

## The digital economy - outlines and perplexities of its evolution

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**Abstract:** *Due to the evolution of science and knowledge, the digital economy is increasingly a reality associated with technological development and the progress of societies and States – Is Portugal moving in that direction? The objective of this article is to identify the level of evolution of the digital economy in Portugal.*

**Keywords:** *Digital economy, technology, market, digital transformation.*

### I. Introduction

As a result of the evolution of science and knowledge, technology is increasingly becoming a means and, at the same time, a fundamental instrument for economic development and growth, for the progress of society, for the interaction of people, institutions, companies, and markets, and the access to goods and services in the different areas of production and general interest of citizens and consumers.

This evolution, supported by the increase in technology, leads us to the transition from a traditional economy to a new economy that is increasingly digital and global, and, consequently, faster and more demanding. In other words, as markets are increasingly competitive, business strategies in their different formulations, taking into account the goals of competitiveness and sustainability, require companies to adopt a new management model supported by new technological solutions that encourage the maximization of results.

In this context, this paper aims to identify the level of evolution of the digital economy promoted by Portuguese companies, society and the State through the use of digital

solutions in an increasingly competitive market and with a greater increase in this domain.

### II. The digital economy II.I Conceptual and evolutionary elements

As Menezes [1] states "The digital economy is the set of values created by a global ecosystem, composed of people, businesses, and machines hyperconnected and enabled by a series of technologies and data. All this under digital platforms that facilitate connections."

Therefore, we can consider as Lorenzetti alludes [2] that the economy of the networked intelligence era can be equally identified by the digital economy.

In the past, movements (flows) and practices in economic activity were based exclusively on physical support, namely the use of checks, invoices, money, reports, face-to-face meetings, dissemination of information and advertising. In contrast, today digital means and tools are preferred, hence the reference to the digital economy, also identified as the knowledge economy as other authors have mentioned [3].

This means that the emergence and development of the Internet and technological progress have been fundamental in the process of transformation from the traditional economy to the digital economy.

Another author [13] says that "the digital economy is nothing more than a different means of economic activity whose main novelty is, essentially, its extension. That is, as a new means of action, due to its immaterial and inherently flexible quality, it is highly adaptable to practically all pre-existing economic sectors. As such, it becomes primarily a new means of

working rather than an autonomous part of what is, in essence, the economy."

Already in 1997, the Green Paper for the Information Society in Portugal, reflecting the result of efforts initiated in 1996 by a wide range of actors with interests in the information society, stated that Europe was facing intense international competition and that the development of science and technology was a priority.

In the context of the Digital Agenda for Europe launched in 2010 by the European Commission, a forum was held in Portugal for the first time with the exclusive purpose of discussing some key aspects of the digital economy. Since then, significant steps have been taken in the areas of digitization, innovation, and skills, supported by European and national instruments that have emerged (Portugal 2020 and Portugal 2030 Strategy), aiming, in particular, to increase the digitality index, the level of qualifications and digital skills, the productivity of companies and the competitiveness of businesses.

Therefore, the digital economy and its evolution in Portugal, which we are facing, is a sign of the national commitment in this domain and, consequently, of the involvement of society in general, the business sector, and the State in the pursuit of measures and practices that allow a swift and constant interaction in the field of business and the internationalization of companies, the enforcement of rights, duties, and obligations, the development of knowledge and research, the acquisition of skills and social relations.

The Digital Decade 2030 program, currently underway, assumes itself as the key instrument to ensure the continuity of the digital transition process, guided by the evolution of digitality in the economy and society, to consolidate the new era of knowledge and digital economy. In this context, the EC assumed that "Europe intends to empower businesses and people for a human-centric, sustainable and more prosperous digital future." [4] According to that program [5], the digital targets follow four strands or areas for the digital transformation of the Union and consequently for the consolidation of the digital economy - digital skills, digital infrastructure, the digitization of businesses and the digitization of public services.

Figure 1 - Digital Goal Domains  
Source: Digital Decade 2030 Program

## **II.II Main challenges on the business side**

Most companies in Portugal, regardless of their size (micro, small, small and medium-sized and large companies) are faced with the challenges of modernity, competition and digital trends, so their survival requires them to have an effective online presence, corroborative, adaptive and qualified, to attract and keep customers in an increasingly demanding market and with a greater supply of products, goods and services, particularly in terms of differentiation (of the product or service), using the technological component.

In the particular case of small companies, according to the IDC et al. study [6], they are more resistant to the adoption of digital technologies, with negative effects on their competitiveness in the long term. Therefore, they need to overcome a cultural barrier and resistance to change to the assumption of digital transformation as a design to be achieved, to explore the opportunities provided by technological development, investing in digital skills as a driver of their survival and competitiveness.

For IDC et al.[7], the enterprise of the future is "how organizations should organize and invest in participate in digitally centric markets (...) it is characterized by its ability to capitalize on change by continuously deriving value from its core business activities, benefiting and contributing to all its stakeholders, within the company, within the broader ecosystem, as well as within society and the wider environment".

IDC presents nine sets of digital practices fundamental to the process of digital transformation with good results.

In any case, it will be a major challenge for some companies to develop all of the aforementioned areas of digital transformation at once, and IDC believes that in these cases the dimensions that can generate the most impact or where companies have the most capabilities and can generate results the fastest, should be prioritized.

Figure 2 - Digital Practices of the Company of the Future

Source: IDC

Future of Operations: making operations more efficient for resilience and supporting the growing market demand for certain customization.

Future of Work: a work model that promotes human-machine collaboration, enables new skills and work experiences, and supports an environment without limits of time or space.

Future of Intelligence: the ability of an organization to learn and synthesize the information it needs to learn about its environment.

Future of Digital Infrastructure: ensuring reliable digital services and experiences, as the architecture of technology is now the architecture of business.

Future of Connectivity: create comprehensive experiences by orchestrating connectivity across workforce, customers, operations, and partners.

Future of Customer Experience: developing deep relationships with customers by understanding the situation from their point of view and acting on that understanding.

Future of Digital Innovation: the ability to become a software producer that creates and distributes digital services at scale.

Future of Trust: developing digital trust programs to manage an organization's reputation around its digital activities.

Future of Industries: defining the new value in the digital economy, the new role of the enterprise and new partnerships."

The future of business is about ensuring access to business resources regardless of location and equipment, enabling the timely movement of data between people, applications and processes to develop permanent digital functionality.

### II.III Trends and concerns in the digital economy

To obtain elements that help us to know the recent trends and the evolution perspectives of the digital economy, we resorted to the study developed by IDC together with ACEPI on the digital economy in Portugal [8]. Thus, we observed that the Internet usage rate has been growing significantly, with a tendency to get closer in the coming years to the EU average, rising from 75% in 2017 against 84% of the EU, to 94% in 2026 versus 99% of the EU. Since the Internet is an essential tool to support the digital economy, these are good indicators for the growth of the digital economy. In this regard, Lorenzetti already stated in 2002 [9] that "The potential of the Internet has attracted the attention of companies that are developing studies and analyses on the different types of negotiation that the network offers, starting to create a greater presence in the online universe of business".



Figure 3 - Internet usage rate in Portugal and in the European Union (EU)

Source: Eurostat, Individuals – Internet use, Last Internet use: in the last 12 months; IDC Forecasts 2022 to 2026

The following figure also shows the growth of Internet users interacting with public services, with 59% of users in 2021, compared to 65% of the EU average. The survey also showed that the creation of the Mobile Digital Key and

its features had awakened society to the advantages of this tool in interacting with Public Administration services, increasing the number of users.



Figure 4 - % of Internet users interacting with the Public Administration

Source: Eurostat, E-government activities of individuals via websites. Percentage of individuals who used Internet within the last year

In terms of interaction with the banking system, it was observed that the Portuguese are increasingly adhering to banking platforms, reaching in 2021 almost the EU average.



Figure 5 - % of Internet users who use Internet Banking

Source: Eurostat, Percentage of individuals who used Internet in the last 3 months – Internet activities

Also, in terms of e-commerce, there has been a significant increase in the number of online shoppers, especially from 2020 to 2021, assuming here the influence of the restrictions imposed at the time of the covid19 pandemic, and that, in truth, awakened society to the potential of the Internet, making e-commerce more accessible. Hence, the observed forecasts indicate that the rate of Portuguese users who shop online will reach 72% in 2026 compared to 34%

in 2017.



Figure 6 - % of individuals who shop online

Source: Eurostat, percentage of Internet purchases by individuals; Lastonline purchase in the last 12 months; IDC Forecasts 2022 to 2026

When it comes to companies with an Internet presence, according to data from the National Statistics Institute, 62% of companies in Portugal with 10 or more employees had an Internet presence in 2021. Large companies, i.e., with 250 or more employees, reached a rate of 94%, medium-sized companies, with 50 to 249 employees, 78%; and small companies, with 10 to 49 employees, 58%.

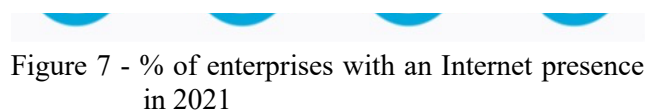


Figure 7 - % of enterprises with an Internet presence in 2021

Source: INE, Proportion of enterprises with 10 and more employees with an Internet presence by employee group

The research also found that companies increasingly use social networks to promote their products and services and to interact with customers and partners to strengthen their visibility in the market.

According to the IDC study report, at the level of digital transformation, artificial intelligence and robotics have higher rates of use by domestic companies than the average of EU countries, with prospects for increasing investment in 2023.

Although there was a reduction in e-commerce in 2021 in the average Portuguese

company compared to 2020, in the particular case of large and medium-sized companies, the percentage figure for e-commerce was higher than the EU average, at 42%, while small companies have a rate of 14%, lower than the European average.

Also, according to the results of surveys applied to organizations in the 2nd half of 2022, as part of the study on the digital economy in Portugal [10], when faced with a question on the political, social, and economic challenges and risks that may have more impact on organizations in the next two years, there was a concern of respondents regarding four main factors, "the shortage of talent with the necessary skills (64%), threats or new regulations related to cybersecurity (48%), political risks, government interventions, and trade tensions (42%) and failures in the execution of digital transformation (41%). With this concern, already the Forum for the Information Society held in October 2010 announced that "digital skills are a fundamental pillar of the digital economy" and of utmost importance for the internationalization of companies, being necessary to attract talent due to the shortage of workers trained in information and communication technologies [11].

#### IV. Conclusions

In the field of analysis of the development of the digital economy in Portugal, in the scope of this article, it was concluded that the Internet, as a driver of the digital economy, has ensured marked progress in access to information, services, and products, generating a change in the habits of society in general, particularly in the use of technological platforms in terms of communication and in the relationship with public administration services in their different areas of public interest and with companies and other organizations, according to the indicators observed.

In the essence of the objective of this article, it was also concluded that more and more companies, regardless of their size, are required to have a permanent online presence subject to consumer scrutiny, due to the diversity of competing offers, to allow the interaction with the market supported on an increasingly technological and efficient logistics component, whose observed results show remarkable growth of digital transformation and consequently the

digital economy in Portugal, creating value, although today very much associated with innovation and knowledge, and less linked to trading and user data [12].

As a final conclusion, we can state that the digital economy in Portugal is booming, with records in general very similar to the average values observed in the EU, namely, concerning consumers - Internet use and e-commerce - and, for the business fabric - Internet presence, e-commerce and digital transformation.

A key public policy mechanism for the growth of these results is the national program Recovery and Resilience Plan running until 2026, aligned with the six relevant pillars of the European strategy 2030 and the concept of sustainability inspired by the United Nations Sustainable Development Goals.

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