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Emergence of Digital Business Ecosystems: A theoretical framework

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Abstract:

This paper seeks to determine what triggers the emergence of Digital Business Ecosystems. To reach this aim, Traditional Business Ecosystems are considered as the initial state from which Digital Business Ecosystems arise. Thus, both of the concepts are defined, stating their characteristics, roles of the actors and stages of formation. Moreover, organizational change theory is adopted in order to explain the cited emergence.

Disruptions from the use of ICTs and the digital transformation initiatives prompt the evolution of Digital Business Ecosystems approach and stimulates the adoption of more innovative means of conducting business. Therefore, organizational change theory is suitable to explain the motives behind the potential shift of Business Ecosystems from Traditional to Digital. The inherent triggers can take place within each organization of the ecosystem and thus systems theory is advocated; the emphasis on fixing the appropriate organizational goals that involve innovation is the key to meet change. Transition can also emerge from people's own will and the desire to evolve along with the new digital environment, or out of a conflictual situation where norms and rules evolve to embrace the new possibilities that digital offers.

The results of the conceptual literature review confirm that the potential shift towards Digital Business Ecosystems is a reality that could be tackled by encouraging organizational development and fostering co-creation of value in a constantly changing environment.

The findings offer a relevant conceptual contribution to bridge a gap in the DBE existing research regarding the origins of this concept and its driving force.

Keywords: Business Ecosystem, Digital Business Ecosystem, Organizational change theory.
JEL Classification: M19
Paper type: Theoretical research

1. Introduction:

In a context of digital expansion, companies are integrating information and communication technologies (ICT) in their activities more than ever before. Cloud connectivity, smartphone adoption, sensor technology, 3D printing, the Internet of Things (IoT) and other related innovative advancements represent important enablers of organizational development and value creation. In fact, in this context of continuous digital disruption, the mechanisms of value creation rely on the participation of several actors who combine and use assets for the benefit of the overall parties, as opposed to a series of events in which firms take part individually through value-adding activities. (Koch & Windsperger 2017). Thus, value creation increasingly depends on the participation of diverse stakeholders integrating their assets and capabilities benefiting the overall members. In this sense, Barett et al (2015) highlight that value is always co-created. Additionally, businesses are aware of the interdependence between their competitors' and their own competitive actions, and they understand the importance of properly coordinating them to keep the viability of the industry (Brandenburger & Nalebuff 1995).

Due to the ability of businesses to pool resources beyond traditional industry borders, which are typically tightly connected to tangible products, thanks to the digital potential of products and services, horizons of innovation have expanded. Therefore, it became legitimate to talk about "Business Ecosystems"; to contextualize, "Digital Business Ecosystems" are gaining more popularity both in business practice and in academia. Selander et al. (2013) perceive DBE as a network of organizations that share a collective attention in the development of digital innovation in order to execute their own inventive solution. Meaning that Actors of the ecosystem along with Technology work in tandem until reaching the desired performance. This premise displays the "coopetitive" aspect of such ecosystems, where it is expected to both compete and cooperate with the different actors of the ecosystem in a view to prosper. Indubitably, today, DBEs are flourishing and expanding to different extents. The question raised is **what triggered the emergence of Digital Business Ecosystems?**

Previous research has sought to investigate the concept of Business Ecosystem from a variety of angles. The forerunner perspective of the concept by Moore highlights the feature of interaction within a business ecosystem (Moore 1996) and the emphasis on self-organization and decentralized decision-making as key characteristics of Business Ecosystems (Moore 1998). Thereafter, Gossain and Kandiah (1998) relied on these statements to stress the importance of the internet in the modern and digitally enabled economy, and emphasized the need of providing extra information, products and services to clients, and therefore creating value. Lewin and Regine (1999) also contributed to the concept by suggesting co-evolution as an optimal option for businesses operating within disrupted environments where coopetition is evident. Later, Power & Jerjian (2001) assert that managing a complete ecosystem is necessary rather than just managing a firm on its own. Iansiti & Levien (2004) further reveal cooperation, fragmentation, connectivity and competition as main aspects of a business ecosystem.

However, emerging technologies that fuel digital ecosystems have altered the structure and extent of conventional interdependencies. The reach and relevance of digital ecosystems are much greater than those of typical value chains and established organizations. That is, traditional businesses ought to embrace different approaches in order to remain efficient in a digital ecosystem era, just as they work to preserve their enduring assets.

The rise of Digital Business Ecosystems is therefore conceived as imminent. Darking, M., & Whitley, E. (2007) state that DBE has several facets making it possible to think of it either as a project, where it is represented as a research initiative that explores and creates technologies to assist organizations in collaborating and competing internationally using ICT; it can also be perceived as a concept that recognizes the contribution made by the network of organizations and the framework of technologies in the co-creation of value; it can be distinguished as a technology itself that enables businesses to compete on a worldwide scale.

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Accordingly, Traditional Business Ecosystems may eventually give way to digital ones, which is already the case. The need for theorization in DBE research is therefore compelling, specifically regarding understanding the integration of such ecosystem and its emergence through time. The present paper attempts to present a contribution in this sense by reviewing the main concepts of Traditional Business Ecosystems and Digital Business Ecosystem and borrowing the theory of organizational change in order to explain the catalysts behind the emergence of DBE.

2. Concept of Business Ecosystem:

2.1. Definition

The attempt to provide a clear statement of meaning to the concept starts by understanding the ecosystem approach. The New Shorter Oxford English Dictionary (1993) describes ecosystem as "a system of organisms occupying a habitat, together with those aspects of the physical environment with which they interact". Growingly used in economic practices and research, the ecosystem is referred to as "the collaborative arrangements through which firms combine their individual offerings into a coherent, customer-facing solution" (Adner, 2006, p. 98). The approach demonstrates the interdependence of organizations and their environments and offers a novel perspective on the creation of value and co-evolution. (Iansiti and Levien 2004).
The analogy from biological ecosystems depicts the extant similarities between biological ecosystems and business ecosystems. Iansiti and Levien (2004) therefore consider that similar to corporate networks, biological ecosystems are made up of many of weakly connected individuals that are dependent on one another to function and survive. Additionally, biological species in ecosystems share their destiny with one another, just as members of a business network. Every species thrives in a healthy ecology. Each species suffers greatly if the ecology is unhealthy. And just like in commercial ecosystems, rapid changes in ecosystem health can occur. That is, isolating one actor can have undesirable implications, including a negative impact on the whole ecosystem's health. Also, a large variety of organisms is necessary to ensure that at minimum a few of them can adjust quickly to any situation as ecosystems must be prepared to respond to potential mutations and re-adjust both within and outside. Therefore, the heterogeneity of organisms has an effect on the harmony and unity of the entire ecosystem.
As Moore (1993) suggested in his precursor research, businesses are not operating separately, they rather work in coopetition to perform better. "In a business ecosystem, companies coevolve capabilities around a new innovation: they work cooperatively and competitively to support new products, satisfy customer needs, and eventually incorporate the next round of innovations" (Moore, 1993, p. 76). Thus, the functioning of an ecosystem is beyond the control of any actor, owing to the complex and interrelated relationships between ecosystem members. He further designates the actors of a Business Ecosystem as governmental institutions, media, customers, lead producers, competitors, suppliers, and leadership companies.
According to the same author, whose research pioneered the notion of business ecosystem in the early 90's, a Business Ecosystem stands for a grouping of connected organizations that produce valuable goods and services for customers (Moore, 1993). He also advocates the use of the word "Ecosystem" rather than "Industry", as firm's activities are crossing different industries in order to provide customers with a complete approach, which involves the contribution of complementary offers (Moore, 1996, p. 15).
Roles of organizations within Business Ecosystems should therefore be established. According to Iansiti and Levien (2004), four potential roles are highlighted: keystone, niche player, dominator and hub landlords. Keystones are the organizations that function as facilitators and have a big influence on the overall network. They only make up a small portion of the system,

though. Furthermore, the business ecosystem's biggest mass is made up of Niche players who actors focusing essentially on building skills and adding value in niche subsets of an ecosystem. Besides, Hub landlords along with Dominators are entities that draw assets from the system but do not collaborate with one another. Through the use of vertical and horizontal integration, these two types seek to control and own a significant part of an ecosystem.

2.2. Characteristics of Business Ecosystems

When describing the concept of a Business Ecosystem, terminology like "network" and "cluster" are often borrowed. These words are sometimes used interchangeably due to the relative features that they share at first sight. The three terms involve flexibility, agility, innovation and they all imply the co-creation of value by different actors that complement each other to different extents.

With a view to differentiate our main concept from the other notions and get a clearer understanding of the unique features of Business Ecosystems, three characteristics are considered (Sako M. 2018):

- Sustainability: the biological analogy displays living organisms co-existing in harmony within a physical environment in a sustainable manner, same as the business ecosystem where different actors thrive and work together continuously.
  The ecosystem is therefore considered as sustainable for the viability of its existence without the need of outside support, its ability to evolve steadily, and more importantly it capacity to meet its current needs and shortages while taking into account its future commitments.
- Self-governance: this second characteristic reveals the independent feature of Business Ecosystems and views them as autonomous and self-governing structures. No control or external force are perceived in such patterns, and unilateral top-down hierarchical authority is inexistent. Furthermore, this characteristic allows the emergence of new rules emanating from within, as a way to defy previous traditional rules and thus enable the whole ecosystem to thrive.
- Evolution: business ecosystems are expected to evolve with time. Evolution can occur through competition, cooperation and experimentation. The latter is possible through research and development, but also through innovative business models. The process of evolution can lead either to developing further and flourishing as a whole ecosystem, or to stagnate and perish in the worst-case scenario.

2.3. Stages of Business Ecosystems

According to Moore (1993), any business ecosystem undergoes four recognizable stages: birth, expansion, leadership, and self-renewal, or, if self-renewal is not viable, death. This evolution stems from the logic of life-cycle, and joins once again the biological analogy of ecosystems. Moreover, each stage undergoes two main challenges: cooperative challenges and competitive challenges.

As stated by the author, the first stage which is Birth of the ecosystem is focused on the value proposition that businesses offer to the customer. Adner (2017) describes value proposition as the anticipated outcome that the effort's intended receiver will experience. Developing a strong pattern that generates important and unique value to customers, while developing strong relationships with suppliers are the main cooperation challenges of this stage. As for the competitive challenges, Birth of ecosystems is a sensitive stage where protecting the presence and the ideas from competitors is a priority.

The second stage is the Expansion of the ecosystem. At this level, it is expected to improve the activities and test how scalable can they get. The cooperative challenges are about expanding the offer at larger markets and developing the collaborations with the different actors to reach

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this aim. While at the competitive level, what is challenging is reaching the market standard level and getting more offensive to protect its share and potentially enlarge it.
Leadership comes next as the third stage of evolution of Business Ecosystems. High profitability, stability and cohesion are generally reached at this level. The cooperative challenge is about unfolding a larger vision that fosters collaboration between the different actors, and of course maintaining an interesting offer. On the competitive level, challenge is about sustaining a powerful negotiating position with the actors of the ecosystem, namely important clients and suppliers.
The last stage of maturation of a Business Ecosystem can either be the Self-renewal of the Ecosystem or its Death. Both fates are conditioned by the threat of emerging ecosystems. At this level, challenges are more sensed and feared, hence they should be anticipated. At the cooperative level, Business Ecosystems are seeking collaboration with innovators in order to upgrade the existing ecosystem. The competitive challenges on the other hand are about survival of the ecosystem, where high barriers to entry, repulse innovators and prevent them from setting up new ecosystems.

3. The rise of Digital Business Ecosystems:

As presented in the previous part of this paper, Moore (1993) was among the earliest to disseminate the Business Ecosystem concept. The emphasis on networks and value co-creation along with innovation brings about the development of the concept. Thus, the Unit ICT for Business of the European Commission DBE project was the first to elevate the conception of Business Ecosystems to Digital Business Ecosystems (Nachira, 2002). With the aim of understanding this second concept, and more specifically, the emergence of it, the reasoning adopted in this article is binary: Business Ecosystems can be Traditional or Digital. As reported by Senyo et al. (2016), Relationships in Digital Business Ecosystems (DBEs) are built on an integrated dynamic organizational network provided by the Internet, as opposed to exchanges in Traditional Business Ecosystems (TBEs), which rely on direct business-to-business interaction. In order to understand what motives supported this partition, an attempt to expose the substance of Digital Business Ecosystems, as completed in the former part of this work for Business Ecosystems, that are considered as Traditional Business Ecosystems.

3.1. Definition of Digital Business Ecosystem:

Business Ecosystems exhibit the overall organizational interconnections and reflects an all-encompassing dependence of the different actors, but DBE expands this idea by emphasizing the importance of digital technology. Focusing on this last feature, Digital Ecosystems as a concept itself is represented as a technical infrastructure, based on Peer-to-Peer distributed software technology that connects all of the digital elements existent inside the infrastructure and transports, locates and combines data and resources through Internet channels to enable networked exchanges. Nachira et al. (2007) identify it as a virtual habitat comprised of digital elements namely hardware, software applications, and processes. A more updated definition of a digital ecosystem is provided by Jacobides (2019), who describes it as interdependent organizations that are not under the control of a hierarchical authority and are facilitated by modularity.
When combined to Traditional Business Ecosystems, Digital Ecosystems contribute to the establishment of synergy between the different actors and entities, which impacts the level and importance of value co-creation as a main aspect of Business Ecosystems. DBE is therefore referred to as a socio-technical environment of individuals, organizations and digital technologies with collaborative and competitive relationships to co-create value through shared digital platforms (Senyo et al. 2019).

DBE offers an original collaborative mean of conduct for many organizations and individuals to utilize the resources that are requested and accessible as well as the supporting capabilities of the concerned parties to carry out each of their objectives. Therefore, it is anticipated that it will be of great value to the relevant parties. Due because of the various interrelated and dependent connections between the actors, however, it is also frequently complex and challenging to manage such ecosystems.

Actors in DBEs differ from those in TBEs. Namely, Adner & Kapoor (2010) differentiate between two types of actors: focal firms and complementors. The first ones are in charge of creating and maintaining the platform's interfaces and core components, i.e. the interfaces and platform technology used by the complementors to interact with the core product. The second type of actors who are the complementors are required to comply with the rules set forth by the focal firm and, depending on the governance model, develop complements to a varying degree independently and deliver them to the end users.

Furthermore, Tsai C.H. and Zdravkovic J. (2020) attempted to synthetize the roles of these actors within DBEs, and proposed 8 roles which are: Customer, Driver, Complementor, Aggregator, End User, Governor, Modular Producer and Reputation Guardian.

- The customer purchases one or more DBE-created resources.
- The driver creates a shared vision for all DBE actors, enhances a DBE's overall health, including its development, survival, and reputation, while also delivering output to clients and end users through the collaboration of their own assets and abilities with those of other DBE actors.
- The complementor offers resources that, along with some added-value characteristics, complements the main resources (goods, services, information, and money) given in a DBE.
- The aggregator combines a DBE's capabilities and assets to provide integrated products or services to end users.
- The end-user consumes one or more DBE resources and uses Driver to provide feedback and information about its occurrences to other DBE roles.
- The governor develops and/or specifies the DBE's business standards, regulations, policies, principles, norms, and ethics, which he then applies to all members within the DBE.
- The modular producer provides resources within a DBE's specific domain.
- The reputation guardian investigates and evaluates the reliability, solvency, and merit of all DBE actors.

3.2. Characteristics of Digital Business Ecosystems:

DBEs are described by Iansiti et al. (2004) as dynamic, self-organizing, and heterogeneous in nature; characteristics that can be also shared with Business Ecosystems since the members are self-sufficient and accountable for their own survival.

More recent and specific characteristics are identified by Senyo et al. (2018) that elucidate the particularity of DBEs: platform, symbiosis, co-evolution and self-organization.

The first characteristic and the most potent is Platform that is essentially based on hardware, software and networks. Selander et al (2013) describe a platform as a set of resources, innovations, and solutions utilized DBE members to improve their performance, bring innovative ideas, and work alongside. It is worth noting that a DBE may include more than one platform.

Symbiosis is also a characteristic that been emphasized since it is mainly about the synergy and interconnection that exists between the different members of the ecosystem, therefore value co-creation is easily reached. The third characteristic is co-evolution, which imply the collective transition of all the members of the ecosystem. Opportunities or threats are faced collectively

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and all the components of the ecosystems adapt and react jointly to the potential change. The last characteristic is self-organization, that is actually triggered by the complexity of the extant relationships and interconnections between the actors of the ecosystem. Thus, the ability to learn and accordingly react to the environment is key, in order to face the various fluctuations and possibilities that the DBE presents.

3.3. Stages of Digital Business Ecosystems:

Similar to TBEs, DBEs go through specific developmental phases in order to expand and prosper. The logic once again is grounded in life cycle of the ecosystem. Hilbolling (2018) considers three phases: creation, growth, maturity.

At the creation phase, developing a value proposition is the main concern of the DBE actors. These latter are expected to collaborate intensively to face the high level of ambiguity that characterizes new ecosystems (Santos & Eisenhardt, 2009), which is challenging. In light of this, companies organize their innovation paths differently based on the industry, tenure, and goals of their members. In order to prevent conflict, these sources of divergence call for effective alignment of actors.

Growth of the DBE, as the second stage, consists of drawing in and including a large enough amount of complementors to bring the ideal innovative solution into reality after the ecosystem has been established and the primary value proposition has been roughly defined. Therefore, it is crucial to expand the ecosystem of complementors during the following stage of ecosystem in order to produce a wide enough diversity of possibilities for the addition of value to the overall system.

The last stage of evolution is about maintaining the maturity of the DBE. At this level, the focal firm must overpower the emerging ecosystems. Even when a viable ecosystem has amassed an adequate number of complementors to offer a variety of features and functions to satisfy users requirements, continual innovation remains necessary to keep up with competitors.

Another relevant framework for the development and management of DBEs is presented by D'Andrea et al. (2013) where three stages are identified: creation, monitoring and evaluation. Prerequisites such as funds, value generating and sharing processes, as well as strategic choices about the market, competitors, and future trends, must all be considered throughout the formation stage. Monitoring, as the second step, involves measurable standards, competitive resources, ongoing roles and objectives, as well as potential future insights that need to be monitored and handled constantly. While the last phase which is about evaluation rates the capacities for productivity, resilience, and niche development. It is anticipated that problems with DBE establishment and management can be resolved if these conditions are met.

4. Catalyst of Digital Business Ecosystem

After covering the Digital Business Ecosystem conception and exposing its emergence from Traditional Business Ecosystem. We also displayed that The centrality of digital network infrastructure for member's interaction is the main differential between DBE and TBE. The questioning at this stage is about the motives behind the alteration of some TBEs to DBEs.

In this research paper, we propose to approach the organizational change theory in order to clarify what catalyzes the integration of DBEs.

4.1. The organizational change theory

Organizations are the building blocks of Business Ecosystems, traditional are they or digital. Thus, any change occurring within organizations is decidedly impacting the whole Ecosystems to a certain extent. Change is a type of occurrence that can be observed empirically and that results in alterations in an organizational entity's shape, character, or state through time (Van

de ven, A. H., 1995). Organizational change happens as a process through which an organization migrates from a state to another. It can be the movement from a simpler, lower state to a more complex, higher state. There are more options besides this one that change might take. In cases of organizational decline, organizational change might as well take a regressive direction. In this section, we rely on four theories that settle in the organizational change process within ecosystems, inspired from the work of Rhydderch et al. (2004) on their research about organizational change in general practice. The theories deployed are: System, Organizational development, complexity and social worlds, each one highlighting respectively people, evolution, goals and conflict as drivers and triggers for organizational change.

The interdependence of organizational components is stressed by systems theory. Improving one component necessitates evaluation of the system's interactions with other components.

Evaluation of organizational components including infrastructure, technology, and resources - both human and financial- is also considered as crucial. Changing these elements either separately or together can result in organizational transformation.

Organizational change theory is viewed as a particular experience of deliberate action. Change in organizations is achieved through the use of behavioral sciences, emphasizing human dynamics within an organization. Thus, it assumes that agreement between individual and organizational goals is required for successful organizational development.

According to complexity theory, business practices are complex and dynamic, comprised of local agents whose interactions result in distinct behaviors arising unceasingly. Hanseth and Lyytinen (2010) describe it as a major increase in the amount and variety of incorporated elements, relations, and their unpredictable and active interactions with the digital infrastructure. Change occurs in these conditions as an outcome of member's interactions locally within organizations as well as connections between the system and its context. It is believed that attempts to comprehending organizational processes should come before attempts to change it. The focus is on formally assessing processes and frameworks to support members in understanding what functions well and what could be improved.

Last, according to the social worlds theory, change results from negotiations and renegotiations between two or more social worlds. A social world can be represented as a group of individuals who participate in an interaction or share a common interest. Social world individuals may or may not be closely associated, but they all adhere to the same social customs and conventions, including standards for how members of the group should act and behave when interacting. (VicHealth 2019, p. 2).

Thus, to clarify the specificities of the cited theories, six dimensions are suggested. The following table summarizes the object of this categorization regarding organizational change theories:

Table 2: Organizational change theories: main aspects across six dimensions.

	Systems **Goals**	**Organisational development** **People**	**Complexity** **Evolution**	**Social worlds** **Conflict**
Metaphor of organisation	General norms are stable, and change is occasional, irregular and voluntary.		General norms are evolving and self-organizing, and change is continuous, and progressive.	
Analytical framework	A single organization undergoes change.		An organization engages in interaction with another organization or with its environment to generate change.	
Trigger for change	Explicit goals, indicators, and continuous feedback.	Intersection of organizational and personal goals.	Ambition to experiment various strategies and allow orientation progressively unfold over time.	Contrasting views.

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Change process	Goal attainment to generate change.	Lewin's approach to conduct change.	Confucian change that is continuous and irreversible.	Change manifests itself as conflict that eventually reconstructs into a new order.
Role of leader	Setting up indicators and feedback mechanisms.	Fostering involvement and participation.	Analyzing the ongoing change with the collaborators.	Approaching diverse agendas strategically.
Resistance to change	Data scarcity and unclear goals.	Divergence of personal and organizational goals.	A step towards the understanding of why change is occurring.	An inevitable step in a conflict situation.

Source: Organizational change theory and the use of indicators in general practice, Rhydderch, M et al. (2004)

4.2. Theoretical postulate:

It is viable then to embrace the cited approaches in order to understand TBE development towards DBE. Our contribution depicts that the four variables: goals, people, evolution and conflict do explain the potential emergence of DBEs.

According to systems theory, a clear, precise, quantifiable goal will serve as the catalyst for change. The ultimate factor in determining how to move forward and what will lead to quality improvement is the feedback captured from an evaluation against the standard or target. Within Traditional Business Ecosystems, organizations (systems), in an interest of thriving, set the goal to mix organizational genes (Nachira, 2002) in novel and innovative ways, resulting in new organisms that will adapt to the new digital business environment. As such, the emphasis is on actions that actors of each system may take to utilize and incorporate new digital technologies into business processes in order to reach predetermined goals such as innovation and competitiveness.

As for the organizational development theory, it aims to produce change that members are enthusiastic about. The intersection of individuals and corporate goals is the catalyst for transformation. In the context of Digital Business Ecosystem, autonomous people and teams act as independent nodes, linking across boundaries to collaborate for a shared goal. Koch et al. (2017) describes nodes as actors namely organizations, teams, individuals that are linked by a network of continuous social interactions. Change, in this sense, features many leaders, a large number of consensual interconnections, and overlapping levels.

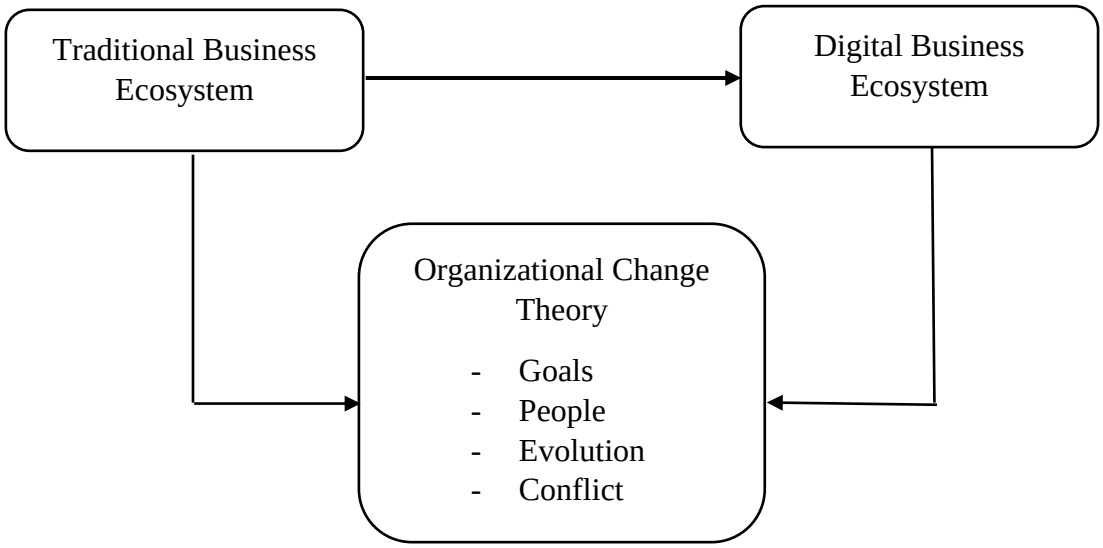
Also, according to the complexity theory, rather than being influenced by standards and measurable metrics, change is seen as an evolution of existing activities. That is, the increased reliance on Information and Communication Technology (ICT) in value co-creation and the disruption of digital transformation are perceived as enablers to perform better, regardless of the challenges they imply. Also, the dynamic networking of organizations in DBEs encourages the continuous collaboration of the participants on the field and the integration of resources in the ecosystem, resulting in the development of a community that brings together business, knowledge, and infrastructures, despite the complexity that characterizes the links between the ecosystem members.

And last, social worlds theory denotes that conflict between two distinct social worlds, is what ultimately leads to change. Hence, the self-governance feature of Traditional Business Ecosystems where it is encouraged to defy former traditional rules and norms but also enables the emergence of new ones from within, may give rise to conflicts and discord, and eventually be the reason of change and transition to Digital Business Ecosystems. Moreover, Digital Business Ecosystems are made up of interactions that are actively modified by their actors. Actors are confronted to challenging circumstances where they must balance conflicting

interests. Individual businesses must, on the one hand, shape these interactions so they can benefit from them. On the other side, value-generating activities depend on ecosystem participants' cooperation. As a result, corporations must also consider the whole ecosystem's prosperity.

Following is a contribution of a theoretical framework that sums up the main elements treated in this part represented as the potential triggers that lead to the transition towards Digital Business Ecosystems:

Figure 1: Theoretical Framework



Source: The authors.

5. Conclusion:

The ecosystem literature offers a broad vision on how value is created today in organizations. The focus on the ecosystem approach can be considered as legitimate in this continuously evolving context. Seemingly, it is common practice to compare various sorts of structures and activities to ecosystems. As mentioned in this paper, these analogies are used in several areas and highlight various elements of the biological ecosystem. For business ecosystems, pillar concept of the present article, they are viewed as reactive and complex systems, therefore it is easier to gain a deeper understanding of the concepts behind their development, evolution, and interconnection along with taking advantage of previous scientific study conducted in the field. Although much more research is necessary, it has the potential to offer useful insights for managers working in challenging environments.

Following digital progress, there has been, indeed, a growing emphasis on digital ecosystems in ecosystem literature. ICT-related disruptions and digital transformation projects drive the advancement of the DBE framework and encourage the adoption of more creative business practices. The motivations driving the probable transition of Business Ecosystems from Traditional to Digital can therefore be explained by organizational change theory. Systems theory is recommended because the inherent triggers can occur either within each company or throughout the entire ecosystem, and because setting the right goals is so important. The desire to change with the new digital environment or out of a conflictual scenario where conventions and rules change to embrace the new possibilities that digital presents are other motives of transition.

The way businesses and consumers are connected has been rebuilt by new digital technology. It has engendered new interdependencies that are altering the functions of traditional value creation and bringing in novel complementing resources on a never-before-seen scale. It has facilitated the collecting and distribution of detailed data, which can be a key value driver. The

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framework we present in this article, which is founded on the integration of a set of elements, namely goals, people, evolution and conflict, incented by digital, as drivers for organizational change. This contribution can aid conventional organizations in better comprehending these developments and possibly enabling them to engage in DBEs.

The theory borrowing adopted in this paper, namely the organizational change theory applied on an Ecosystem level, is decidedly giving a useful insight for DBE research. Emergence of the latter can be explained by many other factors, but choosing Organizational change theory to approach it is due to its holistic feature and its adaptability to the specific characteristics of Ecosystems. However, although borrowing theory is advantageous in the advancement of research topics that are not enough disseminated like Digital Business Ecosystems, it does present drawbacks such as, the absence of conceptual adjustment between the initial and changed context (Murray, Evers, 1989), and the stagnation of the borrowing field. Such limitations can actually be addressed to this theoretical contribution, although it doesn't alter the originality of the approach. In contrary, it provides a relevant basis to deepen knowledge about emergence of DBEs for future researches.

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