The Role of the Digital Economy and E-commerce in Economic Growth in the European Union

دور الاقتصاد الرقمي والتجارة الإلكترونية في النمو الاقتصاديفي دول الاتحاد الأوربي

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Received : 17.01.2024 Reviewed : 29.01.2024 2026.06.30Accepted :

Abstract:This research paper aims to introduce the digital economy and its emergence, as well as to take note of all its elements and components, and the challenges facing its application, while highlighting its importance and the most important differences between it and the traditional economy. It also aims to address some of the applications of the digital economy in the European Union, including e-commerce and blockchain, while providing the latest statistics on changes in e-commerce activity and its contribution to the turnover, and the GDP in the European Union, and a comparison of e-commerce statistics between the countries of the European Union. The study reached several results, the most important of which is that electronic commerce is very popular in the European Union countries, and that electronic market shares are constantly increasing.

Keywords: Digital Economy, E-Commerce, Blockchain.

JEL Classification Codes :F2, O3.

ملخص: تهدف هذه الورقة البحثية إلى التعريف بالاقتصاد الرقمي ونشأته، وكذلك الإحاطة بكافة عناصره ومكوناته، والتحديات التي تواجه تطبيقه، مع إبراز أهميته وأهم الاختلافات بينه وبين الاقتصاد التقليدي. كما يهدف أيضًا إلى تناول بعض تطبيقات الاقتصاد الرقمي في الاتحاد الأوروبي، بما في ذلك التجارة الإلكترونية والبلوكتشين، مع توفير أحدث الإحصائيات حول التغيرات في نشاط التجارة الإلكترونية ومساهمتها في حجم الأعمال، والناتج المحلي الإجمالي في أوروبا، ومقارنة إحصاءات التجارة الإلكترونية بين دول الاتحاد الأوروبي. وتوصلت الدراسة إلى عدة نتائج أهمها أن التجارة الإلكترونية تحظى بشعبية كبيرة في دول الاتحاد الأوروبي، وأن حصص السوق الإلكترونية في تزايد مستمر.

الكلمات المفتاحية:الإقتصاد الرقمي، التجارة الإلكترونية، البلوكتشين

تصنيفات جل:F2,O3

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1. Introduction

There have been three industrial revolutions in history, and some argue that the rise of the digital economy is the fourth. The modern world is now made up of electronic networks that are based on communication networks, information devices, and technologies.

The term "digital economy" refers to a collection of electronic establishments that are interconnected through both internal and external information networks, and it is one of the most notable products of the information revolution that the world is currently witnessing.

where global digital work platforms have increased fivefold in the past decade, according to the latest report of the International Labor Organization, In light of the emergence and spread of digital transactions, which are growing and increasing dramatically, whose transactions have exceeded traditional transactions at the present time, it is expected that they will completely replace traditional transactions in the future and perhaps in the near future, and the digital transformation has affected all areas of life, where many changes have occurred that can not be ignored, the latter which have broader implications for value creation.Therefore, keeping pace with the digital modernity experienced by the world today and the development of the digital economy is closely related to what the government provides to institutions, whether those affiliated to the public sector or those affiliated to the private sector, as well as to the infrastructure it provides related to laws, regulations and communications regulating the digital economy and its applications.

Hence the following problem can be presented:

How does the digital economy through e-commerce contribute to economic growth in the European Union countries?

2.1 The emergence of the digital economy

The digital economy has deep roots dating back to 1921 in the United States of America, when the economist "Frank Knight" presented the first study on the information economy, and in 1954 the economist "Marshall" published his study entitled "An Economic Theory of Organization and Information", but the scientist "McClubb" topped the leading position with his analysis of the patent system economy Which he described as only one part of investing in education, research and technical development, then came his second study, "the industry and distribution of knowledge in the United States" in 1958, to blow up all the structures of traditional economies in the digital space, to fulfill the prophecy of the economist "Derek Price" that information will replace money In the digital economy, which has changed its shape and texture with the impact of technology over time.(faraj & el sayed, 2022, p. 1444)

In 1977, the scientist "Steckler" introduced information as a distinct variable in the analytical formulations, and in 1989 the economist "Kieberg" proposed the developmental information world, which he defined as “the science that studies the impact of information on economic development.”

This scientist built his theory on the assumption that information is an added value. When it is mixed with the material and human elements of production, which adds to it a high value of efficiency and increased production, and then this leads to the development of the overall economy, so the developed countries have taken the decision to develop information technology as a strategic choice to achieve economic development, and this is evident through the amazing development of information and communication technology.(Ghandour, 2005, pp. 121-122)

2.2 The concept and essence of the digital economy

In his 1995 book "The Digital Economy: Promise and Peril in the Age of Networked Intelligence," Canadian author "Don Tapscott" coined the phrase "digital economy.". Subsequently, numerous authors and investigators. who differed in its name, took it up for study, some of whom called it the Internet economy, on the other hand some of them called it the knowledge economy and some scholars refer to it as the information economy, and one of its its Key characteristics is that goods and products are transformed from the tangible physical form to the digital form, as it is easy to store them in the form of numbers so that they are exchanged in the digital market.(Fadhel, 2018, pp. 36-37)

The global network of social and economic activities made possible by information and communications technologies is known as the "digital economy, such as the internet, computers, the cloud, search engines and smart devices.(Rosalind & Jill, 2013, p. 20)

The Organization for Economic Co-operation and Development (OCDE) definition: The digital economy is that economy that produces information and communication technology, and at the same time uses it for production.(Maryann P, 2002, p. 65)Although the economy done online is referred to as the "digital economy," this term does not fully capture the scope of the phenomenon.

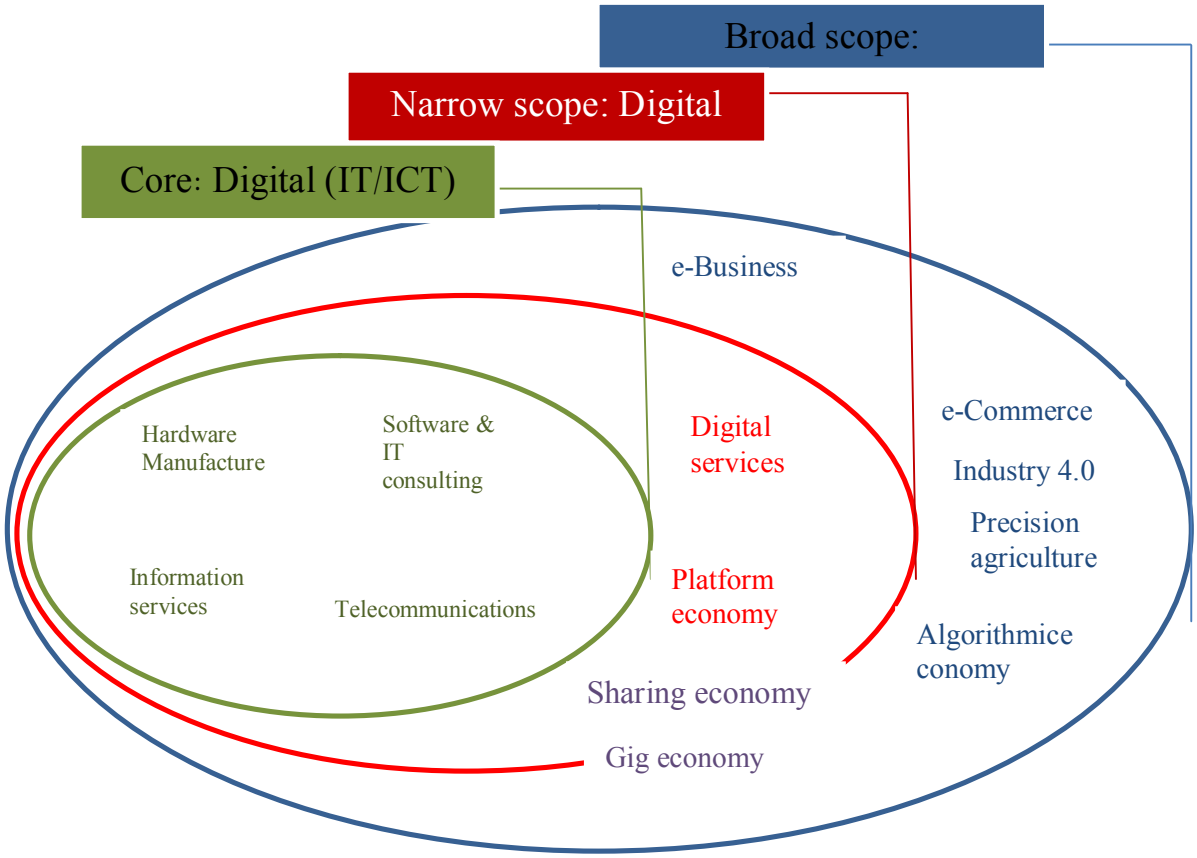
The term "digital economy" refers to the widespread use of IT (hardware, software, applications, and telecommunications) in all facets of the economy, including business, government, and non-profit internal operations, transactions between organizations, and interactions between individuals acting in the capacities of both citizens and consumers and organizations.(Atkinson & Mckay, 2007, p. 07)

And there are others who argue that the economics that deals with digital information, digital consumers and businesses, and digital technology like multimedia and telecommunications is known as the digital economy, or web economy, cellular technology and computing, and digital products (data bases and repositories, software , web books and periodicals, electronic games, and music on the web) as well as physical products with microprocessors and networking capabilities".

It is also defined as: that economy that is based on digital information technology, and uses information and knowledge in its management as the new source of wealth and a source of inspiration for new innovations.(Boudinar & Ramdani, 2021, p. 198)Based on this and the central notion of extensivity, therefore, According to "RumanaBukht& Richard Heeks", the digital economy is "that portion of economic output that is derived solely or primarily from digital technologies and has a business model centered around digital goods or services."

Although the definition's boundaries are hazy, it is sufficiently adaptable to eventually take digital and digital business model innovation into account. Without claiming that all digitized activity is a part of the digital economy, Figure 01 summarizes both the core digital sector and the wider range of extensive digital activity.(Bukhti & Heeks, 2017, p. 13)

Figure 01: Scoping the digital economy



Source:(Bukhti & Heeks, 2017, p. 13)

2.3The characteristics of the digital economy

The main factor in production is knowledge: If the land is the source of production in the agricultural society and money and machines are the source of production in the industrial society, then knowledge is the latest and most important factor of production in the new stage in which man is living, and knowledge workers have become the new capitalists who own the richest and most valuable factors of wealth. (Ben soula, 2018, pp. 338-339) And the most common characteristics of the digital economy can be summarized in the following points: (Rajam & Ben Amara, 2018, p. 02)

- provides information to decision makers.
- In the digital economy, information has become an element of strength.
- The abolition of traditional economic borders and restrictions.
- The digital economy is based on the level of the technological culture of society.
- The main dependence of the Internet in various operations and transactions.
- The emergence of electronic sales, the electronic contract (electronic commerce).
- The digital economy is constantly affected by changes in the information and communication technology sector.
- The emergence of digital globalization.
- The emergence of digital institutions.
- The emergence of the Internet of things (IoT).

2.4The importance of the digital economy and its impact on the business environment

The importance of the digital economy highlights through the role it plays and its advanced technologies in various fields, and the main and important contributions that result in the economy and the performance of its activities that are done in an accelerated and increasing manner, and therefore the importance of integration into this economy is several pointsIncluding the following: (Amani, 2017, pp. 170-171)

Contribute to generating various and increasing job opportunities, especially in areas that use advanced technologies included in this digital economy.

- Contribute to improving performance, raising productivity and reducing production costs.
- Raising the output, national income, increasing projects, and contributing to generating value added to the economy.
- Contribute to finding a new pattern of international specialization and division of labor, as it is linked to various advanced technologies, including e-commerce, virtual markets, e-government and e-management, and e-banking.

3.1 The Digital Economy versus the traditional Economy

The writings of the economists "Drucker and Farian" were credited with defining the parameters of the digital economy, which, despite its modernity, contributed a large percentage to the national product of the most advanced countries, while the participation of traditional sectors such as pastoralism, agriculture and industry in their GDP has diminished.

The new economy differs from the old economy in respects of several factors such as production, consumption, employment, competition and sectoral structure. These differences between the new economy and traditional economy are shown in the following table: (Savrula & Kiliçb, 2011, p. 250)

Differenceelement	TraditionalEconomy	Digital Economy
Production and Competition	National	Global
Area	Hierarchical –	Network
Organizational Structure	Bureaucratic Mass	Full Time Flexible Manufacturing
Production Structure	Production	Innovation, Invention and
Determinants of Growth	Capital, Labour	Information
Factor	Mechanization	Digitalization
Determinants of Technology	Economies of Scale, Low-	Scope Economies, Innovation and
Factor	Cost	Quality
Source of Comparative	Low, Medium	High
Domination	Acting alone	Cooperation, Partnership, Synergy
Importance Given to R&D		and Mergers
Relations With	Full Employment	Higher Real Wages
OtherCompanies	Vocational Diploma	Lifelong Learning
	Stable	Risk and Opportunity
Labour Policy Objectives	Command and Control	Market-Based, Flexible
Required Education	Production-Oriented	Customer Focused
Nature of Employment	Important	Less Important
Regulations	Not Qualified or Expert in	Knowledge, Experience and

Human Capital	a Particular Field	Versatile
Labour	Relatively Tangible Assets	Skills, Innovative and Creative
Structure of workforce	are Important	Real Tangible Assets
Significance of Assets	Weighted Agriculture and	are more Important
Industry Structure	IndustrySectors	Weighted Service Sector

The most important differences between Digital economics and traditional economics can be summarized as follows:

- Transaction costs vary between traditional markets and digital markets, as exemplified by the emergence of digital platforms like Amazon, Uber, and Airbnb. These platforms facilitate connections between market participants in a virtual realm, offering optimal prices and fostering trust among unfamiliar individuals through innovative methods(Kosimov & Ruziboyeva, 2022, p. 438)
- The digital economy relies on modern technology and intellectual creativity, while the traditional economy relies on the exploitation of available resources.(faraj & el sayed, 2022, pp. 1445-1446)
- The ownership of knowledge in the digital economy cannot be transferred, in contrast to the traditional economy's factors of production.
- The digital economy is an abundant economy where knowledge is consumed, applied, and disseminated more widely, while the traditional economy is an economy of scarcity, because resources are depleted by consumption.
- The digital economy has created virtual banks that work around the clock, and this is not provided by the traditional economy.
- The production element in the digital economy is knowledge, while the traditional economy is represented by labor and capital.
- Workers in the digital economy use codes and programs more than the machines used by the traditional one.

3.2 The Pillars (fundamentals) of the digital economy

The following are some of the fundamental elements upon which the digital economy is built: (Amani, 2017, pp. 67-68)

- infrastructure and technical equipment: The existence of an infrastructure for information and communication technologies allows the transition to the global economy. Examples of these technologies are: telephone networks, computers and the Internet.
- Providing an organized legal environment to secure fair competition.
- The ability of the financial sector to provide and develop investments and venture capital, in order to support and support new ideas. The financial system, with its institutions and rules regulating work, is an essential and important element of the digital economy due to its ability to allocate resources and use them optimally.
- The real capital represented in the human resources concerned with the education and training sector.
- Research and development: where governments pay great attention to research and development as the basis of technological development, and entering the new economy

requires raising the percentage of spending on research and development projects and increasing spending on everything that would increase the knowledge balance.

- Intellectual property: that is, giving rights to any new knowledge to those who made the effort to create it, in order to provide an incentive to make more efforts, and these rights are represented in patents, trademarks and copyrights.

3.3 The requirements of integration into the digital economy

Certain components are necessary for the digital economy that can be summarized as follows: (Jurayevich & Baxtiyar, 2020, p. 06)

- Modernizing digital infrastructure based on modern requirements.
- Establish “digital production” with the use of technology to ensure product quality and competitiveness in industries and to increase efficiency.
- Creating and maintaining effective small and medium-sized enterprises in the field of digital technologies and platforms and digital services.
- Creation of data centers that provide easy, stable, secure and cost-effective data storage and processing services to the government, businesses and citizens.
- Introduction of digital data platforms to meet the needs of authorities, businesses and citizens.
- Full transition to non-cash (electronic) payments, remote access and other electronic forms of banking and finance activities.
- Ensuring integration of electronic payment systems with the world payment systems.

3.4 The challenges of measuring the Digital Economy

Although measuring the digital economy is a crucial process, it is regarded as flaweddue to some difficulties facing the measurement process, including: (Bukhti & Heeks, 2017, p. 15)

- Define/boundaries: As was previously mentioned, there are many different interpretations of what constitutes the "digital economy." This complicates comparisons but does not in and of itself make measurement challenging. Furthermore, it is challenging to measure definitions that conflate the digital economy with the broader economy.
- Invisibility of the digital economy: a lot of economically driven activities made possible by technology do not always manifest as output. They might serve as intermediary services between companies and consumers; they might be hard to track because they are frequently virtual; they might be challenging to price inputs, making value-added calculations challenging; and they might be difficult to trace in relation to cross-border digital trade and consumers acting as producers online.
- Issues with data quality: At the moment, foundational data problems exist, especially in developing nations, where data is either missing or of low quality. Continuous innovation makes this worse by causing data collection to lag behind the times in terms of technological advancement.

3.5 The indicators for measuring the digital economy

Indicators for measuring the digital eomy include: (El Zarkoushi & Zouha, 2022, p. 140)

- **ICT infrastructure:** The physical aspect (equipment and tools) and the digital aspect (software) of the infrastructure of the digital economy must be measured in terms of its availability and coverage for all regions, as well as the level of Internet services quality and prices compared to the global market.
- **E-Commerce:**An important indicator also for measuring the digital economy through the volume and pattern of electronic transactions between institutions (B2C), And between the enterprise and the consumer (B2B) and the quantity of digital goods and services must be measured.
- **Corporate and Industry Structure:**The impact of improvements in information technology, software and the Internet on the structural composition of companies and markets must be measured in terms of the need to integrate company departments or create new departments such as the data analysis department.
- **Price behavior:**It is one of the indicators of the digital economy. It is possible to measure the adaptation of the factors that lead to the deflation of the prices of goods and services to reflect the extent of the change in quality due to information technology.
- **Demographic and labor characteristics:**The demographic and labor market characteristics of individuals and workers that participate in the digital economy must be measured and compared with those that do not.

However, in order to gauge the growth of the digital economy, the Organization for Economic Co-operation and Development (OECD) created an indicator system that identifies the following patterns:. (Borremans, Zaychenko, & Iliashenko, 2018, p. 03)

1- the emergence of a high-tech economic sector.
2- investment in supplementary retraining, software development, research, and educational costs.
3- Investment in research, software development, education costs and auxiliary retraining.
4- Development and manufacturing of communication and information technology.
5- Creation of research and development zones for advanced technologies.
6- Information about collaboration in science and innovation across national borders; collaboration between corporations, institutions, and research groups.
7- the mechanisms behind the global Internet's diffusion.

4.1 Two application market domains of the digital economy: Industrial and consumer

The digital economy is usefully divided, broadly speaking, into segments for consumer and industrial applications, just like many other markets : (Sturgeon, 2019, p. 04)

Industrial applications (advanced manufacturing/ "industry 4.0"	**Consumer applications (consumer platforms, products and services)**
•Drones, cobots and intelligent robots, and three-dimensional printers (3DP) are examples of modern production equipment that is becoming more affordable and more functional. • Sensor-richnetworked infrastructure and machines.(IIoT), to collect large-scaledata for use in intelligent and autonomouscontrol systems and in enterprise and analyticssoftware • Advanced simulation (e.g., digital twins), augmented and virtual reality • New materials and processes, small highprecision motors and actuators, and nanomanipulation • integration of the four technology domains—manufacturing, logistics, product design, and customer relationship management—that are mentioned below.	•Smart phones and other mobile devices • Social networking • Connected and intelligent home appliances (IoT) • Connectivity and autonomous features in vehicles • Automated and AI-assisted customer service • Ride hailing and delivery services • E-commerce • Etc.

4.2 The applications of the digital economy: E-commerce and Blockchain

Ecommerce

BEA refers to all sales and purchases of goods and services that take place over computer networks as "e-commerce.". E-commerce captures the essence of a product or service transaction. Digitally ordered, digitally delivered, or platform-enabled transactions are all categorized as e-commerce by BEA. These exchanges consist of: (Barefoo, Curtis, & Jolliff, 2018, p. 08)

- **Business-to-business (B2B) e-commerce:**E-commerce is the practice of companies trading goods and services with other companies online or through other electronic channels. In order to produce goods and services for final consumption, manufacturers, wholesalers, and other industries participate in both intrafirm and interfirm e-commerce..
- **Business-to-consumer (B2C) e-commerce:**Retail e-commerce is e-commerce in which companies sell goods and services to customers using the Internet or other electronic channels.
- **Peer-to-peer (P2P) e-commerce:**Platform-enabled e-commerce, or the "sharing" economy, refers to the consumer-to-consumer exchange of goods and services made possible by internet applications. These include, but are not restricted to, food preparation, landscaping, consumer goods rentals, janitorial services, ride dispatching, lodging rentals, delivery and courier services.

4.3 The effects of blockchain on business

Businesses can leverage blockchains in a variety of ways to gain an advantage over their competitors: (Felin & Lakhani, 2018, p. 18)

- It can provide a foundation for powerful applications that will streamline core operations.
- Make intellectual property ownership and payments more transparent, and automated.
- Blockchains can streamline core business.
- Reduce transaction costs.

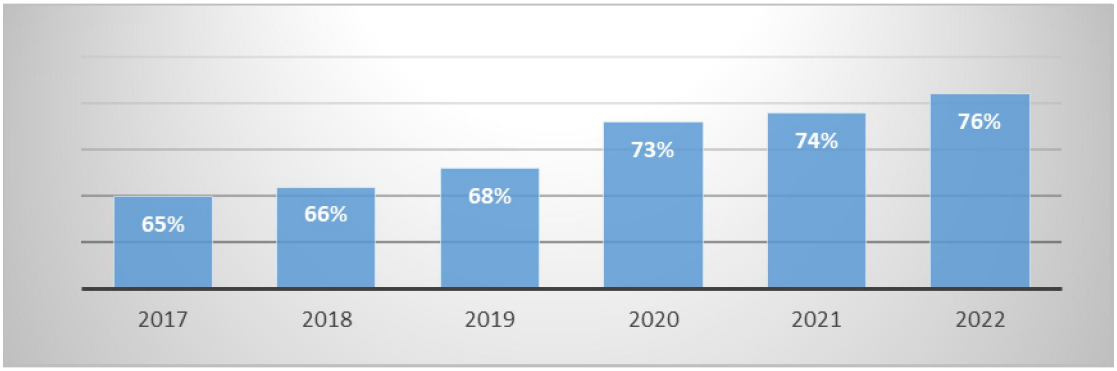
4.4 E-commerce in the European Union

With the global pandemic, e-commerce is becoming more and more entrenched in the economy and society, and these are some figures for 2022 regarding e-commerce in Europe:(Ecommerce Europe, 2022)

- In Europe, the volume of E-commerce keeps increasing: 718 billion euros in 2021 (+13% compared to 2020).
- The European Union of 27 and B2C e-commerce: despite the lifting of measures relating to the global pandemic, and the United Kingdom's exit from the European single market, the turnover of Europe of the 27 increased by 16% in 2021.
- Western Europe (of which France is a part) is the leader on the B2C e-commerce market in Europe: it alone represents 63% of total turnover (450 billion euros in online sales) and is rising on the top step of the podium. The remaining regions in order of ranking are: Northern Europe (9%), Eastern Europe (2%), Central Europe (10%), and Southern Europe (16%).
- Northern Europe has the largest share of online shoppers: 86% of internet users made purchases online in 2021, Western Europe comes in second with 84% and Central Europe third with 75%.
- The lowest percentage of online shoppers is found in Eastern Europe:this area includes a significant number of countries outside the European Union, and has only 46% of Internet users having made purchases online in 2021 .
- The percentage of European online shoppers remains stable: 73% of European online Internet users bought online, compared to 74% in 2020. This percentageisexpected to increasein 2022 to reach 75%.
- The 3 countries with the highest percentage of e-shoppers: the Netherlands (94%), Denmark (92%) and Norway (92%).
- The percentage of online shoppers in France remains higher than the European average: in 2021, 82% of French Internet users have already purchased online. In the European ranking, France is in 11th position, tied with Germany and Luxembourg.
- The percentage of cybershoppers in France should continue to increase in 2022: according to estimates, 84% of French Internet users should buy online in 2022, i.e. 2% more than in 2021.
- The French are buying more online from French sellers: 80% of French online shoppers have made a purchase from sellers in their country in the last 3 months (data for 2021). In comparison, only 37% of French e-shoppers made an online purchase via sellers from other EU countries.

The following bar chart shows the percentage of internet users that bought goods or services online (E-shoppers)

Figure 02: Percentage of E-shoppers that bought goods or services online in the EU countries



Source: (Ecommerce Europe, 2022)

It is clear from the above graph that the high numbers of E-shoppers was almost a stable pattern between 2017 to 2019 in the European Union, But that changed in 2020, as the E-commerce known a remarkable and qualitative leap, which is due to the spread of the Corona virus, where the people found themselves forced to shop electronically with the availability of products on the Internet, and the situation continued in the year 2021 on the same pattern, especially with the great spread of the virus and the imposition of Curfew by most countries.

In 2022, the rise in e -commerce rates continued,and in addition to the spread of the Corona virus, there was another factor which is the beginning of the Russian -Ukrainian war. From the previous stats and numbers and despite the war in Ukraine, inflation, disruption of global supply chains and a general sense of uncertainty E-commerce in EU continued to grow in 2022 and it appears that this will be the case in coming years.

4.5 Bolckchain applications in the European Union

Numerous academics have talked about using blockchain technology in business. After reviewing these studies, we think the following four areas are where businesses should think about implementing blockchain technology: (Xu, Chen, & Kou, 019, pp. 09-10)

A-Accounting settlement and crowdfunding

Blockchain-enabled virtual currencies like Bitcoin can assist companies in resolving funding-related issues. Cryptocurrencies, for example, help businesses that want to use accounting settlement and non-cash payments. The degree of control over the financial execution of business operations is enhanced by the automation of electronic transaction management accounting, both internally and externally. Furthermore, crowdfunding for venture capital is a new source of funding made possible by blockchain technology. Token sales and initial coin offerings are two ways that entrepreneurs and investors can get alternative funding for their businesses. Blockchain-based digital currencies allow businesses to hold, transfer, and issue money with greater flexibility and control over financial matters.

B-Data storage and sharing

Data is the most valuable resource and is essential to any business. Blockchain technology offers dependable data storage and effective data use. Blockchain is a decentralized, secure ledger that many different types of businesses can use to manage digital assets. Because no one can tamper with data on the blockchain, decentralized data storage means you give the data to people worldwide rather than to a centralized organization. Blockchain technology can be used by businesses to store data, enhance its security and transparency, and stop data manipulation. Additionally, blockchain facilitates data sharing. For example, the major players in the accounting industry use an accountancy blockchain to compile.

C-Supply chain management

Supply chain management could be drastically altered by blockchain technology. Blockchain and Internet of Things adoptions in recent years have improved supply-chain provenance. Essential information is stored in the blockchain during the product's transfer from the manufacturer to the buyer. To efficiently track product quality, businesses can track both finished goods and raw materials.

D- Smart trading

Blockchain technology, which is widely used to implement business collaborations in general and inter-organizational business processes in particular, allows businesses to create smart contracts. Businesses can use smart contracts on blockchains to automate transactions without requiring human confirmation. For example, smart contracts allow businesses to automatically file taxes.

Conclusion

We can say that information technology and knowledge-based economy are producing different products and services in unpredictable values, mention electronic business forms: electronic market; electronic marketing; electronic scholarships; electronic banking transactions; electronic distribution of knowledge and services, and the rise of Without a doubt, the New Digital Economy is changing the dynamics of economic growth. For instance, over the previous 15 years, major advanced economies (like the US, the UK, and Germany) have seen a sharp rise in business spending on digital services like cloud computing, data analysis, and other information services.As the digital economy has reached a new stage of the global economy, as a result of the use of information technology in various economic fields, as happened in all areas of life, as the development of information technology and the use of computer networks to identify sellers, evaluate products and services, compare prices, re-engineer production processes and simplify access to the customer.Also, e-commerce in the European Union allowsthe customers and the enterprises to reach the most remote markets easily, which in result provide the trade volume and profit of both demand and supply side.

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