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The Information Economy in the Age of Digitalization: Key Characteristics, Distinctions and Development Trends

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Abstract

The information economy, which uses knowledge and digital technologies as primary resources, has transformed traditional economic models and practices. Despite its growing significance, there are varying and often conflicting interpretations of the essence and unique features of the information economy. This article aims to explore the theoretical foundations on which the information economy is studied to define its main characteristics. Through an in-depth analysis, a classification of the core characteristics of the modern information economy was established, highlighting its reliance on digital information, knowledge-intensive activities, and network effects. Additionally, based on market data, the study identifies key development trends within the information economy, emphasizing the impacts of increasing digitalization and globalization. These findings provide a comprehensive understanding of the evolving nature of the information economy and its influence on broader economic practices.

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1. Introduction

We live in the so-called "information age," where technology has advanced to a level that allows us to access and obtain knowledge at any time and place of our choosing. The information economy represents a relatively new stage in the development of the global economy and society, where information, knowledge, and digital technologies play a leading role, transforming traditional economic models and practices.

Unlike the classical economy and its accompanying industrial revolution, which was based on producing tangible goods and industrial processes, the information economy focuses on intangible assets and services. Despite its growing significance, various and often contradictory interpretations of the essence and unique characteristics of the information economy exist.

This article aims to explore the theoretical foundations underlying the study of the information economy to define its primary characteristics and highlight how it differs from the industrial economy. Furthermore, the study seeks to examine key trends in the information economy development based on market data, particularly emphasising the impact of increasing digitalisation and globalisation.

2. The Information Economy – Core Characteristics

The information economy began to emerge as early as the late 18th century. Still, it gained greater attention in the late 20th and early 21st centuries with the advent of the Internet and related production technologies. New information and communication technologies, which allow for the creation, processing, and distribution of vast amounts of data and the informatization of socio-economic systems, form the technological structure of the information economy. The technological framework facilitates broader communication and connectivity between economic entities, enhancing the exchange of resources and information (both electronic and real) within society. “The level of development of the contemporary ‘information economy’ is determined by the degree of organization in the exchange of information within society” (Vasilev, 2015). This leads to the intensive and efficient use of existing information to derive new insights, converting it into knowledge and innovation.

Since the inception of the information economy, numerous economists and sociologists have studied its essence and characteristics, thereby developing its theoretical and practical foundations. Various approaches exist for exploring the concept of the information economy and defining its core attributes, leading to different identified characteristics. These distinctions arise from the authors’ interpretations of the subject of the information economy.

The subject of the "information economy" can be considered in a broad and narrow sense. In the narrow sense, the information economy focuses on its primary production resource - information itself and includes the emerging economic relations related to the production, processing, distribution, exchange, storage and consumption of any type of data and information. In a broad sense, the subject of

the information economy is associated with the characteristics and dynamics of the newly formed kind of economy, as well as the socio-economic impacts resulting from its imposition. The information economy faces challenges such as providing universal and generally accessible services, promoting the consumption of information as a good while at the same time overcoming digital inequality, increasing the population's digital literacy, establishing appropriate legal regulations for property rights within the information sphere and enhancing qualifications of workforce in the information sectors (Iliev, 2014).

Some authors, such as Machlup (2014), Giraldo, et al. (2022), and Kuleshov, et al. (2017), portray the information economy as a knowledge economy. In this view, various types of knowledge and information are produced and disseminated to achieve higher economic growth and productivity through investments in human capital development and innovation. Other scholars, including Muminjonovich (2024), Izmaylov, et al. (2018), Śledziewska & Włoch (2021), Litvinenko, et al. (2019), and Xia, et al. (2023), equate the information economy with the digital economy. They associate it with economic activities driven by digital information and communication technologies, emphasizing its virtual, networked nature tied to e-business, e-commerce, and the production and provision of personalized digital goods and services, with transactions often conducted using electronic money. Similarly, Zysman & Weber (2001) and Dzwigol (2019) present the information economy as primarily an electronic and virtual economy, while Amosha, et al. (2021) identify it as a network economy.

The new concept of the information economy, as explored in the works of Porat (1977), Castells (1996), Anie, et al. (2016), Fırat, et al. (2017), Sukhodolov, et al. (2018), Trushkina (2019), Badalzade (2023), and many others, is described as an integral part of the development of the new information society and it is inextricably linked to the emerging socio-economic interactions formed through the exchange and creation of information. The information economy, as defined by these scholars, is an economic system in which intellectual and innovative activities constitute the majority of the gross domestic product and where digital technologies are utilized for the production, processing, storage, exchange, and distribution of information and information products. As a result, the extraction of new knowledge and innovations allows for the effective resolution of a country's socio-economic issues, offers higher value to consumers, and expands connectivity. Information thus becomes a critical competitive advantage and a "driver of globalization in the information society" (Izmaylov, et al. 2018).

Based on the literature on the concept of the information economy discussed above, the following main characteristics can be summarized:

First, information and knowledge are dominant resources and, at the same time, targeted outcomes. Existing information is utilized to create new information that is accessible to a broad audience but protected under intellectual property law. I.e., the emphasis is on intellectual capital, skills and technological know-how, and high-value information products.

Secondly, existing and new information are considered equal. The main criteria for the value of information are not its novelty but rather its accuracy, applicability, and frequency of use. While new information is more accessible, the prevalence of information does not necessarily make it more accurate or of higher value.

Thirdly, it is virtual. Electronic and virtual are the dominant forms of creating, distributing, storing, exchanging, and consuming information. More and more services are moving into the online space. In this way, many people can be included and excluded simultaneously and individually in these processes. Digitalization transforms traditional economic models by implementing digital technologies, such as artificial intelligence, cloud technologies, big data, the Internet of Things, and technological advancements that automate routine tasks and optimize business processes (e-commerce, digital platforms, shared economy).

Fourthly, it is global and network. The information economy utilizes the World Wide Web and technologies that connect markets into a single global market, forming network effects. In this market, geographical barriers are minimized, and information can be shared and used in real-time anywhere in the world due to the openness of the economic system for exchange. In this way, the value of the service increases with the number of users. At the same time, global connectivity facilitates international trade, investment, and cooperation, allowing businesses to reach consumers from any point in the world at minimal costs. Network effects can create significant economies of scale, leading to the emergence of natural monopolies.

Fifthly, innovations and creativity are enhanced through adequate protection of intellectual property. The significance of intangible assets, such as software, patents, copyrights, trademarks, trade secrets, and data, is increasing in the information economy. Intellectual property rights protect these assets, stimulate innovation, and create competitive advantages. Companies often derive significant value from their intellectual property, which can be more valuable than physical assets.

Sixthly, it has a high degree of dynamism, allowing for rapid adaptation to technological changes. The information economy is much more dynamic than the industrial economy, with a high level of innovation and adaptation to new technologies. Businesses must quickly adapt to new technologies, market trends, and consumer demands. This dynamic environment fosters a culture of innovation, entrepreneurship, and continuous learning.

Seventh, it is characterized by low marginal production costs. Information goods differ from traditional ones in that their quantity does not decrease as more consumers use them, and the expenses associated with copying and distributing information are minimal, approaching zero. As a result, the marginal costs are drastically reduced compared to physical goods, where producing each additional unit requires significant resources and expenses.

Eighth, it facilitates the decentralization of economic activities, allowing direct interaction between producers and consumers. Traditional intermediaries, such as physical retailers and wholesalers, are increasingly bypassed by digital platforms, enabling a more efficient and transparent marketplace.

Ninth, it facilitates the personalization of offered products and services, which

sharply contrasts with the standardized, mass-production approach of the industrial economy. Advanced data analytics and artificial intelligence enable businesses to provide highly personalized products and services, tailoring their offerings to individual consumer preferences.

Tenth, information and communication technologies form the technological infrastructure of the information economy, upon which all processes of creating, processing, exchanging, storing, and consuming information in society are based. This necessitates their continuous development and maintenance, as well as the development of specific skills for their use and the qualification of the labour force, in contrast to the industrial economy. For these reasons, new industries that intensively use information and knowledge are emerging, such as software development, biotechnology, finance, education, and media. These sectors are dominant players in the information economy.

Eleventh, the role of services has increased. Services, especially those related to information technology, data management, and digital platforms, play a crucial role in the information economy. Services are often information-intensive and can be delivered remotely, facilitated by digital technologies. The shift from goods to services is evident as economies focus more on providing solutions, experiences, and value-added services rather than solely physical products, as in the industrial economy.

Twelfth, it requires continuous learning and innovation. The speed of change in the information economy also leads to changes in the labour market, necessitating a culture of constant learning and innovation. Organizations must continuously adapt to new technologies and changing market demands, making skills and knowledge crucial for competitiveness. There is an increasing demand for personnel with skills in creative and intellectual activities, such as programming, data analysis, digital marketing, and other specialized digital competencies. At the same time, new and flexible forms of employment are emerging-remote and hybrid work and freelancing.

Thirteenth, the new industries with intensive use of information are factors for high efficiency and economic growth.

3. Distinction of Information Economy from Industrial Economy

While studying and analysing the literature on the formation and development of the concept of the information economy, the main characteristics of the new "information economy," which significantly differs from the industrial economy, were highlighted. Based on this, the following key differences between the information and industrial economies have been systematized (Table 1).

Table 1: Differences Between the Information Economy and the Industrial Economy

Characteristics	Information Economy	Industrial Economy
Key Resources	Intangible - information, data, knowledge, and intellectual property	Tangible - land, physical labour, and capital
Production Process	Non-physical production, i.e., provision of digital and intangible services	Physical production of goods based on industrial processes and machinery
Nature of Goods	Goods are mainly non-rival and non-excludable	Primarily rival and excludable goods
Product Personalization	High levels of personalization are possible, based on insights derived from data	Standardized products, with limited personalization due to mass production techniques
Role of Technology	They are the main driver of economic activity and innovations	Used for automation and improvement of production processes
Production Costs	Low marginal costs for production and distribution, with high initial fixed costs	High production costs and increasing marginal costs
Value Creation	Value is created through generating, analysing, and applying information and it is often subjective	Related to tangible goods and effective distribution of physical resources
Economic Scale and Network Effects	Economies of scale are driven by network effects, where the product's value increases with the number of users. Growth is not necessarily tied to equivalent physical investment	Economies of scale are achieved through increased production volumes and effective resource use. Growth often requires significant capital investments in physical infrastructure
Distribution Channels	Uses digital channels, including e-commerce, social media, and cloud-based services, for immediate access to global markets, digital platforms	Distribution often involves multiple intermediaries and relies on physical channels
Customer Interaction	Interactive and participatory, with continuous feedback through digital platforms allowing direct engagement with consumers	Limited feedback loops with customers, often one-way communication from producer to consumer
Market Structure and Competition	Markets are dominated by digital platforms/tech giants and network effects, often leading to monopoly or oligopoly structures. Characterized by lower barriers for startups but high scaling barriers	Characterized by traditional competition among firms producing similar goods, often with high entry barriers in capital-intensive industries
Role of Labour, Employment, and Skills	Decreasing the role of labour in favour of automation and intellectual capital. Focus on cognitive, creative, and technical skills	Labour is a primary factor of production and is often simple and manual. Emphasis on physical tasks in production
Speed of Innovations and Changes	Rapid, disruptive, and lead to swift and often unpredictable market changes	Typically linked to physical processes and machinery and are relatively slow and predictable
Geographical Impact	Location is less critical, work can be done remotely, and digital products can be delivered globally without physical constraints	Economic activities are often tied to specific locations due to the need for natural resources, factories, and physical distribution networks

Source: Own development

From the table, it can be concluded that the information economy differs from the industrial economy in the following ways: it produces intangible products, primarily information-based products, using information as the primary resource. Interaction with customers is interactive, and the products are personalized and primarily distributed through digital channels. Production is mainly creative, with the newly created value being subjective, and the additional costs for producing each new product unit are low, approaching zero. The economic incentives of the new economy are related to economies of scale driven by network effects, and the activity growth is not necessarily tied to equivalent physical investment. The role of technology has reached a level where it becomes a key factor for growth, while the role of labour decreases in favour of automation. Innovations are rapid and disruptive, often causing unpredictable market changes. The market, in turn, is dominated by large technology giants whose geographical location is not critically important, as remote work is possible, unlike in the industrial economy, where economic activities are carried out in specific geographical locations.

4. Key development trends in the Information Economy – the impact of increasing digitalization and globalization

The information economy is rapidly evolving under the influence of digitalization and globalization. These two forces are changing industries, transforming business models, and rethinking how value is created and distributed worldwide. According to data from www.statista.com [21], several key trends in the development of the information economy can be outlined:

1) **Ongoing Digital Transformation of Business Models** - companies across all sectors utilise digital technologies such as cloud computing, artificial intelligence, and big data analytics to enhance their operations, customer service, and innovation, and this trend is expected to continue growing. In 2023, spending on digital transformation reached $2.15 trillion. By 2027, global spending on digital transformation is anticipated to reach $3.9 trillion.

- **Rise of Cloud Computing and Software as a Service (SaaS)** - cloud technologies have revolutionized business by offering organizations scalable and cost-effective solutions, ranging from data storage to access to computing power, software, and other cloud-related functions, without the need for on-premises hardware or significant initial investments. This enables firms of all sizes to compete on more level playing fields. SaaS products are available to both B2B and B2C customers, unlike IaaS (Infrastructure as a Service) and PaaS (Platform as a Service) products. The SaaS market accounted for approximately two-thirds of the cloud services market in 2023, reaching nearly $197 billion. It is expected to grow to $247 billion by the end of 2024.
- **Increasing Interest in AI Technologies and Automation** - Artificial intelligence (AI) and machine learning are automating routine tasks and enhancing decision-making processes, creating new opportunities for

personalized customer service. AI technologies are transforming industries, reducing costs, and opening new avenues for revenue generation. By early 2024, the AI market is expected to reach $184 billion, marking an impressive growth of 27% compared to 2023. This remarkable growth is anticipated to continue over the next decade, with projections indicating that the market could reach $826 billion by 2030. Steady growth is expected globally across all subsectors of AI technologies by 2030:

- *The Machine Learning Market* exceeded $150 billion in 2023. By 2030, it is expected to maintain stable and consistent growth, adding approximately $50 billion annually, potentially reaching nearly $500 billion.
- *Natural Language Processing (NLP) Market* is projected to grow to over $60 billion by 2030. In comparison, the natural language processing market reached over $23 billion in 2023.
- *Autonomous and Sensor Technology Market* is expected to grow to nearly $60 billion, having reached $20 billion in 2023.
- *Computer Vision Market* is anticipated to grow to almost $50 billion, with a valuation of $20 billion in 2023.
- *AI Robotics Market* is expected to exceed $35 billion. By 2024, the market is projected to have grown by 30% compared to 2023, reaching over $19 billion.

- **Unleashing Data Potential and Data-Driven Decision Making** - the vast data generated from digital interactions enables companies to make more informed decisions. IoT technologies are leading to a more significant proliferation of smart objects with enhanced connectivity and the capability for real-time data collection. The adoption and commercialization of 5G technology (with a 59% penetration rate in 2023) has further increased connectivity and facilitated the deployment of cellular IoT modules. By 2027, the penetration of 5G smartphones is projected to exceed 82%. As a result, the number of IoT devices worldwide is expected to reach nearly 30 billion by 2030. The widespread integration of IoT devices into various aspects of life allows for improved data-driven decision-making and innovation in addressing complex challenges. This data-centric approach is crucial for maintaining competitiveness in the information economy.

2) **The Rise of the Platform Economy (PaaS) -** the platform economy, characterized by digital platforms directly connecting producers and consumers, is another transformative trend. PaaS accounts for 20% of the total cloud services market, with revenues exceeding $145 billion in 2023. The leading players in the global PaaS market that have "disrupted" traditional industries include Microsoft Azure, Amazon Web Services, IBM Cloud and Google Cloud Platform. Businesses are increasingly adopting cloud solutions, and more consumers are using and planning to use the digital platforms offered by these companies. This trend indicates continuous growth and innovation within the PaaS market.

- **Expansion of Network Effects and Market Dominance** - platforms leverage network effects, where the value of the service increases as the number of users grows. As of June 2024, the global number of internet users has reached 5.44 billion. Easier access to computers, modernization and improvements in digital infrastructure worldwide, and the continually decreasing prices of smartphones have enabled people to use the internet more frequently and conveniently. By 2023, there were nearly 1.5 billion fixed broadband subscriptions worldwide, with Europe leading in broadband penetration at approximately 36 subscriptions per 100 residents. As of early 2024, mobile internet was accessible to nearly 70% of the world's population (2.17 billion of which are 5G mobile subscriptions), with leaders in Northern Europe and North America having over 97% coverage. All of this has led to increasing connectivity among the global online audience, which is growing steadily. The total number of internet users is projected to continue rising, expected to reach 7.3 billion users by 2029. The growing number of users creates conditions for expanding network effects and the emergence of dominant players who can capitalize on them. Examples of such giants include Amazon, Alibaba, Uber, and Airbnb.
- **Rise of the Gig Economy and Flexible Employment** - platformization is transforming the labour market, enabling freelance work and on-demand hiring. Many creative industries, as well as those related to various consulting services (insurance, finance, etc.) and transportation, have transitioned or are considering transitioning to digital labour platforms. The COVID-19 pandemic accelerated this trend. The share of remote employees increased to approximately 28% by the end of 2023, compared to just 13% in 2020. The technology sector has the highest proportion of remote workers globally, with over 67% of tech employees worldwide working either entirely or predominantly remotely in 2023. According to the European Commission, the number of platform workers in the EU is expected to reach 43 million by 2025. Remote and hybrid work allows employees to have flexible schedules and lifestyles from anywhere. Despite challenges regarding job stability and workers' rights, this form of employment is becoming the preferred work structure for more employees worldwide (91% of remote workers report that they choose either fully remote or hybrid working arrangements, favouring remote work).
- **Innovation Ecosystems** - platforms also serve as ecosystems that foster innovation by providing developers and entrepreneurs access to a broad user base and data. These platforms further facilitate access to financial instruments, consulting services, real-time environments for testing products and services, and more. This openness stimulates the creation of new products and services, as well as new business models, supporting economic growth and competitiveness.

3) **Increasing Globalization of Digital Markets** - the growing digitalization and connectivity have significantly accelerated the globalization of markets. Businesses now have the opportunity to quickly reach international customers and participate in the global market through cross-border e-commerce, digital payment systems, and virtual services.

- **Expansion of the E-commerce/M-commerce and Global Commerce Market** - the emergence and development of e-commerce platforms enable businesses of various sizes to access global markets and expand consumer choice. The most popular social platform used by merchants in 2024 is Facebook, followed by Instagram and LinkedIn. B2C professionals prioritize Facebook and Instagram, while B2B marketers focus their efforts on LinkedIn, as it connects people and companies in a corporate context. Some benefits these platforms provide include increased exposure, higher traffic, and the opportunity to attract new customers. Consequently, online shopping has gained popularity recently, with e-commerce accounting for over 19% of global retail sales in 2023. It is expected to exceed USD 7 trillion by 2025 and to constitute nearly a quarter of total global retail sales by 2027. Leading e-commerce markets worldwide are in Asia, primarily China, projected to grow by over 14% annually through 2027. The Asian market is followed by Latin America, which is also expected to experience rapid growth in the coming years, given the continuously improving online access, particularly in mobile internet communities. In 2023, revenues from mobile e-commerce reached approximately USD 1.7 trillion (about 50% of e-commerce). The share of mobile devices is expected to increase steadily, reaching 63% by 2028.
- **Expansion of Digital Services and Remote Work** - the development of artificial intelligence, digital transformation, and platformization is broadening the global scope of digital services and driving growth in the IT services market. Businesses strive to implement AI technologies, enhance analytics, and automate processes while taking advantage of IoT capabilities while continuing to prioritize digital transformation. The segment of the IT services market related to IT consulting and implementation is expected to grow steadily, reaching USD 92.95 billion by 2029. This growth is also associated with changes in the labour market. As previously mentioned, digital and hybrid forms of work are becoming increasingly preferred, particularly in the IT industries. Consequently, remote work and online collaboration tools will enable companies to tap into global talent, transforming labour markets and contributing to the rise of digital nomadism.
- **Growth of Cross-Border Data Flows** - data has become an essential resource for the development of the global economy. Businesses increasingly rely on data-driven services that transcend national borders. The volume of cross-border data stored on the internet is expected to reach 175 zettabytes by 2025, with half

of it stored in cloud environments. The growth of cross-border data flows enables improvements in national economies and living standards and raises concerns regarding data trust and privacy, digital sovereignty, and regulatory compliance across different jurisdictions. At the national level, investments in building national data spaces are expected to increase, along with establishing standards for data exchange, best practices, governance tools, and mechanisms to achieve operational compatibility among available public data and information systems. At the micro level, businesses are increasingly seeking modern solutions for networking, storage, and databases. In the future, corporate spending on cloud infrastructure services and data centres is expected to rise, which amounted to USD 270 billion in 2023, representing a 20% increase compared to 2022.

4) **Cybersecurity and Data Protection** - the increasing digitization has led to a rise in cross-border data flows and the growing vulnerability of businesses to cyber threats. Breaches related to trust and data privacy, as well as digital espionage, pose significant risks for businesses and consumers. Consequently, cybersecurity has become a critical issue for the information economy. Key trends related to cybersecurity include:

- **Increase in Cybersecurity Investments** - companies are forced to implement more robust cybersecurity measures to protect their data and systems, which are increasingly moving to the cloud. There is a growing need for investment in enhancing the infrastructure of their information technology systems. To ensure data security, next-generation security technologies that provide integrated security solutions are expected to be a key investment area. Global spending on information security reached nearly $200 billion in 2023. A significant portion of this spending is allocated to security services (approximately $90 billion), followed by investments in infrastructure protection and network security equipment. The global managed security services (MSS) market is projected to grow, reaching $65.53 billion by 2028, compared to $31 billion in 2023. Additionally, the global market for information security technologies is expected to continue its growth, potentially becoming three times larger by 2030 compared to its size in 2017. The global Security as a Service (SECaaS) market is also forecasted to exceed $81 billion by 2032. These trends underscore the increasing recognition of cybersecurity as a critical investment for safeguarding business assets and ensuring compliance in an evolving threat landscape.
- **Creation of New and Improvement of Existing Regulations and Compliance** - governments worldwide are implementing regulations to protect personal data and ensure cybersecurity. Regulations such as the General Data Protection Regulation (GDPR) in the European Union and the California Consumer Privacy Act (CCPA) set standards for data protection that affect how companies handle consumer data. It is also essential to continually develop, adapt, and enforce new compliance regulations at the national level and on a

global scale. This ongoing evolution of regulatory frameworks is crucial for addressing emerging data privacy and security challenges, fostering consumer trust, and ensuring that businesses remain compliant in a rapidly changing digital landscape.

- **Rise of BaaS (Blockchain-as-a-Service) for Establishing Trust and Digital Identity** - the increase in cross-border data flows and digital payment transactions for e-commerce globally highlights the importance of establishing trust online. In 2023, global losses from e-commerce fraud reached approximately $48 billion. As a result, there is a growing demand for cloud-based solutions and mechanisms for verifying digital identities using blockchain technology. Additionally, governments are expected to implement regulatory frameworks for developing and applying AI-based technologies aligned with established legal and ethical principles within the EU. The adoption and implementation of BaaS are on the rise, enabling SMEs to utilize this technology in their global supply chain operations without the need to build and maintain their blockchain infrastructure. The market value of blockchain technology is estimated to reach $26.91 billion in 2024, with projections indicating astonishing growth to nearly $1,880 billion by 2034.

5) **Ongoing Digital Inequality and Challenges for Inclusive Growth** - digitalization and globalization create numerous business opportunities but simultaneously deepen inequalities within and between countries. Digital inequality, defined as the gap between those with access to digital technologies and those without, remains a significant barrier to inclusive growth.

- **Access to Technology** - many regions, particularly in developing countries, still lack access to reliable internet connections, affordable digital devices, and digital literacy programs. As of July 2024, nearly 1 billion people in South Asia have never used the Internet. Despite India and China having the most significant online audiences in the world, they also lead in the number of people who remain unconnected. East Asia follows with nearly 370 million offline individuals. North Korea has the highest percentage of its population without internet access, as only a tiny segment of society can connect, while the rest face restrictions. Additionally, 364.3 million people in East Africa report never using the Internet as of July 2024, and 260 million in West Africa are similarly unconnected. In South Sudan, almost 93% of the population lacks internet access; in Somalia, the figure is around 90%. In contrast, the European region shows the best connectivity compared to other areas. Only 2.7 million people in Northern Europe lack internet access, while Western and Southern Europe average around 10 million each, and Eastern Europe has approximately 33.5 million unconnected individuals. This disconnection hinders the participation of these people and regions in the information economy and limits their economic and social development.

- **Skills Gap** - rapid technological changes demand a workforce equipped with new skills, particularly in areas such as programming, data analysis, and digital marketing. Governments and businesses must address these challenges by investing in education and training programs. This can be achieved through initiatives that promote digital inclusion, such as investing in digital infrastructure, encouraging public-private partnerships, and ensuring equal access to education and lifelong learning opportunities.

6) **Greater Resilience and Green Information Economy** - the information economy is evolving toward greater sustainability, driven by both regulatory pressures and consumer demand. Digitalization offers opportunities to reduce carbon footprints, improve resource efficiency, and promote the principles of a circular economy. The global market size for green technologies and sustainability is projected to reach $19.76 billion by 2024 and is expected to grow to $89.97 billion by 2032 (Report ID: GMI6743 [22]).

- **Growing Use of Intelligent Green Technologies for Sustainability** - IoT, AI, digital twins, and blockchain are increasingly utilised to monitor and reduce energy consumption, optimise supply chains, and manage resources more efficiently. Smart cities, sustainable agriculture, green construction, and ecological logistics are prime examples of digitalisation supporting environmental goals. According to Future Market Insights in their report on the Green Technology and Sustainability Market Outlook (2022-2032) [23], **the share of cloud computing technology for carbon management** is expected to increase significantly over the next decade. Platforms facilitating carbon trading, emissions reporting, and sustainable investments are becoming increasingly important, allowing businesses to accurately track their carbon emissions and implement strategies to mitigate their environmental impact. The Asia-Pacific market is projected to grow the fastest in green technologies and sustainability by 2032, with significant economic players like China, Japan, Taiwan, India, and South Korea making substantial contributions to low-carbon renewable energy development programs. Europe is anticipated to be the second-largest market, driven by vital government initiatives focusing on low-carbon technological innovations.
- **Increasing Consumer Demand for Sustainable Products** - as consumer awareness rises, there is a growing demand for transparency and sustainability in the digital marketplace. Companies are leveraging digital tools to provide information about the environmental impact of their products, enhancing their appeal to environmentally conscious consumers. A recent survey by PwC, titled 2024 Voice of the Consumer Survey [24], which explored the perspectives of over 20,000 consumers from 31 countries and territories, found that nearly nine out of ten (85%) consumers experience the devastating effects of climate change in their daily lives. As a result, they prioritise sustainability in their purchasing

practices, willing to spend an average of 9.7% more on sustainably produced or sourced goods. Additionally, around 35% of consumers actively try to travel less or use alternative transportation, reduce their overall consumption, and support local suppliers. Nearly 40% of respondents assess manufacturers based on their sustainability practices, such as recycling, using eco-friendly packaging, and conserving natural resources and water. This shift in consumer behaviour indicates a significant trend towards sustainability.

5. Conclusion

The information economy, driven by digitisation, is changing the basic principles of economic activity, creating new opportunities and challenges. Unlike the industrial economy, which relies on physical production and raw materials, the information economy produces primarily intangible products and relies on digitisation and rapid, disruptive innovation. Its main characteristics include information as a dominant resource and target result, digitalisation and globalisation of processes, transformation of business models and the labour market. The information economy is global, virtual and network in nature, allowing the internal and external exchange of information; it facilitates the decentralisation of economic activities, allowing direct interaction between producers and consumers on this base personalisation. Understanding these processes is critical to successfully navigating the modern economic environment and a high degree of dynamism and adaptation to future changes.

The information economy is developing rapidly due to digitisation, globalisation, and changing industries and business models. Key global trends include the ongoing digital transformation of business models based on unleashing the potential of data, as well as the rise of cloud computing and growing interest in AI technologies and automation; the rise of the platform economy and freelancers and the expansion of network effects and market dominance; increasing globalisation of digital markets, by expanding the market of e-commerce/m-commerce and global commerce and the scope of digital services and remote work. However, these trends also present significant challenges, including cybersecurity and privacy risks, the digital divide, the need for investment in continuing education for digital inclusion and the need for sustainable and green development. Navigating these dynamics will require businesses, governments and society to adapt continually, ensuring that the benefits of the information economy are widely shared and that risks are effectively managed.

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