire to solve humanity's greatest problems because, thanks to exponential technologies, small groups of people can solve big problems.

Diamandis and Kotler (2012) state that abundance theory has been happening for the past two decades, with the advent of the internet and wireless technologies spreading across the globe, accessible to most of the planet's population. According to the authors, we are already experiencing this world of abundance in communications and access to information. (DIAMANDIS; KOTLER, 2012)

> What is important here is the unbelievable spread of exponentially growing technologies and the impressive potential of these technologies to improve global living standards. A distant future where we have artificial intelligence in our brains sounds auspicious (at least to me), but how about a near future where artificial intelligences could be used to diagnose

> illness, help educate our children or supervise an intelligent energy grid? The possibilities are immense (DIAMANDIS; KOTLER, 2012, p 77).

Disruptive innovation theory

In 1942 economist Joseph Schumpeter publishes his book Capitalism, Socialism, and Democracy, which is rapidly gaining momentum in a rising moment of neoliberalism and neoconservatism. In the book, the author describes the process of innovation, where new products destroy companies and old business models and, for him, are the main driving force of long-term sustained economic growth (MAGALDI, S; NETO, JOSÉ S. , 2018).

According to Schumpeter apud Magaldi, S; Neto, José S., 2018, the process of creative destruction is the essential fact of capitalism, the innovative entrepreneur being its protagonist.

Johnson, B e Christensen, C. (2012) states that large companies, even taking wise actions such as listening to their customers, staying competitive and investing heavily in high technology, lose their leadership in the market where they are faced with competitors offering simpler, disruptive solutions. and less costly. For the author, it is disruptive innovation that creates new markets, combats non-consumption and promotes job growth and is thus a multiplier economic effect on the chain.

Schumpeter (1988) argues that innovation is the great focus of organizations to remain competitive over time with their competitors. According to the author, innovation is the product of new combinations, characterized by the insertion of a new product, process or market or the discovery of new raw materials.

For Peter Drucker (1962) innovation translates into value creation, either by creating a new product or service, or by repositioning existing products, bringing you new functionality. For the author, entrepreneurs use it to create new business opportunities. Schumpeter (1939) creates the concept of creative destruction, based on the observation of the difficulties found by organizations already consolidated in their markets to innovate. For him, innovation is the transforming impulse for reinvention, an important characteristic of capitalism. And it claims that reinvention alone is not enough, and includes the destruction and replacement of certain production methods and markets as part of this process.

Singularity University

The term "uniqueness" coined by John Von Neuman brings reflections on technological progress being associated with accelerated change: "The acceleration of technological progress and changes in the human way of life give a appearance of essential uniqueness in the history of race beyond which human affairs, as we know them, cannot continue. "(Neuman, J.V .; 1950)

Ray Solomonoff´s, American Researcher in the field of Artificial Intelligence, Inspired by Moore's Law (1965), previously seen in Theory of Exponential Organizations, the author gave his contribution to Theory by mathematically presenting a progression of intelligence self-improvement capabilities. over time, in his article The Time Scale of Artificial Intelligence, 1985

Research and Methodology

This study brings a new theme, with little theoretical foundation. Therefore, an exploratory qualitative research will be applied in a semi-structured questionnaire. This method was chosen because there was a need to fill in some of the gaps that appear in the study, because it is a new theme. Therefore, the objective of the research is to gather information and not to obtain statistical conclusions.

The research will be carried out in three stages, as follows:

In the first stage, organizations with characteristics of ExOs will be listed for the application of the research. To be selected, companies must meet the minimum requirements that characterize them as exponential organizations. For this we will use the two acronyms SCALE for external aspect analysis and IDEAS for internal aspect analysis. In addition, they must have a highly inspiring Massive Transformer purpose (PTM), it forms a community around the organization, and is so comprehensive that there is no place for competition other than below it.

In the second stage, a field research will be conducted based on the theoretical framework in order to understand the influence of digital transformations on ExOs. to verify whether or not the foundations, technologies, and tools used by exponential organizations are related to digital transformation. The questionnaire will be divided into three parts:

a) The first part will contain questions regarding the pillars of digital transformation (processes, customer experience and business models)

b) The second part will contain questions about the tools that materialize ExOs (social media, big data, cloud computing, IoT)

c) The third part will contain questions that involve the use of transformation enabling elements in ExOs (Agile Methodologies, API Management, DevOps and Security)

For this research, six organizations were chosen, they are:

1.Taqe: Developed an application that matches operational level professionals and available job openings.

2.Pag Seguros: pioneer and leader in the Brazilian online payment market.

3.UpLexis: a company specialized in technologies for searching and structuring information from big data extracted from the internet and other knowledge bases.

4. Organic Gourmet: High-end food selling platform

5. eGuincho: Technology company focused on the automotive 24/7 assistance market, bringing agility and efficiency.

6. Bynd: is a corporate mobility solution that uses technology to fill empty seats in cars through the ride.

For the third stage of the research, the results obtained with the questionnaire will be compiled to answer the research question: are digital transformation and exponential organizations both sides of the same coin?

A qualitative analysis will be performed on the answers to the questionnaire, which will be applied in an interview with two or three managers of each company, from different areas, in person, or with the

founders / co-founders. Based on the results obtained, we will make the analysis based on the theories already explained in the theoretical framework. The main objective is to bring real situations of ExOs to demonstrate if they make use of most of the resources presented here in the theoretical framework.

The analysis will be performed based on the data collected through the application of the semi-structured questionnaire whose objective was to verify if the bases on which exponential organizations are based are in sync with the pillars of digital transformation; if the technologies used by exponential organizations can be classified according to the agents of digital transformation and if the tools used by the organizations studied represent the majority of activators of digital transformation

We found that 66.7% of respondent companies report heavily using business processes in their organizations, while 80% report using organizational processes and all 100% make use of management processes for benchmarking, controls and possible adjustments needed. the operation.

Company	Business Process	Organizational Process	Management Process
Bynd	X	x	x
Orgânico Gourmet	X	x	x
Taqe	X	x	x
UpLexis	X	x	x
eGuincho	X		x
PagSeguro		x	x

Regarding the Customer Experience, there is great concern on the part of the organizations analyzed to constantly observe and improve it.

According to Rodgers (2018), in the Digital Age, we leave a model characterized by mass markets to a customer network model, brought about by the network effect.

According to the survey, for 100% of respondent companies, the user experience is an important focal point, noting the use of different tools, some common. Another important point analyzed was the business models where, once again, the full influence of digital transformation can be observed. (Graphic 1)

According to Rodgers (2018), for organizations to dominate competition in the digital age, business models must evolve. And we also need to be clear about the growing importance of strategies for building platforms, not just products.

Platform-based business models feature an innovative and powerful new paradigm, the network effect. This represents a new economic paradigm, totally driven by the technological revolution. Economies of scale in the digital age draw on advances in technology that affect demand (Parker, G. et al., 2018). Social networks, application development, and other actions that use technology to create more value for users are factors that leverage economies of scale from a demand standpoint. These factors have the power to provide the leading company in a network platform marketplace that is important and difficult for competitors to achieve.

Considering how value has been created and transferred in most markets, we note the pipeline system, a type of business that follows a step-by-step approach to creating and transferring value. As a first step, the company designs the product / service, then it is manufactured and put up for sale, and in the end, the

commercial area looks for a customer to buy it. This model can be considered a linear value chain because it is a one-way model (Parker et al.; 2018).

When analyzing the new platform business model, it is observed that this is a more complex system, where all involved (producers, consumers and the platform itself) establish a set of relationships. These different actors interact in connection, using the resources provided by the platform and creating, in various ways, the value proposition for the business.

In the business model analysis of the respondent companies, 66.7% use business models in digital platforms / marketplaces, while the other 33.3% preferred to establish their business in software as a service (SaaS) models. In both formats we could clearly see the digital model, which allows for an important reach in visibility for the target audience, easier to segment and achieved through digital means, as well as high scalability in a short time.

Analyzing the activators of digital transformation in organizations, according to the verified pillar, we started to collect data about the use of corporate digital media in these organizations.

According to Andrade (2018), corporate social networking can increase operational performance capabilities in a variety of ways by allowing salespeople to find new customers; help the marketing team learn about customer needs and demands and teach management about the public perceptions of their strategy or approach.

In the organizations studied, there is a strong use of digital media for customer segmentation and capture, communication with the target audience, prospecting and commercial approach, brand building and positioning. There is a strong presence of corporate social media in 100% of the analyzed companies.

The second tool whose presence was analyzed in each of the organizations was Cloud Computing.

According to Brandt (2012), the phenomenon of cloud computing consists of using a program installed on a web server that is elsewhere, rather than installing it on the desktop itself.

Once again it is possible to notice the resource utilization in all analyzed companies, that is, 100% of the respondent companies have their cloud hosted business models, either in the platform model (67%) or in the SaaS model (33%).

Concerning the third activator of Digital Transformation, Artificial Intelligence (AI) was also checked to understand if AI resources are present in the verified organizations.

According to Andrade (2018), Artificial Intelligence (AI) is a field of study that explains and "imitates" intelligent behavior through computational processes, performing decision-making, problem solving, and learning tasks. According to the author, AI is concerned with understanding and building intelligent entities and has the ability to automate equally intelligent processes.

After the application of a semi-structured questionnaire, there was no presence of tools that brought their use in daily life. Based on all the collected data, it is observed that AI is not yet a feature present in the daily life of these organizations, and its use is not evidenced in any of the tools present.

Regarding the third tool, Big Data, another scenario is presented to us.

> The big data philosophy encompasses unstructured, semi-structured and structured data, however the main focus is on unstructured data. Big Data's "size" is a constantly moving goal of 2012 ranging from a few dozen terabytes

> to many hexabytes of data. Big data requires a set of techniques and technologies with new forms of integration to unlock insights into data sets that are diverse, complex, and large in scale. (ANDRADE, No. 2018, p.361)

For all organizations studied, reports using big data tools are very recurring for a variety of purposes. Decision making, designing products, stratifying and grouping types of customers, financial results, management and monitoring of services provided, inventory checking were the most cited by these companies, who use this type of tool daily to gain insight. business through different aspects of the business.

In the third stage of the questionnaire, questions were asked to verify the presence of activators of digital transformation in these organizations.

The first activator verified was the use of agile methodologies, being Scrum the most used method, including in previous organizations, where the interviewed founders / co-founders came from. According to the collected data, the use of agile methodologies provides a strong increase of efficiency and agility in the process delivery.

Information technology encounters scenarios that are increasingly connected and integrated with other services. Thus, another verified activator is the APIs. For these business models, their management becomes highly strategic. It was observed the use of APIs in all organizations verified, for different purposes, that facilitate or allow the execution of the service provided, and that demands intelligence and data consumption.

These organizations also saw the use of a fourth Digital Transformation activator; the DevOps method.

The term comes from the junction of the terms - and practices - of "development" and "operations", is a software engineering practice that aims to unify software development and operation.

According to KIM et al, (2018 p.4) DevOps practices symbolize a convergence between many managerial and philosophical movements and are therefore the result of applying the most reliable principles of physical manufacturing and value stream leadership. from you.

This activator was not unanimous in the organizations studied, due to different factors. For some organizations, there is no clarity about what benefits could be brought with the implementation of the method, others, using business models in SaaS, do not have local team of developers and others still use in their squads, however Its founders are also unclear about which benefits are generated for the business due to their use.

Finally, there was a fifth activator: data security methods. More familiar and with noticeable benefits, all organizations interviewed have a strong concern and focus on the topic because they deal with sensitive data from their consumers. According to some founders, exposing data from their customers can lead to serious brand losses. (Gráfico 5)

Conclusion

The article pointed as a research problem the following question: Is there a link between digital transformation and the emergence of Exponential Organizations?

The contribution proposed by this study concerns the raising of questions about Exponential Organizations and does not aim to clarify points about them.

The present work aims to demonstrate that digital transformation, through its pillars, agents and activators, is fundamental for the emergence and development of more agile and dynamic organizations, with exponential characteristics. In order to achieve the general objective the following specific objectives were defined:

(i) verify that the foundations on which exponential organizations are based are in sync with the pillars of digital transformation;

ii) Verify that the technologies used by exponential organizations can be classified according to the agents of digital transformation;

iii) Verify that the tools used by exponential organizations represent the majority of activators of digital transformation.

In order to conceptualize and understand how exponential organizations are constituted, four theories were studied, presented in the theoretical framework of this work, namely: the Singularity Theory, the Abundance Theory and, finally, the Exponential Organizations Theory.

The three specific objectives were partially met, based on the research problem: "Is there a link between digital transformation and the emergence of Exponential Organizations?" To obtain this answer, it was assumed that the questionnaire would provide the answers. necessary for a broader understanding of the business model, based on digital software or platforms, of the transformation activators present in organizations through agile methodologies - used by all respondent companies and digital tools, also present in 100% of the companies surveyed. . Unstructured interviews were conducted with six founders / co-founders of start ups whose business model is SaaS software or digital platforms, and which operate heavily using digital tools. Companies that attribute their scalability to digital tools were also noted, understanding that without them, the scope they already have or project for their business in the short term would not be possible. Among the companies studied, there are also reports of elimination of intermediaries, reducing costs for themselves and the end consumer, another aspect that is only possible in the adopted business model.

Some limitations found concern the classification of these companies as exponentials. Note that it is not possible to say with 100% certainty that these are organizations that grow exponentially. There are reports of founders who, facing the current economic scenario, turn their attention to the acquisition of customers, their loyalty to the generation of recurring revenue, showing to be in a slower but solid growth moment, not yet identified with a model of exponential growth.

ExOs have their own characteristics, among them, to use the so-called network effect with great property, in order to obtain high scalability and, consequently, to grow exponentially. Through the Theory of Exponential Organizations it is possible to understand these characteristics and how they impact not only companies but also create and transform markets, and how digital transformation has supported and provided high scalability and, as a consequence, exponential growth.

. Through the application of the questionnaire and interviews, it was possible to verify that the 6 companies analyzed are in compliance with the three pillars of digital transformation, with business models based on software or platforms and whose operation is based on digital tools. While we cannot say that these are exponential, we can say that digital transformation has provided a strong basis for their creation and development.

The study was exploratory in nature, since it is a new theme, a field research was conducted to assess the characteristics of these organizations, if they can be considered exponential, and if there are indications of the presence of the pillars of digital transformation. However, as far as it was possible to measure, it was not possible to verify if they are in fact exponential, but it was possible to verify that if there were no digital transformation, they would not get enough speed to deal with this universe.

Another aspect observed based on the data collected is that innovation alone is not enough, there are several other factors that positively or negatively impact the growth of these organizations such as capital investment, political-economic scenario, cultural aspects, consumer openness to paradigm shifts, among others.

The same is true of the exponential growth provided by digital transformation, the relationship of which we have observed. These organizations do not perceive a focus on this level of growth, but rather the search for a scalable, promising and competitive business in the long term, which leads us to believe, based on the answers provided, that this long-term competitiveness will occur. through successive and constant innovations.

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