#### DIGITAL ECONOMY DEVELOPMENT PHASE: RETROSPECTIVE ANALYSIS ON E-BUSINESSES ACROSS EUROPE

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#### ABSTRACT

Technological development and digitization phenomenon, which are having a very powerful presence into our societies and economical systems, are stimulating an irreversible and major change for the socio-economic systems at world-wide level. Initiation, integration and development of technology and digitization in economical systems is based on social, financial and economic purposes, the main objectives for this being the increase of economic efficiency by rationalization of production factors, change the allocation philosophy of resources, redefinition of organizational culture, rebuilding the management systems and so on. This paper is presenting a literature review, determining the relevancy of e-business analysis in front on digital economy development phase.

**KEYWORDS:** development analysis, digital economy, e-business, e-commerce

#### **1. INTRODUCTION**

Digitization phenomenon, based on Internet usage, ICT technologies, cloud computing, digital application, digital devices and other technologies, has a huge impact on the economic system world-wide, fundamentally changing business models and economic models, starting from the phase where they are initiated and ending up in the phase where they produce optimal results. This aggressive development of these technologies determined an irreversible change on the global economy which is continuously developing, completely shifting business models from many industry sectors.

Digitalization, based on the technologies mentioned a priori, is at the level where it can integrate the most complex business processes, which humans can hardly manage or cannot manage at all. Automatization, representing a more mature concept, is now paired and further developed by digitalization, helping hard industries to increase their efficiency and change their know-how, by the digital implementation of economic modeling algorithms, machine learning and artificial intelligence. Also, digitalization is creating the opportunity of new business models with low risks to the capital.

Enterprises have now the possibility to sell goods or services world-wide, no matter where they are (Elia, et al. 2016). Digitalization considerably contributed to liberalization of the markets and the growth of the local economies, by enhancing the selling areas, supported by e-Commerce platform. Because of the digital development, the concept of digital economy appeared, with high economic and social impact, but no common acceptance regarding its definition so far.

The objective of this paper is to analyze the definitions and literature vocabulary, trying to offer the best description on digital economy and how it's improving our economic system.

This will sustain to further determine the most appropriate way to measure digital economy and the place of e-businesses in this process. The research methodology is based on literature review and focused on the researches made in this field so far. This research aims to analyze current definitions

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and to shape digital economy, proofing its size, and statistic data which will support this process of determination the development phase of digital economy. Data will be selected depending on several indicators, which will be defined in this paper. The mission of this paper is to provide a wide perspective of how big in digital economy system, how it can be measured and comprehended.

# 2. RESEARCH METHODOLOGY

This paper is a review of the literature. The main purpose of the article is to describe the development level of the digital economy through a retrospective analysis of e-businesses in Europe. The literature review is conducted to achieve a conceptual delimitation between the digital economy and e-Business, and to determine, at the same time, whether the analysis of e-Business is relevant enough to design statements on digital economy. The databases used in the research include, but are not limited to, ScienceDirect, JSTOR, ResearchGate, Emerald Insights, Web of Science. The search engines used includes Google, Google Scholar, OATD, etc. Public databases such as EUROSTAT, INS, OECD and UNCTAD were also used. The cited research papers date from 1996 to the present. Slightly notable as general, the older writings used are valid. In the research activity we used keywords such as: digital economy; e-commerce; e-business; digital technologies etc. Concluding, in this review we'll determine if the digital economy can be analyzed through e-businesses and how these two concepts are positioning between each other.

# **3. DIGITAL ECONOMY VS. E-BUSINESS**

# 3.1. Defining digital economy

The assessment and analysis of the development level of digital economy at European scale, requires preceding and aligning the concepts of digital economy, e-business and the necessary tools of analyzing the aforementioned, including methods, techniques and benchmarks. Taking into consideration the multidimensional nature of the digital economy and the demand of information ought to satisfy substantial and relevant requests, therefore, in order to detect the level of progress it is imperative to establish a reference framework, whose definition is really complex (OECD, 2014). The heterogeneity of this framework is observed, first of all, in the absence of any definition or universally accepted terminological summary on what digital economy may be comprised of, what its elements are or how they interact between them. The lack of a worldwide commonly accepted definition and its problematic results from the fact that digital economy is imperceptibly interconnected with the physical or off line side of it, being, therefore, extremely difficult to delimit from the conventional economic system (European Parliament, 2015).

Digital economy can represent a mixture of initiatives and technological objectives which make reference to a set of specific economic and social activities, all integrated via Internet and other complex systems (Dahlman et. al. 2016). In a more comprehensive approach, it is mentioned that digital economy comprises the whole economic activity that results from billions of connections formed daily via ICT between individuals, businesses, data and processes, devices. (Deloitte, n.d.)

The core of digital economy is hyperconnectivity, which involves connecting people with organizations and high technology, as a consequence of the usage of ITC and IoT (Deloitte, n.d.). Not even this approach can include all the nuances and structural elements of digital economy, determining a general definition of the complexity that digital economy manifests nowadays.

The concept of digital technology has a multiple significance, in terms of its usage and various destinations. Moreover, the multi-dimensional character of digital economy makes it even harder to create a unitary concept.

In order to establish an analysis of DE (Digital Economy), three reference frameworks can be identified alongside its components, detailed in the following (Bukht & Heeks, 2017). A priori mentioned, at the roots of ED foundation are found digital technologies, but only a limited part of

them, by their definitions, can be identified as being key elements in the foundation of digital economy. The first sphere, comprising the ED core, is the digital sector, the ICT or IT sector, incorporating the ICT technologies, defined as a hybrid sector between the hardware production and services, through which data and information are integrated, processed and displayed into a digital format. (OECD, 2002).

Built on the basis of the first sphere, the second one, a component of digital economy is the digital informatic sector which encompasses digital and economic platforms, conceived on the basis of digital technologies. Among them are found the products and services which have at their core digitization, including digital platforms, mobile applications and electronic payment services. (UNCTAD, 2019). The third sphere of digital economy is digitalized economy. In specialized literature, the difference between digital economy and digitalized economy is traced. Digital economy integrates elements which, by their nature, are completely digitized, having no external support, conventional or undigitized, in their informational circuits, only with the exception of the underlying IT components, hardware. They work and produce results through a fully digitized circuit. The digitalized economy, on the other hand, a much more comprehensive system, includes both the IT sector, ICT, economic and digital platforms, belonging to the digital economy, but also new hybrid systems that work through the synergy between digital and conventional. This category includes e-business, e-commerce platforms, Industry 4.0, precise agriculture, algorithmic economy, collaborative economy and gig economy (Bukht & Heeks, 2017). The structural elements of the digital and digitalized economy are presented in Figure 1.



**Figure 1. – Representation of the structure of digital economy** *Source:* adapted from Heeks (2017, p.13)

The European Commission (2013), through a group of experts in the taxation of the digital economy, defines the digital economy as an economy based on digital technologies, which can also be called the internet economy. The British Computer Society (2014) has a similar approach, adding that access to the Internet and the World Wide Web have a major impact on organizations. The European Parliament (2015) outlines the concept as a complex structure composed of multiple layers, with matrix appearance, connected to each other by a considerable number of nodes. House of Commons (2016) states that the digital economy refers to both access through digital channels to services and goods, but also to the use of digital technologies to support organizations to achieve operational goals or to become more efficient.

Another statement of the concept of digital economy treats the subject as a way of doing things, rather than an independent concept (Elmasry et al. 2016), but with three basic attributes: creating added value to new limitations of businesses; optimizing the process of executing the vision on the customer experience; designing fundamental capabilities that support the entire business system.

In addition to this statement, the impact of digitalization can be discussed, in a broad context - referring to the digital economy, on the creation and distribution of value within the organization, with visible effects on post-production processes (Foster & Graham, 2017). In this sense, there are two major changes debated in the literature: modularization by digitalization of the value chain (Foster et al., 2018; Sturgeon, 2017); increasing the level of added value in the pre-production and post-production phases (Hallward-Driemeier and Nayyar, 2018; Mayer, 2018; Rehnberg and Ponte, 2018).

Figure no. 2 highlights the evolution of the impact of digitalization on the production of goods, including the services sector. The major impact on pre- and post-production processes is due to access to software solutions and digital applications, which facilitate the undertaking of certain activities such as: streamlining procurement through the use of data and software applications; SMART production planning; increasing the level of interactivity with customers; the use of computer tools to streamline the sales process; providing quality after-sales services, etc.



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The use of digital platforms facilitates how information and data can be used to add value to the production process and at the same time improves the economic and social results of organizations (UNCTAD, 2019). The linear production model, in which each component of the value chain adds a limited value to products and services, is no longer valid. From the perspective of integrating information systems into digital platforms and applications, the production model of goods and services makes the transition from a linear to a circular process, in which data and information collected from the linear process are stored and analyzed by mathematical and economic models, to return to the basic process in order to optimize it. The circular model is described in Figure no. 3.



Figure 3. Transition from a linear production cycle to a circular one *Source:* adapted from UNCTAD (2019)

The importance of data, both from users and from the linear production system, cannot be neglected. The upper part of figure no. 3 presents the conventional linear process, which, in the context of the new model, must provide intelligible information that can be processed by specific models. The stage that includes the circular cycle of the new model has a very important role, as it offers coherent solutions to improve the linear process, targeting both internal and external data sources. Thus, the circularity of the new model can contribute to improving products and services, streamlining the process and generating new innovations (Srnicek, 2017). The volume and variety of definitions, the lack of their alignment with certain standards, references, makes it difficult, almost impossible, to precisely define digital economy. There are delimiting statements in the literature, which try to shed light on the structural elements of the digital economy, but also other general ones, which have a high integration character.

## **3.2.** Conceptual delimitations of e-business in the context on digital economy

Accordingly with Heeks (2017), e-business is a component of a digitalized economy, more comprehensive then what he defines as a digital economy. The question that arises in the context of the objective of this paper is whether the retrospective analysis of e-businesses is relevant enough to represent the development level of the digital economy. It is also noted that Heeks (2017) is positioning e-business above the digital economy, with a larger scope than this, and at the same level with e-commerce, Industry 4.0, Precision Agriculture, Algorithmic Economy, Sharing Economy and Gig economy. Thus, in order to understand and analyze the proposed topic, it is necessary to define and delimit e-business compared to the components of the digital and digitalized economy, previously presented. Mesenbourg (2001) defines the digital economy as a complex system consisting of three main elements, as follows: e-business infrastructure, part of the economic infrastructure, which supports electronic business processes and electronic transactions (e-Commerce); electronic business, e-business, representing any business process that is integrated in the electronic, digital environment; e-commerce is the value of goods and services traded through the internet. It is easy to see that Mesenburg treats e-business as a basic structural element. According to OUP (2017) the digital economy is an economy that operates through the use of digital technologies, especially referring to transactions made via the Internet, regardless of their nature (monetary, informational, etc.). Combe (2006) defines e-business as the use of the Internet to connect and accelerate business processes, electronic transactions, communication and organizational collaboration, but also with the external environment (customers, suppliers and other stakeholders). From the analysis of statements on the digital economy, but also of e-businesses, it is understood that any organization, regardless of its size, using the Internet, digital technologies, ICT, software applications, for the integration of certain business processes can be considered -Business.

The alignment of the definitions on e-businesses with those stated by OUP (2017), Mesenbourg (2001) and Heeks (2017) highlights the fact that e-businesses are the main actor of the digital economy, which manages to integrate in its activity all the mentioned technologies. a priori to achieve a specific goal. According to the structural delimitations on the ICT sector, the digital economy and the digital economy defined by Heeks (2017), it appears that e-business is a distinct component of the digital economy. In this context, e-business is a hybrid business, which uses digital technologies, but in its activity are also very important conventional, physical processes. At the same time, within the same boundaries are components such as e-Commerce, Industry 4.0. The next question that arises, from the authors' perspective, is how e-Business is positioned in relation to the other components and what is the differentiating element. The first analysis, which shows the greatest interest in the literature, is on the concepts of e-Business and e-Commerce, which are often used in the same context, without understanding the difference between the two (Zorayda, 2003). The same author states that e-Commerce involves the use of ICT aims to conduct transactions between organizations, but also between organizations and individuals (B2C - Business to Consumer), while e-Business involves the use of ICT and digital technologies for any process of organizations. Zorayda (2003) defines e-Business in detail as the transformation of an organization's processes to deliver more value to consumers through technological applications, representing the paradigm of the new digital economy, referring to three primary processes:

- Production processes, which include procurement activities, orders and inventory updating, electronic payment processing, connecting organizations with suppliers via the Internet and control of production activities through IT applications;
- Consumer-focused processes, including promotion and marketing activities, selling products and services via the Internet, processing customer orders and their payments, providing support and more;
- Internal management processes, including services provided to employees, online training, transmission of information via Internet and intranet, recruitment and selection activities, electronic applications that can optimize circuits and information flows between production processes and sales departments;

It is noted that in the description of consumer-focused processes in the definition stated by Zorayda (2003), we find the description of the concept of e-Commerce, representing the fact that e-Business is a superior e-Commerce system. From the perspective of integration e-Commerce can be an e-Business. A similar conclusion is stated by Chaffey (2004), stating that e-Commerce can be perceived as an element of e-Business. Colin (2006) makes a delimitation of e-Business compared to e-Commerce, represented in figure 4.

e-Business	e-Commerce
Buying and selling electronically	Buy-side e-Commerce
e-Procurement	Sell-side e-Commerce
e-Distribution	
Online customer service	
e-Marketing	
e-Payments	
Processes automation	
e-Collaboration	

Figure. 4. Delimitation between e-Business and e-Commerce *Source:* adapted after Combe (2006)

The delimitation presented in Figure no. 4, although correct and valid at the time of writing this article, it can be given defining additions regarding the digital technologies used to automate internal processes, e-Marketing, e-Procurement and e-Distribution.

The analysis of the e-Business positioning in relation to the defining elements of the digitized economy presented above will be continued. Industry 4.0 is a collective term for technologies that delve into the value chain of organizations, being made up of elements such as the Internet of Things (IoT), cybernetic systems, the Internet of services and Smart Factory (Hermann et al., 2016). Industry 4.0 includes technologies such as Big Data Analytics, Robotic Automation, Cloud Computing, 3D Printing, Augmented Reality, Cyber Security (Erboz, 2020). The use of at least one of the aforementioned technologies requires the use of ICT and Internet technologies to meet the connectivity requirements of the information and systems used, in order for them to generate results. In other words, the implementation of these technologies involves companies integrating at least one process through ICT, which means that any organization that uses these technologies can be considered an e-Business, by applying the mathematical principle of transitivity.

The diversity of ICT technologies, digital applications, associated technologies Industry 4.0 is very large. An e-Business organization can integrate one or more technologies, depending on the object of activity, there are no limitations in this regard. The variety of technologies that can be used in practice can support in stating that there are no commonly accepted indicators to measure e-Business. Electronic business can be found in many forms, precisely from the perspective of technology integration, that it is extremely difficult to measure them. This is also one of the reasons why no conclusive statistics are built on e-Businesses, as there are no commonly accepted benchmarks. Thus, measuring the level of development of the digital economy cannot start from the analysis of the evolution of e-Business. In fact, the progress of e-Business can be presented in the light of the evolution of the Digital Economy, because e-Business can be seen as a catalyst for ICT technologies and applications and not a static component of ED. A study with a limited scope, analyzes the adoption rate of e-Businesses from the perspective of using a web or an application such as ERP (Enterprise Resource Planning) or CRM (Customer Relationship Management). The level of development of the digital economy must be determined on the basis of indices and indicators accepted at European or global level. Also, the analysis of the ED dimension can be customized and viewed from the perspective of e-Commerce, on which a multitude of studies are conducted, considering the fact that they can be more easily tracked and analyzed, but also given the fact that there may be uncorrelated developments between them.

## **3.3. Digital economy development phase across Europe**

As described previously, digital economy can't be measured through e-business deep analysis, but it requires a more comprehensive view which includes social, economic, educational and demographic factors. The European Commission established an indicator with an extended view analysis, used to measure the development on the digital economy across Europe.

This indicator, called DESI (*Digital Economy and Society Index*), is determined as a weighted average between other major indicators. The structure of DESI is based on Connectivity, Human Capital, Use of internet services, Integration of digital technology and Digital public services indicators. Every dimension of the DESI index has multiple sub-dimensions, which are analyzed through a series of indicators (European Commission, 2020).

As we can see in the Figure no. 5, the average DESI for European Union it is slightly above 50% integration of digital economy, being driven especially through Connectivity and Human Capital.

Breaking down the fourth dimension on DESI, *Integration of Digital Technology*, there are visible two sub-dimensions: Business Digitization and e-Commerce. It is very interesting the fact that e-Commerce has a 40% weight, which means this sector has an important influence in analyzing the digital economy.



e-Commerce became an emerging industry with high potential of development because of the permissive business model and the digitization trend, switching from offline shopping to online shopping, which was enhanced as well by the Covid-19 Pandemic. In 2019, 71% of the internet users purchased goods or services online from the 18% of the SMEs, which are selling goods or services using the internet (European Commission, 2020). Even though the number of e-commerce adoption across Europe is small compared to countries such as Ireland, Belgium or Netherlands, this industry is improving from one year to another, enhancing the quality of e-commerce through digital technologies and digital marketing platforms, such as Big Data, Machine Learning, Google Inc. and Facebook Inc. Albeit e-Commerce has not came yet to its maximum potential, looking at the SMEs integration across Europe, many online sellers already started to reinvent themselves, gaining competitive advantage through strategies such as: adoption of minimalism – which serves as a way to offer smooth and clear experiences to the customers; empowering influencer marketing - expected to target a value between the range 5 to 10 billion dollars world-wide, accordingly to MediaKix analysis (2020); content generated by employers - helping e-commerce brands to gain authenticity; personalized shopping journeys; e-commerce brands supporting social and environmental efforts; marketplace adoption (Sellbrite Agency, 2020).

The Covid-19 Pandemic had a huge impact this year on retail trade but also on e-commerce, due to limitation of physical interaction and other restrictions meant to force humanity to stay at home as much as possible, even in work related situations (OECD, 2020). In European Union, sales via mail order or internet had increased in April 2020 with 30%, comparing with the same month back in 2019. At the same time, the total retail sales decreased by 17.9% (OECD, 2020), which means e-Commerce trade supported a lot the local economies, by allowing enterprises to sell and individuals to buy goods or services through the internet. It is also highly expected that the coronavirus pandemic will completely change the way of doing business, selling online and meeting customer expectations.

## 4. CONCLUSIONS

Concluding the results of this paper, based on the literature review performed by the authors, there is no common acceptance regarding the definitions and delimitations between digital economy and e-business, but the two of them are very related to each other. We can affirm that e-business can be considered a catalyst element in a digitalized economy, with a major role in the development of the digital economy. Analyzing the evolution and the current status of e-business across Europe or even

world-wide, won't be enough to determine the development phase of the digital economy, which as described in this paper has a larger perspective then e-business.

Being too difficult to properly identify an e-business, due to lack of acceptance for its definition, there are not so many statistics for e-business in the literature, many of them being limited to e-business adoption rate – also determined from the perspective of ICT technologies, CRM and ERP application integration. More or less commonly accepted, e-business analysis can be completed with indicators associated to e-Commerce, for which more data and statistics can be found, because of its permissive identification.

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