

Digital Economy Ecosystem and Its Elements

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ABSTRACT

Digital business innovation is moving towards business ecosystems generate by driving enhancing interconnection, making it easy and quick to connect each unit of it. Business ecosystems opening access to the capabilities, resources and talent on a global scale that sets the stage for innovation. Which talented, skills, knowledges entrepreneurs should have considering the needs of development digital companies' development? The aim of this article represents review of scientific literature is therefore to analyze the key elements impacted to create ecosystem of digital economy whereas e-commerce growth. The factors that are the driving force behind the digital company's success in the digital economy. The results of the literature review require the definition of the digital economy concept. For the digital business, the focus will be on the development of knowledge, while creating a global information infrastructure, as well as networking enchanted development of ICT business. The study examines the main elements and their characteristics, which are based on knowledge, innovation and the ability to transform, agility. The interaction of identifying elements is refined with the concept of the digital economy ecosystem.

Keywords: Digital economy, Ecosystem, Digital competence, E-commerce, Knowledge, Skills.

1. INTRODUCTION

The transformation of the Digital evolution is affecting the entire economy in multiple ways: new business models are emerging, companies modify their engagement in innovation processes, and capabilities at the heart of firms' activities are rapidly changing. This offers both opportunities and challenges for different actors such as Technological Developed Companies and consumers in innovation ecosystems. The following changes raise fundamental questions for strategy: "What is the role of innovation policies in the digital transformation? What new forms of trained skills and competence is this 'digital transformation revolution' going to require? [12]". Digital systems have facilitated societal changes, have impacted political issues, and have increased awareness of key social issues [9].

Since Don Tapscott originally had defined in his book "Digital Economy: Promise and Peril in the Age of Networked Intelligence" in 1995. The Digital economy is referred as an economy that is based on digital computing technologies. Lately, the concept of Digital Economy outlines which emerge

from the literature which has four specific features: the irrelevance of geographical location, the key role played by platforms, the importance of network effects and the use of Big Data. These features distinguish it from the traditional economy, particularly as a result of the associated value chain transformations' [13].

There are numerous forms of traditional companies transforming to succeed in the digital economy as well. Most of representative of the retail trade initially developed websites to enable online sales. As the world moves more fully into the digital economy, forward-thinking retailers now leverage technologies to reach and serve customers through a variety of channels. The leading retailers use online sales and mobile apps to identify buyers, whether they're shopping via the internet or in person. Consumer's interests are figured out by collecting and analyzing for better browse and sales data. Receiving data facilitate reaching out to customers via social media, allowing for better service and ultimately higher sales and increased brand loyalty.

Considering in this vein, the New or Digital Economy is about dynamics, not static efficiency. It is about new activities and communication what move towards higher productivity. While economic growth can be described at the macro level, as results when a variety of actors create and use new technology.

New technology is the result of new combinations of ideas. When connectivity increases, the number of possible new combinations increases also. What is really new in the New Digital Economy is the emerged growth of the Information and communication technology (ICT) a new level and direction of connectivity among multiple heterogeneous ideas and participants, giving rise to a vast new range of combinations. [8].

According to authors of Digital Business Ecosystem research Nachira et.al [25] show the interaction between research strands in philosophy of science, epistemology (theory of knowledge), cybernetics, information theory, linguistics, and communication theory brought to a revolution in the studies of human behavior, interaction, and communications, led by the Palo Alto school [13]. The researchers expressed concerns whether the Digital Business Economy study efforts will lead to a new science of the interaction and communications between economic and digital actors. But the vastness of the scientific challenges and of the research beginning to distinguish, does not imply that the findings will be transferable to the market only after several years and that such endeavor will produce a tangible social and economic impact only in the long-term. It has been verified in the field that the evolutionary mechanisms grounding this research area, even in their initial elementary implementation, could be successfully applied and transferred, activating

services and mechanisms capable of becoming more intelligent and effective over time.

The different areas of science, but also the actors involved in the process, have interactions and express themselves using common languages and models.

The *object of research* is digital economy and its elements. The *subject* of research is interaction of digital economy ecosystem elements and its characteristics such as knowledge management, digital competence and communications technology features infrastructure and services within digital business ecosystem.

The methodology: literature overview comprising and interpretation applying scoping review method which allows assessing what is known about the practical issues, uses systematic review methods to search appraise existing research. New digital era requires at redefining the traditional definition of Economics. Such a direction creates a new perspective on economic and social relations, opportunities and constraints. The main components of the digital economy and basic questions are presented concerning the formation of the ecosystem. The Modern society is actively developing, changing the traditional form of communication to digital, using various means of communication. At the same time, there is a growing need to create a strong communication between the active parts of the market and its effectiveness. Accordingly, there is a high need for specialists with the necessary skills in the processes that become digitalized. In this regard, there is an urgent question of how to develop the evolution of the human Digi.

2. METHODOLOGICAL BACKGROUND OVERVIEW

Citing of Betsy Burton, Vice President Distinguished Analyst and Marcus Blosch, Research Vice President of Gartner Inc. All organizations are part of business ecosystems made up of a variety of actors, including customers, partners, regulators, competitors and even devices in the Internet of Things. Innovations in technology have driven ever-increasing interconnection at every level. Now, the vast majority of organizations exist in multiple overlapping and interconnected business ecosystems, a trend that will continue to set the stage for innovations and new business models.

Previously, only the largest players could significantly impact the direction and evolution of a business ecosystem — by controlling access to information, creating strategic partnerships, changing pricing, introducing products or services, or engaging in mergers and acquisitions. Nowadays, the organizations have access to combine amounts of information and resources and can collaborate with new customers and partners [15]. Previously, only the largest players could significantly impact the direction and evolution of a business ecosystem — by controlling access to information, creating strategic partnerships, changing pricing, introducing products or services, or engaging in mergers and acquisitions. Nowadays, the organizations have access to combine amounts of information and resources and can collaborate with new customers and partners.

Actual questions are raised by Gartner specialists about isn't the business ecosystem just something the digital business startups care about? Does it really affect more traditional businesses or government organizations as parties of their business ecosystem? Every organization is exposed to the opportunities and risks of their business ecosystem [15].

Initiating a research area in Digital Business Ecosystems implied several courageous assumptions, which enabled a change of perspective. Digital Ecosystems research it refers to the balancing effect that a greater level of integration of the social and cultural context with the economic life is assumed to have on its long-term economic viability [25].

Referred to Andy Rowsell-Jones's discourse, Gartner vice president and research director consider that Digitalization in most enterprises is maturing, and as it does, it becomes more likely that these enterprises will become part of a digital ecosystem, during his session at Gartner Symposium / ITexpo 2016 in Orlando. One side of the market is made up of the consumers who benefit from access to low cost or free services and positive network externalities, since the services become more attractive as user number grow; by accessing these services, however, and whether they realize it or not, they are supplying the platform with sets of data on their personal profile, location and consumer habits. The other side of the market comprises and which also benefit from positive network externalities in proportion to the size of the consumer base. The value of a service for the actors on one side of the market correlates to the number and quality of the actors on the other; economist refer to such phenomena as "cross network externalities" and regard them as a typical feature of two-sided markets. Platform of this kind are funded by levies on the transaction between the two sides of market, but the information which is collect is also valuable to the actors on both sides, representing not only source of data but also body of knowledge; the platform itself is therefore the primary location of value creation for both sides. This business model has introduced the concept of "prosumers" or in other words individuals who produce and consume digitized information. Although rarely paid, prosumers carry out work by supplying data and services for which salaried employees were previously at least partly responsible, such amateur reviews of services or product, user generated content and data entry. The online platform business model can be also be applied to non-for-profit operations such as collaborative platforms for exchanging services in areas. Although networks for exchanging services are not a new phenomenon as such, they have become more visible thanks to their development more visible thanks to their development into mainstream websites and more efficient thanks to their online platforms models [13].

3. RESULT AND DISCUSSION

The study suggests that an extensive analysis of the factors. It can be deemed to identify of ecosystem elements for e-business in emerging growth of the digital economy. Ecosystem has certain functional characteristics that specifically regulate change or maintain the sustainability of an expected balancing state. The shift to business ecosystems requires a change in the people, processes and technologies that underpin the organization [15].

The literary review includes the work of previously published articles, and more relevant articles and papers to see the dynamics and to reveal the trend of changes and approaches to the existence of Digital Economy as an ecosystem in the period from the last ten years. This is an important aspect, since the ecosystem is a living biological organism and its factors influencing its development need to be studied how biological factors influencing the creation of an ecosystem in its classical understanding have been studied [18].

First Cycle Coding.

The identifying characteristics structural coding is a question-based code that acts as a labelling and index device, allowing researchers to quickly access data likely to be relevant to a particular analysis from a larger data set. It's used as a categorisation technique for further qualitative data analysis.

Secondly Cycle Coding.

Theoretical coding progresses towards discovering the central or core category that identifies the primary theme of the research. The digital economy opens the way for the previously inconceivable integration of industrial systems, transport, cities, energy and many other ecosystems into a single standard. In this article, we discuss this project from an industrial point of view. The literature review analysis was presented by the references contained in Table 1.

Table 1.

Literature sources list by systematic review

Category of Digital Economy (DE)	Identified Code	Ref. No.
Advantages	Digital e-business competitive advantage; DE innovation Technology/ DE advantages	[3],[22]
Characteristic	Ecosystem concept/ DE characteristics	[18]
Concept	DE concept	[33]
Definition	Digital economy definition	[5]
Ecosystem characteristics	DE ecosystem characteristics	[45]
Ecosystem Concept	DE ecosystem concept/ New technology advantages	[21],[26]
Ecosystem elements	DE Ecosystem elements	[4]
Ecosystem Functioning	DE Functioning/ DE Characteristic	[39]
Ecosystem interaction	DE Ecosystem interaction	[44],[19]
Elements	DE segment/ DE concept/ DE elements	[29],[16],[24]
Gap	DE gap not exist the paradigm to redesign of business model/ DE Gap to research/ DE values/ DE Gap DE values/ DE innovation gap	[31],[30],[27],[44]
Innovation development	DE innovation/ DE advantages	[1]
Interaction methodology	DE interaction methodology/ digital business ecosystem concept	[10]
Rights Management	DE value creation by intellectual capital/ Rights Management	[32]
Social security	DE social security	[20]
DE Integration dynamics- pace	DE integration dynamics- pace Digital Evolution Index	[9]
Interdisciplinary connection	DE interdisciplinary connection/ DE advantages	[4]
Innovation driver	DE Concept/ DE value creation/ DE innovation driver DE value creation	[17],[43]

Factors	DE value/ dynamically price creation/DE threats/DE factors	[14],[41],[2],[34-36]
Technology Innovation	Economy Growth/DE value creation/ DE innovation for communication/ consumer-supplier connection in ecosystem/DE advantages/ technology development and innovation	[36],[22],[11],[28]

The frequencies of these categories are a graphical interpretation where the aim is to see the relation of each category towards the frequency.

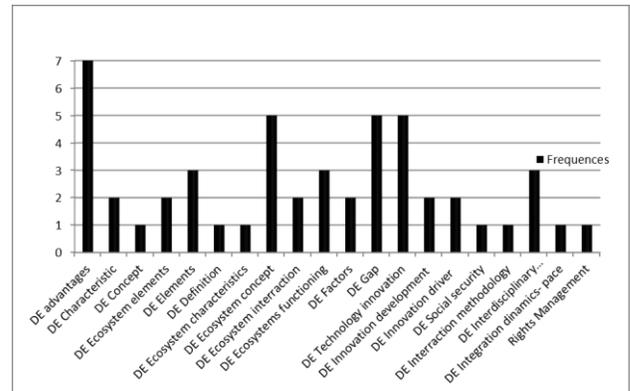


Figure 1. A graphical interpretation category towards the frequency

There are critical mechanisms for capitalizing on business ecosystems opportunities and responding to threats, including APIs, digital platforms, events and programmable economy (including blockchain) [15]. The Gartner research propose the definitions:

Table 2.

Business Ecosystems Economy: Gartner Trend Insight Report [15].

Term	Definition
Business ecosystem	A dynamic network of entities (people, businesses and things) interacting with each other to create and exchange sustainable value for participants. A business ecosystem enables various parties to expose their capabilities and leverage the capabilities of others to create new services, products and customer experiences, driving higher levels of business value. Some organizations will create and run powerful ecosystems; others will participate. Three characteristics make business ecosystems particularly unique in the age of digital business: Business ecosystems will become significantly broader and dramatically more complex; the number of actors and interconnections will increase dramatically, as will the volume of information.
	Business ecosystems are highly fluid and dynamic; they are far more than just a web of connections, and are self-organizing, learning and adaptive. Information is what drives business ecosystems and is set to become the organization's most valued asset as we move from an era of globalization based on things to one of digital globalization.

Digital platform	A business-driven framework that allows a community of partners, providers and customers to share and enhance digital processes and capabilities, or to extend them for business benefit. This framework allows for combinations of business models, leadership, talent, delivery and IT infrastructure platforms that power digital business ecosystems.
API economy	A set of business models and channels — based on secure access of functionality and exchange of data to an ecosystem of developers and the users of the app constructs they build — accessed through an application programming interface (API), either within a company or using the internet, with business partners and customers.
Event	An event represents a change or measure of a monitored state. Event producers detect events and publish them to a channel such as a message queue or topic, data store, or in-memory object. Zero or more event consumers listen for those events on the channel. Event producers and consumers share nothing other than access to the channel and a common understanding of the event object.
Programmable economy	The global-scale aggregation of algorithmic businesses and decentralized autonomous organizations enabled by metacoins platforms — a natively "smart" economic system that supports and/or manages the production and consumption of goods and services, enabling diverse scenarios of exchange of value (monetary and nonmonetary).

To really take advantage of the business ecosystem, organizations must embrace the opportunities and insights that the ecosystem perspective can bring, giving them an edge over those organizations that still see the world as a set of input-output processes. In this chapter of the special report, we provide a collection of research to give readers a deeper insight into the ecosystem perspective [15].

To interpreting data the identified characteristics, it is required to compare the existing model used for the capitalization of the business ecosystem with the theoretical data obtained in the course of literary analysis. Analysis of Gartner eliminate subjective assessment and to identify the relationship of indicators.

Elemental methods are primary approaches to data analysis. And it includes:

Structural coding is a question-based code that acts as a labelling and index device, allowing researchers to quickly access data likely to be relevant to a particular analysis from a larger data set. It's used as a categorization technique for further qualitative data analysis.

Descriptive coding summarizes in a word or noun the basic topic of a passage of qualitative data.

In Vivo Coding refers to coding with a word or short phrase from the actual language found in the qualitative data record.

Process coding uses gerunds ("-ing" words) exclusively to connote action in the data.

Initial Coding is breaking down qualitative data into discrete parts, closely examining them, and comparing them for similarities and differences.

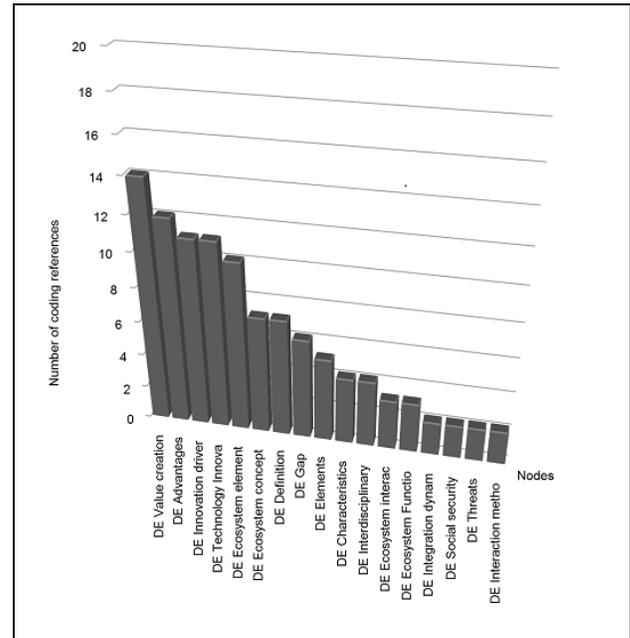


Figure 2. A graphical interpretation category towards the frequency created by NVivo analysis

NVivo has accumulated data from sources with specified characteristics of the environment and displayed a result similar to the theoretical literature analysis.

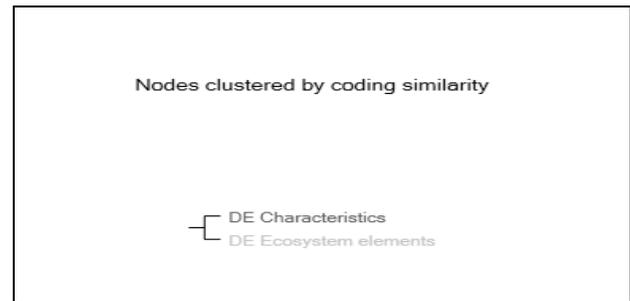


Figure 3. A graphical correlation interpretation created by NVivo analysis

In the subsequent stage, the authors using NVivo compared the accumulated data of literary sources with the given definitions of the Gartner definition of business ecosystem of digital economy. The graph showed a weak, almost imperceptible correlation.

4. CONCLUSION

The authors come to the conclusion that the existing identified codes reflect the impact on the structure of ecosystem for e-commerce. The study obtained twenty elements that are the driving force of the digital company's success in the digital economy. Digital Ecosystem is an interrelated actor's party, as ICT researches, application development, logistics, sales and distributions. All these parties are which sharing digital platforms to interact within systems to fulfill commercial goals. The research result reflects weak correlation between identified characteristic of elements given in scientific literature and practical applied Gartner research.

The definitions represent to leverage approach for engaging in their business ecosystems and determine the right mix of business and technology solutions needed for success.

Following by the results of research authors assume three issues for further studies:

1. Are the literary sources accurate and appropriate? A similar result might indicate erroneous selected sources. Whereas the theorization in the campaign to identify the elements.
2. Since the correlation is weak, zero, the results of the Gartner research are of practical implementations for ICT companies that determine innovative approaches to development, and determine the development trends of the Digital business ecosystem.
3. The elements of the digital ecosystem resulting from a literary analysis reflect a more comprehensive overview of the research approach and take into account the multidisciplinary study of the interactions of the digital transformation of the ecosystem. The transformation to digital business ecosystems requires a change within employees, processes and technologies that sustain the organization. And focuses to existing trends enable to set development parameters for active digital economy groups such as companies and employees and develop their competencies and skills.

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