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DIGITAL INCLUSION AS A TOOL TO OVERCOME ECONOMIC INEQUALITY IN THE CONTEXT OF DIGITAL TRANSFORMATION

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Abstract

In the article explores digital inclusion as a key tool for overcoming economic inequalities in the context of digital transformation. Examples of international initiatives that demonstrate the practical implementation of digital inclusion policies, in particular programs in Singapore, Great Britain, USA. The importance of intersectoral cooperation between the state, business, civil society and themselves citizens in creating an inclusive digital space. The article emphasizes the importance of the need for a holistic digital policy as a prerequisite for a fair socio-economic development. Particular attention is paid to practical applications for the effective implementation of digital initiatives in a global context.

Keywords: digital inclusion; digitalization; digital transformation; digital divide; digital inequality; public sector; digital initiatives; digital literacy.

ЦИФРОВА ІНКЛЮЗІЯ ЯК ІНСТРУМЕНТ ПОДОЛАННЯ ЕКОНОМІЧНОЇ НЕРІВНОСТІ В УМОВАХ ЦИФРОВОЇ ТРАНСФОРМАЦІЇ

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Анотація. У статті досліджено цифрову інклюзію як ключовий інструмент подолання економічної нерівності в умовах цифрової трансформації. Розглянуто приклади міжнародних ініціатив, які демонструють практичну реалізацію політик цифрової інклюзії, зокрема програми в Сінгапурі, Великій Британії, США. Наголошено на важливості міжсекторальної співпраці між державою, бізнесом, громадянським суспільством та самими громадянами у створенні інклюзивного цифрового простору. Стаття акцентує увагу на необхідності цілісної цифрової політики як передумови справедливого соціально-економічного розвитку. Особлива увага приділяється практичним прикладам ефективної реалізації цифрових ініціатив у глобальному контексті.

Ключові слова: цифрова інклюзія; цифровізація; цифрова трансформація; цифровий розрив; цифрова нерівність; державний сектор; цифрові ініціативи; цифрова грамотність

Introduction. The growing role of digital technologies in daily life necessitates a deep study of the theoretical and practical aspects of digital accessibility. Digital inclusion is designed to be an effective tool for overcoming challenges, providing equal access to the opportunities of the digital environment for everyone without exception. However, in practice, its implementation faces a number of systemic, institutional, cultural and infrastructure obstacles. This actualizes the need for in-depth research into mechanisms for achieving digital inclusion, identifying factors that limit its development, and shaping holistic policies that can reduce the digital divide and promote an equitable digital transition.

The aim of the work is to explore the role of digital inclusion as a tool to overcome economic inequality in the context of digital transformation. We will analyze the main barriers to digital inclusion, and outline the mechanisms that promote greater participation of different social groups in the digital environment.

Research results and their discussion. Shvets [17] notes in his study that since the early 2000s, with the increasing use of computers and the Internet, there has been concern about digital equality, which has been associated with physical access to technology. This concern led to the concept of the digital divide, which was originally designed to describe the growing difference in Internet access between rural and urban areas. Spanel-Juhta [14], Egorov [19], Ivanchenko [9] concluded that bridging the digital divide are key issues on the path to a more just and equal society. Providing access to digital technologies and skills to use them will help all citizens use and develop new opportunities and take an active part in today's digital world. Davydenko [3] notes that digital technologies are becoming not only a means of personal communication, but also a driving force for economic growth. Digital tools allow individuals to communicate and interact with each other without geographic boundaries.

Result

In today's globalized world, digital inclusion is of particular importance as a key factor in the development of civil society and the formation of global unity. Ensuring equal digital access for all citizens – regardless of social status, physical condition or level of technological awareness – is a prerequisite for creating a truly inclusive information space. This approach involves large-scale digitalization and automation of social services in order to provide a technologically accessible environment for everyone. It forms the foundation for an inclusive society of the future. Digital tools give citizens access to a variety of sources of knowledge and information – news, analytics, educational resources, multimedia and alternative content. This contributes to making informed decisions, developing critical thinking and expanding the worldview.

With the growth and expansion of digital applications, digital inclusion is rapidly becoming a critical foundation for economic and social progress, as well as the empowerment of individuals and communities. There are many possible definitions of the broad concept of digital inclusion.

The concept of "digital inclusion" is multifaceted and is widely discussed in scientific, educational and managerial literature. In different sources and among different authors, it is interpreted differently, which indicates the complexity of this phenomenon and its interdisciplinary nature. Some researchers focus on providing citizens with basic access to the digital environment, including the Internet, digital devices and the necessary skills. Others see digital inclusion in the context of the educational process, emphasizing equal opportunities for educational applicants through digital tools. There are also approaches linking digital inclusion with overcoming digital inequality and the formation of socially oriented solutions

that take into account the individual needs of citizens in the digital space. According to various studies:

1) Digital inclusion is defined as the ability of citizens to participate in a digital society. This includes access to the internet, digital skills and participation in the virtual space. Key aspects of digital inclusion include the availability and affordability of technology, education and skills, and participation in digital services [19].

2) Digital inclusion is the process of including all applicants for education in the educational process through digital technologies, ensuring equal access to educational materials, resources and methods [9].

3) Digital inclusion-related concepts include the digital divide, digital alienation, and digital inequality, but digital inclusion focuses more on the strategies, policies, and programs needed to bridge the digital divide [1717].

4) Digital inclusion is a solution that takes into account the individual characteristics of people and creates equal opportunities for attracting people and creates equal opportunities for everyone in the digital world [14].

In this context, digital inclusion appears not only as a technical or infrastructural category, but as a social process aimed at ensuring the active and equal participation of all members of society in digital life.

In the scientific literature, the concepts of digital inclusion, digital inequality and the digital divide are often used as interrelated, but they have different accents. Digital inclusion is a proactive approach aimed at ensuring equal access of all citizens to digital technologies, development of digital skills and full participation in digital society [16]. Its goal is to create conditions in which no one stays away from digital transformation, regardless of age, income or place of residence.

Instead, the digital inequality and the digital divide point to existing barriers. Digital inequality encompasses differences in the level of access and use of technology between different social groups. The digital divide (or digital exclusivity) is an extreme manifestation of such inequality, when part of the population does not have access to the Internet or digital services at all [4]. In this context, digital inclusion is seen as a key tool to bridge these gaps.

The most significant digitalization of the economy depends on universal access to digital infrastructure, resources and skills. In an increasingly interconnected global market, the competitiveness of nations is closely linked to their digital readiness and innovation potential. The experience of many countries and cities demonstrates that the introduction of digital technologies contributes to economic growth, promotes entrepreneurship and pushes

countries to greater macroeconomic competitiveness.

In Indonesia, for example, digital inclusion has proven to be a driving force behind the development of micro, small and medium enterprises at both the national and provincial level. Digital inclusion has also become a key element in the broader economic transformation strategy of the United Arab Emirates. In Estonia, inclusive digitalization has proven to be economically useful both directly in terms of the development of small and medium-sized enterprises and startups.

Table 1 presents five key methodological approaches that form the basis of technological digital inclusion. These approaches cover both the infrastructural and socio-educational aspects of digital inclusion – from needs assessment to adapting digital solutions to user diversity.

Table 1

Main methodological approaches on the way to technological digital inclusion

Approach	Essence	Expected result	Implementation
Needs Assessment	Identifying the needs of specific target groups in the context of the overall population	Understanding the socio-economic environment, level of education, physical capabilities and other factors affecting digital interaction	Study of the digital needs of older people in Ukraine (Eastern Europe Foundation) [7]; Ofcom (UK) – authority to enforce ethical standards [12].
Infrastructure development	Creating an accessible and high-quality digital environment to support inclusiveness	Completion of digital infrastructure (Internet, devices, coverage) that will provide all citizens with stable access to technology	Loon LLC [18] is a subsidiary of Alphabet Inc. that aims to provide Internet access to residents of rural and remote areas
Permanent training and education	Integration of technologies into formal and non-formal education systems with an emphasis on the development of digital skills	Increasing digital literacy, developing adaptive thinking, the ability to use technology in everyday life	Digital Skills Partnership [6] – this partnership aims to improve digital skills for people and organisations
Design for diversity	Development of technologies taking into account the individual characteristics of users (age, disability, language, etc.)	Increasing the inclusiveness of decisions due to their compliance with the needs of different groups of the population, in particular people with disabilities	Apple VoiceOver, Microsoft Narrator, Google TalkBack – built-in accessibility tools

Access to technology	Provide physical and financial access to digital devices and services	Removing barriers to the use of technology through accessibility (cost, language, interface), reducing digital inequality	Everyone On (USA) [8] – a holistic approach to digital inclusion provides access to accessible internet and computers for low-income communities, educates individuals and organizations on digital skills and resources, and promotes fair and legal policies
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Source: compiled by the authors according to the data: [3; 8; 6; 18; 7;12]

As of 2022, the world's population has surpassed the 8 billion mark and reached 8.01 billion in early 2023. More than 57% of people on the planet live in urban areas. At the beginning of 2023, 5.44 billion people used mobile phones, which is approximately 68% of the total population. During the year, the number of unique users of mobile devices increased by more than 3%, that is, another 168 million people were added. The number of Internet users in the world now stands at 5.16 billion, which corresponds to 64.4% of the total population. During the year, this number increased by 1.9% [5].

Based on the data presented in Figure 1, it is possible to trace a clear age differentiation in the level of Internet penetration among the adult population on the example of the United States from 2014 to 2023.

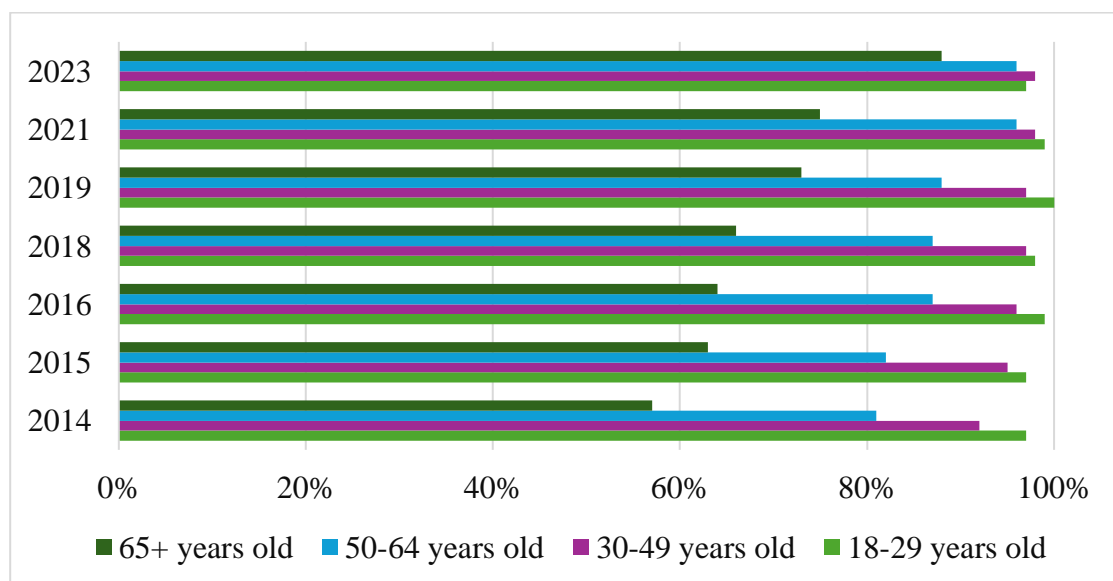


Figure 1. Internet penetration among adults in the United States from 2014 to 2023 by age group

Source: compiled from data [1]

The highest rates of access to the network are demonstrated by younger age groups, in particular those aged 18-29 years and 30-49 years, who consistently have the highest level of digital engagement – almost complete. At the same time, the lowest level of Internet penetration is observed among people aged 65 + years, although in this category there is a gradual increase.

These trends indicate the existence of a digital divide between generations and highlight the need to implement targeted digital inclusion strategies for older people. Providing access to digital technologies, developing appropriate infrastructure, adapting digital services to the needs of the elderly, as well as training programs [11; 15] are key tools to overcome age-related digital inequality. Only with equal digital inclusion of all age categories is it possible to form a truly inclusive information society.

Ensuring digital inclusion, in particular, is hindered by:

- insufficient development of related infrastructure for connection;
- economic inaccessibility of digital solutions for the poor;
- limited adaptation of digital technologies to the needs of persons with special needs;
- low level of financial awareness among socially vulnerable groups;
- speech interference, etc.

Lack of infrastructure (including access to the Internet, electricity or mobile coverage) can significantly limit digital participation even in cases where households already have technical means – computers or smartphones. Without a stable Internet connection or the possibility of constant charging, these devices become practically ineffective. This challenge is especially relevant for countries with a low level of development, but also affects the countryside and remote regions of economically developed countries.

Even with the appropriate infrastructure, the financial factor remains a barrier: for households with low incomes, the cost of purchasing digital devices or paying for Internet access services can be prohibitive.

The issue of inclusiveness of digital products for persons with special needs deserves special attention. Websites, services and applications are often not adapted for people with visual or hearing impairments: there are no alternative text descriptions, subtitles or the ability to scale fonts. This greatly limits the involvement of such users in the digital environment.

Additional complexity creates language barriers. Most online content is published in English, which automatically puts non-English users in a less advantageous position [**Error! Reference source not found.**]. Uneven language access to digital resources exacerbates information inequality, especially in countries with low English proficiency.

One of the most striking examples of public policy aimed at expanding digital inclusion in order to reduce socio-economic inequalities is Singapore's Digital Skills for Life (DSL) programme [2]. Initiated in 2024 by the Information Media Development Authority (IMDA), it aims to provide all citizens, regardless of age and social status, with the basic skills to fully participate in a digital society.

Five core digital competencies under the DSL launched by IMDA in January 2024:

- 1) Setting up and using smart devices, how to manage basic functions on devices.
- 2) Search for information on the Internet. Through the Internet, Singaporeans have access to an unlimited amount of information and new opportunities, but they need to know how to safely search, view and receive this information for constructive use.
- 3) Communicate with other people online.
- 4) Making online transactions for greater convenience, for example, access to banking and public services, making an appointment with a doctor.
- 5) The most important thing is to be safe, smart and kind on the Internet - to understand how to protect yourself from fraud and false information, as well as how to create a positive online presence.

Thus, DSL is an example of an effective national practice of digital inclusion, which not only provides practical tools for everyday life, but also helps to reduce the digital gap among socially vulnerable categories of the population, ensuring equal access to the resources of the digital economy.

Figure 2. the concept of digital inclusion in a dynamic world is illustrated as a multi-level system covering both goals and tools for achieving them. It reflects the key components that form effective digital inclusion – from the basic conditions for access to technology to the active participation of citizens in the digital economy and public life.

At the center of the concept is full, conscious and large-scale participation in digital activities, which is considered as a strategic goal of digital inclusion. Achieving this goal is based on fundamental principles: availability of equipment and connectivity, development of digital skills, trust in the digital environment, participation in public life and adaptability to contextual conditions.

The concept also emphasizes the importance of intersectoral interaction between the public sector, population, business and civil society, which together form the ecosystem of digital inclusion in a constantly changing macro environment.

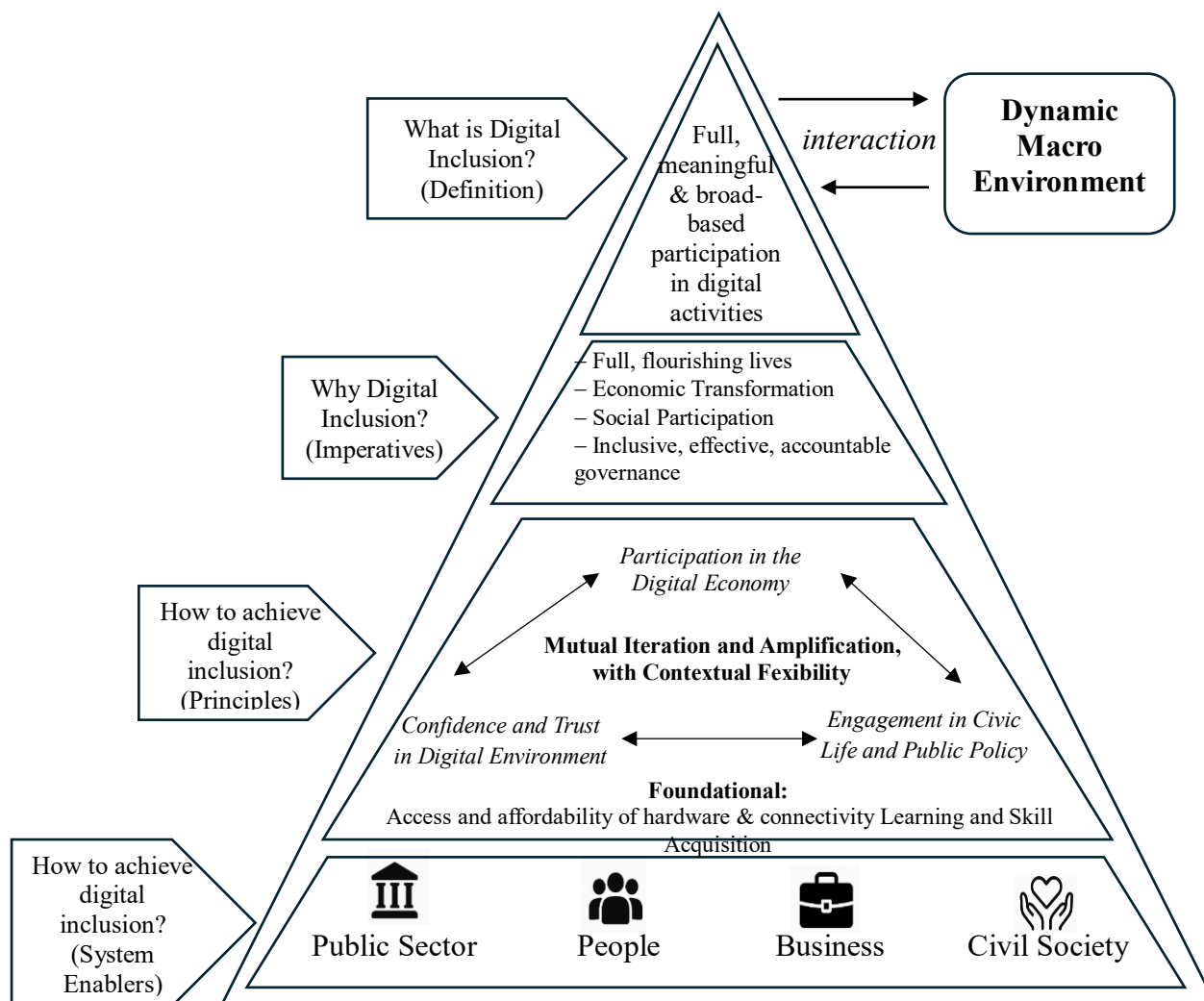


Fig. 2. The concept of digital inclusion in a dynamic world

Source: [9].

Strong public sector institutional levers play a key role in promoting digital inclusion as a strategic priority. Through coordinated action to strengthen these levers, governments can maximize the potential of digital technologies to stimulate economic development, empower citizens, reduce social inequality, and respond effectively to the challenges of global instability.

Such a holistic approach is especially important in the face of the growing complexity of cross-sectoral problems – in particular, the growth of public debt, demographic aging, the transformation of forms of poverty and climate change. All this creates a new reality that requires governments to do better with limited resources. At the same time, government action alone is not enough - the active participation of citizens, businesses and civil society institutions is critical to the development and implementation of effective digital solutions. Thus, digital initiatives must be inclusive, multilevel and intersectoral in nature.

In most cases, only government intervention is necessary but not sufficient; Empowered people, businesses, and civil society play equally important roles as developers and solution providers.

Conclusion

In an increasingly digitized world, achieving digital inclusion is increasingly necessary to ensure equitable access to life opportunities, resources and services for all members of society. Digital inclusion is closely intertwined with key global trends at the macro level and emphasizes the collaborative efforts required by governments, companies, people and civil society organizations.

The concept of digital inclusion went beyond simple physical and financial access to technology and covered broader topics of digital literacy, trust and confidence. The dynamic nature of technology and its impact underscore the importance of countries constantly adapting strategies to meet new challenges and seize opportunities in the digital realm.

The public sector plays a key role as a means of digital engagement. By formulating clear strategies and commitments, creating a solid architecture for cooperation, as governments play a number of roles in regulation, development and facilitation, the government can move closer to bridging the digital divide. Such effective governance and strategic investments help public sector institutions create an enabling environment to promote digital inclusion in diverse communities.

Consequently, digital initiatives for society come in many forms, including infrastructure and access, education and training, public and social support. But only in synergy can these initiatives help create a fairer society whose members are in proactive, practically oriented bonds.

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