

The Impact of Digital Inequality on IT Identity in the Light of Inequalities in Internet Access

Abstract

This article investigates the relationship between the United Nations Sustainable Development Goals (SDG) and Internet access, focusing on how digital connectivity influences the achievement of these global objectives. This research examines digital inequalities in access, usage, skills and outcomes through a mixed-methods approach, including statistical analysis and case studies. The findings indicate a strong correlation between Internet access and progression towards the European sustainability goals related to education quality, gender equality and industry innovation. In particular, it can be shown that where Internet access indicators are lower, digital literacy and IT identity scores are also lower for society as a whole, impacting both the quality of education and social mobility, while simultaneously reducing the economic competitiveness of the respective state. We can also see that these societies have a more patriarchal approach, negatively impacting the social status of women (although the COVID-19 epidemic negatively impacted social resilience, too) while further harming progress towards the Sustainable Development Goal associated with education. Significant disparities are also identified, particularly affecting rural areas, women, children and marginalised communities. The article further explores IT identity, revealing that a strong IT identity enhances digital inclusion and empowerment. Article results highlight the necessity of addressing digital inequalities to ensure the equitable

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distribution of digital benefits and advocating for Internet access as a fundamental right essential to achieving global sustainability and Internet equality.

Keywords: technology inequality, digital inequality, IT identity, human rights to Internet access, misinformation, disinformation

I Introduction

As technology has become the bedrock of society and embedded itself into every facet of existence, it is more vital than ever to understand how technology as an artefact exists in society today. While each new integration of technology has enabled a level of individual success beyond our wildest dreams, there has been a parallel, more insidious realisation that needs immediate attention: a darker construct known as technology inequality. A lack of direct access to technology may also have unintended consequences, identified as online (in)equality. This phenomenon exists when individual end users experience technology differently, leading to differential levels of individual development and the creation of online identities (or IT identities) based on technology access, education and Internet exposure.

In examining technology inequality, Squillace and May¹ operationalise IT Identity Theory developed by Carter and Grover² to conceptualise the notion of IT identity as ‘the extent to which a person views the use of a hardware device, software application or environment as integral to his or her sense of self’.³ The adaptation of IT identity is built on structural symbolic interactionist identity theories and provides that an individual will reluctantly accept the online surroundings they find themselves in while internally adjusting truth in the absence of the physical equipment needed to verify data trustworthiness. This delineation illustrates the highly pervasive nature effects have on individuals without equal access to technology compared to those with it, while often struggling to locate essential physical resources necessary for sustaining life that exist a few ‘clicks away’ for individuals with a technological device connected to the Internet.

Technology inequality, which leads to the deficiency of an individual’s IT identity, is a societal problem that must be addressed. The confluence of factors creating this phenomenon is the net result of a lack of Internet access as a human right for all end users. It is an instrumental component of the destructive nature and negative impact lack of Internet access has on individuals’ quality of life. More importantly, it is critical to identify

¹ May Bantan, Joseph Squillace, ‘Privacy Inequality and IT Identities: The Impact of Different Privacy Laws Adoptions’ (2022) AMCIS 2022 TREOs <https://aisel.aisnet.org/treos_amcis2022/21> accessed 15 October 2024.

² Michelle Carter, Varun Grover, ‘Me, My Self, And I(T): Conceptualizing Information Technology Identity and its Implications’ (2015) 39 (4) MIS Quarterly 931–958, DOI: <https://doi.org/10.25300/MISQ/2015/39.4.9>

³ Michelle Carter and others, ‘IT Identity: A Measure and Empirical Investigation of its Utility to IS Research’ (2020) 21 (5) Journal of the Association for Information Systems 1315, DOI: <https://doi.org/10.17705/1jais.00638>

the severity of technology inequality in the regression of entire communities globally, as restricted Internet access may lead to barriers to education, technology and online awareness based on race and culture.

This article comprehensively examines the complex interaction between Internet access and the United Nations (UN) Sustainable Development Goals (SDGs). By examining key dimensions of digital inequalities and the role of IT identity, this research provides insights into how digital connectivity can promote sustainable development and reduce global inequalities. It also aims to explore the impact of the digital ecosystem on today's societies and its impact on quality of democracy through these concepts and related data.

II Methodology

A key objective of the article is to explore the link between the UN SDGs and Internet access. To do this, it is essential to take as complex a view of the digital ecosystem as possible, eg to look not only at Internet access but also at other quantitative indices that affect the functioning of this digital ecosystem and that can be linked to the individual. These metrics will then be used to demonstrate the qualitative relationship between a qualitative quadrant of quantitative indices and the corresponding social reality, along with the current state of SDG implementation. The purpose of this chapter is to describe the methodological steps used in this research, complemented by a subsequent chapter on the conceptual framework applied within.

The conceptual framework of this article is grounded in the premise that Internet access is a critical enabler of sustainable development. This perspective aligns with the arguments presented by the Internet Society⁴ that emphasise the significance of the digital ecosystem in achieving the SDGs. Due to the dynamic change in the Internet landscape, the UN introduced a strategic initiative to increase online access and user sustainability in the 2000s, including the adoption of the non-binding Millennium Development Goals (MDGs). During this 15-year implementation period, the UN not only identified gaps where more attention was needed, they also acknowledged inefficiencies and inadequacies in the effectiveness of this implementation. The results of this strategy led to the creation of the UN's Sustainable Development Agenda (SDA) and Sustainable Development Goals, which were associated with a General Assembly resolution ultimately adopted by all UN member states (193) in 2015. The accepted general resolution sets out 17 SDGs connected to 169 task-specific objectives (targets) to be achieved through 232 identified and associated task indicators. The SDGs are defined in a holistic way, with the commitments they are attached

⁴ Internet Society, 'The Internet and Sustainable Development an Internet Society contribution to the United Nations discussion on the Sustainable Development Goals and on the 10-year Review of the World Summit on the Information Society' (2015) 4 <<https://www.internetsociety.org/wp-content/uploads/2015/06/ISOC-ICTs-SDGs-201506-Final.pdf>> accessed 15 October 2024.

to intended to be implemented in a comprehensive, non-binding legal and policy-oriented way from the implementation date through the period until 2030.⁵

This article uses a multidimensional approach to explore the role of Internet access in achieving the SDGs, focusing on access inequality, usage inequality, skill inequality and outcome inequality. Access inequality pertains to the physical availability of digital technologies and Internet connectivity, reflecting disparities in infrastructure and affordability.⁶ Usage inequality examines differences in how individuals use digital technologies, influenced by factors such as age, gender, education and socioeconomic status.⁷ Skill inequality addresses the varying levels of digital literacy and competencies among individuals,⁸ while outcome inequality considers the different benefits and opportunities derived from digital technologies.⁹

Data for this article were sourced from multiple reputable organisations, including the UN, the International Telecommunication Union (ITU), the World Bank and the European Commission. These sources provide comprehensive datasets on Internet usage, broadband subscriptions and various socioeconomic indicators. For instance, data on Internet usage rates and broadband subscriptions were obtained from the UN Economic Commissions and the ITU, which regularly publish detailed statistics on global digital access and usage patterns.

Using data sets from indices linked to each SDG and statistical data published by the above-mentioned organisations, the article examines the links between indicators of Internet access, digital literacy and IT identity and the achievement of each SDG. For example, the article analyses the proportion of Internet users in different countries and regions, tracking changes over time, and comparing these trends with progress on relevant SDG indicators such as quality of education (SDG 4), gender equality (SDG 5) and industry, innovation and infrastructure (SDG 9). These analyses will highlight the extent to which the quality of a given society's relationship with the digital ecosystem affects the feasibility of achieving the related SDGs for that state, as well as the impact the identified trends had on social resilience and quality of democracy.

Through the above analyses, the article provides insights into the contextual factors influencing digital inequalities and their impact on IT identity. This includes a review of

⁵ Gábor Kecskés, 'The Legal Meaning of Environmental Sustainability – Do the Ecological SDGs Have Legal Status?' (2023) 107 *Chemical Engineering Transactions* 482, DOI: <http://doi.org/10.3303/CET23107081>

⁶ Laura Robinson and others, 'Digital Inequalities and Why They Matter.' (2015) 18 (5) *Information, Communication & Society* 569–582, DOI: <https://doi.org/10.1080/1369118X.2015.1012532>

⁷ Eszter Hargittai, 'Digital Na(t)ives? Variation in Internet Skills and Uses among Members of the Net Generation' (2010) 80 (1) *Sociological Inquiry* 92–113, DOI: <https://doi.org/10.1111/j.1475-682X.2009.00317.x>

⁸ Alexander van Deursen, Jan van Dijk, 'The Digital Divide Shifts to Differences in Usage' (2014) 16 (3) *New Media & Society* 507–526, DOI: <https://doi.org/10.1177/1461444813487959>

⁹ Paul DiMaggio, Eszter Hargittai, 'From the Digital Divide to Digital Inequality: Studying Internet Use as Penetration Increases' 15/2001 Working Paper of Princeton Center for Arts and Cultural Policy Studies, DOI: <https://doi.org/10.31235/osf.io/rhqmu>

various literature, policy documents and case studies. For example, the research examines how digital inequalities manifest themselves in different socioeconomic contexts and how they affect individuals' ability to use digital technologies for education and economic development.¹⁰ In doing so, it raises much-needed attention to the disproportionate negative impact digital inequalities have on vulnerable groups, including women, children and marginalised communities.

One critical aspect of the qualitative analysis was the concept of IT identity, which refers to how individuals perceive and engage with digital technologies. IT identity is shaped by personal experiences, attitudes and skills related to technology use.¹¹ The article explores how a strong IT identity can enhance digital inclusion and empowerment while a weak IT identity can exacerbate digital inequalities. This analysis was supported by case studies from various regions, highlighting the diverse experiences of individuals in navigating the digital landscape.

III Outline of Concepts Related to the Article

The purpose of this chapter is to provide an outline of the concepts and indices associated with the SDGs, which will be analysed in the remainder of the paper. Digital inequalities refer to the disparities in access to, use of, and benefits from digital technologies among different population groups. These inequalities manifest in various forms, including differences in Internet access, digital literacy and the ability to effectively use information and communication technologies (ICT). The concept of digital inequalities is closely linked to the broader notion of the digital divide, which highlights the gap between those with access to digital technologies and those without it.¹²

Access inequality pertains to the physical availability of digital technologies and Internet connectivity. This includes factors such as the availability of broadband infrastructure, the affordability of Internet services and the geographical location of individuals.¹³ Rural and remote areas often face significant access barriers compared to urban centres, where infrastructure is typically more developed, and services are both more affordable and reliable.¹⁴

¹⁰ Ellen Johanna Helsper, 'A Corresponding Fields Model for the Links Between Social and Digital Exclusion' (2012) 22 (4) *Communication Theory* 403–426, DOI: <https://doi.org/10.1111/j.1468-2885.2012.01416.x>; Martin Hilbert, 'Digital Gender Divide or Technologically Empowered Women in Developing Countries? A Typical Case of Lies, Damned Lies, and Statistics' (2011) 34 (6) *Women's Studies International Forum* 479–489, DOI: <https://doi.org/10.1016/j.wsif.2011.07.001>

¹¹ Royce Kimmons, George Veletsianos, 'The Fragmented Educator 2.0: Social Networking Sites, Acceptable Identity Fragments, and the Identity Constellation' (2014) 72 *Computers & Education* 292–301, DOI: <https://doi.org/10.1016/j.compedu.2013.12.001>

¹² Jan van Dijk, *The Digital Divide* (Polity Press 2020, Cambridge).

¹³ Robinson and others (n 6).

¹⁴ Hilbert (n 10).

Usage inequality extends beyond mere access to include differences in how people use digital technologies. This encompasses the frequency of use, variety of applications and services utilised, and the purposes for which digital technologies are employed.¹⁵ Usage inequality is influenced by factors such as age, gender, education and socioeconomic status. For example, younger and more educated individuals are generally more likely to use a broader range of digital services and applications.¹⁶

Skill inequality refers to disparities in digital literacy and competencies. Digital skills range from basic abilities, such as navigating the Internet and using email, to advanced skills like programming and cybersecurity.¹⁷ Skill inequality can significantly limit individuals' ability to participate fully in the digital economy and society. Furthermore, those individuals lacking digital skills may find it challenging to access online services, secure employment in a digitally driven job market, or engage in digital learning opportunities.¹⁸

Outcome inequality reflects the differing benefits and opportunities that individuals derive from using digital technologies. These outcomes can include improved educational attainment, better job prospects, enhanced social connections and access to healthcare services.¹⁹ Outcome inequality often mirrors and exacerbates existing social and economic inequalities, as those who are already disadvantaged in terms of education, income, or social status are less likely to reap the full benefits of digital technologies.²⁰

IT identity, or digital identity, encompasses how individuals perceive and engage with digital technologies. It reflects the integration of digital tools and platforms into one's personal and social identity. IT identity is shaped by an individual's experiences, attitudes and skills related to digital technologies.²¹ A strong IT identity can enhance a person's confidence in using digital tools, foster a sense of belonging in digital communities, and encourage ongoing learning and adaptation to new technologies. For instance, individuals who regularly engage with digital platforms and perceive themselves as competent users are more likely to integrate these technologies into various aspects of their lives, such as work, education and social interactions. Conversely, those with a weak IT identity may feel intimidated by digital technologies, limiting their use and reducing their ability to benefit from digital advancements.²²

¹⁵ Hargittai (n 7).

¹⁶ Nicole Zillien, Eszter Hargittai, 'Digital Distinction: Status-Specific Types of Internet Usage' (2009) 90 (2) *Social Science Quarterly* 274–291, DOI: <https://doi.org/10.1111/j.1540-6237.2009.00617.x>

¹⁷ van Deursen, van Dijk (n 8).

¹⁸ OECD, 'Skills Matter: Further Results from the Survey of Adult Skills' (2016) DOI: <https://doi.org/10.1787/9789264258051-en>

¹⁹ DiMaggio, Hargittai (n 9).

²⁰ Helsper (n 10).

²¹ Kimmons, Veletsianos (n 11).

²² Ove Edvard Hatlevik and others, 'Students' ICT self-efficacy and computer and information literacy: Determinants and relationships' (2018) 118 *Computer & Education* 107–119, DOI: <https://doi.org/10.1016/j.compedu.2017.11.011>

The relationship between digital inequalities and IT identity is complex and bidirectional. Digital inequalities can negatively impact IT identity by limiting exposure to and confidence in using digital technologies. Conversely, a strong IT identity can help individuals overcome some aspects of digital inequality by motivating them to seek out and utilise available resources and opportunities.²³ Addressing digital inequalities requires a comprehensive approach that considers access, usage, age, skills, outcomes and the development of strong IT identities among all population groups.²⁴ This holistic approach is essential for ensuring that the benefits of digital technologies are broadly and equitably distributed, thereby supporting the achievement of sustainable development goals and fostering global, inclusive digital societies.

IV The United Nations Sustainable Development Goals and Internet Access

In 2015, after the creation and adoption by the UN of the general resolution outlining the Sustainable Development Goals (SDGs), the Internet Society published in parallel a document pointing out that parts of the digital ecosystem (eg ICT products and broadband) are important elements in achieving the SDGs. For example, when discussing the emerging and evolving digital economy, it is important to understand that production, distribution and consumption depend on broadband connectivity while also realising that these economic segments provide the tools necessary for health and education, among other areas. For this very reason, organisations are extremely concerned that no specific SDGs are dedicated to the Internet or the ICT sector.²⁵ Such a narrow sustainability goal would not be expressive enough but creating a complex sustainability goal that covers the whole cyber or digital ecosystem should be considered and supported.²⁶

In addition, each segment of the digital ecosystem is included in several SDGs, targets, or indicators associated with them. For example, in connection with quality education, Goal 4b states that participation in higher education should be increased for developing countries, with emphasis exclusively on African countries, specifically in the field of information technology. Target b of SDG 5 (gender equality) points to the need to increase the use of technologies that improve women's situation, particularly information technologies and to support women's empowerment in these areas. Goal 9 concerning industry, innovation and

²³ Neil Selwyn, 'Reconsidering Political and Popular Understandings of the Digital Divide' (2004) 6 (3) *New Media & Society* 341–362, DOI: <https://doi.org/10.1177/1461444804042519>

²⁴ Jan van Dijk, Kenneth L. Hacker, 'The Digital Divide as a Complex and Dynamic Phenomenon' (2003) 19 (4) *The Information Society* 315–326, DOI: <https://doi.org/10.1080/01972240309487>

²⁵ Internet Society (n 4) 4.

²⁶ Serena Clark and others, 'Including Digital Connection in the United Nations Sustainable Development Goals: A Systems Thinking Approach for Achieving the SDGs' (2022) 14 (3) *Sustainability* 1–13, DOI: <https://doi.org/10.3390/su14031883>

infrastructure – resilient, evolving and sustainable industrialisation – is now unthinkable and impractical without access to the innovative use and development of the digital ecosystem. Lastly, point 9(c) explicitly states that access to information technologies should be increased, with further efforts made to ensure universal, affordable access to the Internet in the least developed countries by 2020. Unfortunately, as we see from the indicators associated with the 17 targets, the latter is far from being achieved. Thus, although several organisations wish to define access to the Internet as a fundamental right (which position the authors of this paper share, especially in the sense that without it, the SDGs are unattainable), the guarantee of this at the global level is currently a dream and simply untenable on a global scale.

However, it can be clearly deduced from the data that state protocols intended to deliberately block access to the Internet violate fundamental human rights.²⁷ Targets 6 and 8 associated with SDG 17 can be interpreted as the culmination of the sustainability target for the digital ecosystem. Target 17.6 promotes collaboration and access to technologies, knowledge sharing and innovation in science, technology and innovation. Target 17.8 states that ‘...by 2017, make the technology bank and the science, technology and innovation capacity-building mechanism fully operational for LDCs and increase the use of basic technology, in particular, information and communication technology’.²⁸ Unfortunately, as can be seen, creating, revitalising and developing a global partnership for sustainability is unthinkable and essentially unfeasible without an improved digital ecosystem. These challenges indicate that a separate SDG for the cyber ecosystem would allow for more effective action in these specific areas, as confirmed and illustrated by the indicators presented below.

Some of the sub-indicators associated with SDG 17 provide a stark indication of how global access to the digital ecosystem has evolved since the adoption of the SDGs. For example, one indicator connected with Goal 17.8 looks at the evolution of the number of Internet users in each country. This indicator shows the proportion of individuals who have used the Internet from any location in the last three months. The data used to showcase this indicator are available from the UN Economic Commissions’ data series. When analysing the European Union Member States according to this indicator, we see that since 2012, there has been a significant improvement. According to target indicator 17.8, the EU average is well above 80, and the Member States with the highest digital literacy rates scored close to 100 percent (eg Luxembourg, Denmark, Finland, etc.), with Italy having the lowest rate among EU Member States, at 71.8.²⁹ Furthermore, regarding Goal 17.8, the world’s leading economic powers achieved the following scores: the United States 91.8, Canada 92.8, Japan

²⁷ ‘Digital rights are vital for sustainable development’ access now, 6 February 2020 <<https://www.accessnow.org/digital-rights-are-vital-for-sustainable-development/>> accessed 15 October 2024.

²⁸ Transforming our world: the 2030 Agenda for Sustainable Development <<https://sdgs.un.org/2030agenda>> accessed 15 October 2024.

²⁹ Internet users per 100 inhabitants <<https://w3.unece.org/SDG/en/Indicator?id=76>> accessed 15 October 2024.

91.1, Australia 85.1 and the United Kingdom 92.6.³⁰ In contrast, the global Internet user index is 67.9, while the index for African countries is 43.2.³¹ Thus, relevant and tangible differences in access to the digital ecosystem can clearly impact the other SDGs (including those dedicated to this area and indicated above). These indicators also immediately channel into SDG 10, which has not been mentioned so far but is concerned with reducing access inequalities between countries.

In this respect, even acknowledging that we are at the start of this journey, it is still necessary to state the reality that there is a need to at least reduce the significant gap that exists between states and countries that refers to the clear and noticeable difference in digital ecosystems, both in terms of fundamental user access to the Internet and how users with access are permitted to use the associated online resources. This change is necessary for not only creating clarity but also resolving other related access objectives.

It may help to refine the significant differences stated above concerning Internet access and use by examining the indicator for target 17.6. This indicator measures the ratio of fixed broadband Internet subscriptions per 100 inhabitants. 'Fixed broadband Internet subscribers per 100 people is obtained by dividing the number of fixed broadband Internet subscribers by the population and then multiplying by 100.'³² This indicator is very important because, in addition to the number of civil subscriptions, it also includes the number of broadband Internet subscriptions of economic operators, thus giving foreign investors an idea of the size of the digital ecosystem in the country. However, it may be misleading as this indicator does not measure the number of citizens with daily access to broadband Internet, but rather measures the number of subscriptions per 100 inhabitants. Even within the EU, the rates established by this indicator are no longer as high as those of the previous indicator. The EU average is between 30 and 40, with the lowest score for Poland, where just 22.7 per 100 inhabitants have broadband Internet access.³³ The figure is 37.4 in the United States, 41.2 in the United Kingdom, 42.1 in Canada, 35.2 in Australia and 35.96 in Japan. The global average of 18.43 has doubled within the past ten years, although the African average is still under 5.³⁴ In his 2020 report on the SDGs, the UN Secretary-General highlighted that fixed broadband Internet is almost non-existent in the least developed EU countries due to the

³⁰ The proportion of individuals using the Internet from the total population of the country <<https://afri-res.unece.org/apps/internet-usage-africa>> accessed 15 October 2024.

³¹ Internet penetration rate in Africa as of June 2022 compared to the global average. <<https://www.statista.com/statistics/1176654/internet-penetration-rate-africa-compared-to-global-average/>> accessed 15 October 2024.

³² Metadata Glossary <<https://databank.worldbank.org/metadataglossary/world-development-indicators/series/IT.NET.BBND.P2>> accessed 15 October 2024.

³³ Fixed Internet broadband subscriptions per 100 inhabitants (any speed), per 100 inhabitants <<https://w3.unece.org/SDG/en/Indicator?id=75>> accessed 15 October 2024.

³⁴ Fixed broadband subscriptions (per 100 people) <<https://data.worldbank.org/indicator/IT.NET.BBND.P2?view=map>> accessed 15 October 2024.

high cost and lack of infrastructure.³⁵ Conversely, the case of China is interesting, where there is hardly any difference between the two measurements, with an Internet access rate of 52.2 and a broadband subscription rate of 41.35, meaning that in China, barely half of society has access to the online digital ecosystem, which obviously creates social fractures and class warfare among its citizens.

The broadband Internet access indicator figure is more telling than the previously identified SDG marker. When correlating broadband Internet access data, it is necessary to understand that a suitable device is required to connect to the Internet, and both are essential for work in the digital economy, education, innovation and research domains. This means that, in the long term, the almost complete absence of such broadband access in some countries will lead to an even greater gap with the countries of the economic centre.³⁶

It can also be seen in the data that, in addition to the access in disparity among states, the lack of Internet access disproportionately affects certain classes of citizens. For example, limited or no broadband access significantly affects people from already vulnerable communities with low economic standing (according to financial income and wealth status), with extreme prejudice affecting women, children, ethnic minorities, users from rural populations and people with disabilities who are traditionally marginalised. In the field of basic education, one in four schools globally lacks essential services (water, electricity, basic sanitation), but the situation is even worse with regard to internet access (which is missing in one in every two schools), depriving the affected children of the opportunity for future social mobility. This realisation suggests the catastrophic deprivation of Internet access for adolescent students, severely reducing their future social mobility, minimising educational growth and limiting both technological and digital literacy.

It is also worth considering that while the average share of people in developed countries who use the Internet is above 80%, many do not have the digital skills required to adequately exploit the benefits of the online digital ecosystem nor respond to its threats. Further attribution occurs partly because even though a large share of people use the Internet, few users actually have adequate and permanent Internet access. This claim is borne out by the fact that only five countries that provide data report a greater than 75% share of citizens who are competent in at least three of the skills of communication/collaboration, problem-solving, security and content creation.³⁷

As can be seen from the above, tackling digital inequalities is a challenge for all countries, even those nations with Internet access above the global average. Therefore,

³⁵ Progress towards the Sustainable Development Goals Report of the Secretary-General 28 April 2020, 19. <<https://documents.un.org/doc/undoc/gen/n20/108/02/pdf/n2010802.pdf>> accessed 15 October 2024.

³⁶ Immanuel Wallerstein, *World-System Analysis – An Introduction* (Duke University Press 2004, Durham and London).

³⁷ United Nations, '2023 The Sustainable Development Goals Report: Special edition. Towards a Rescue Plan for People and Planet' (2023) 20, 21, 47. <<https://unstats.un.org/sdgs/report/2023/The-Sustainable-Development-Goals-Report-2023.pdf>> accessed 15 October 2024.

the next chapter examines the impact the gap in access to the digital ecosystem has on these indicators in each global state society with above-average access. The authors' previous research³⁸ has shown that varied access to the digital ecosystem in the context of a transforming or transitioning economy and state can lead to both situational and long-term livelihood disparities, which ultimately threaten the accomplishment of SDG 16 and its sub-goal of peace and security.³⁹ Digital inequality creates social and security fault lines even within a developed state, highlighting the global need to reduce and ultimately eliminate these inequalities; failure to do so will eliminate all likelihood of success or attainment of the identified SDGs.

V The Impact of Digital Inequalities in the European Union on Society, Specifically IT Identity

If we look at digital inequalities in the context of societies in developed or more developed economic areas, the issue of IT identity becomes very important. In states and regions that are socially backwards (in terms of Internet access and broadband subscriptions), this is an extremely relevant factor, as individuals cannot successfully develop their social or individual IT identities. Meanwhile, within societies in advanced economic areas, digital inequality is clearly identifiable as a dividing factor. Jan van Dijk pointed out in work from 2020 that these 'breakpoints' can also be interpreted as an analytical aspect of the digital divide. They concern who has access to the digital ecosystem, what their characteristics are (income, gender, education, age, characteristics of where they live), how they access it (ie what they use it for and what skills they have in this area), and what types of technologies they have access to.⁴⁰ These criteria can be summarised as fiscal access (a quantitative characteristic) on the one hand and cognitive access (a qualitative characteristic) on the other.⁴¹ The former, financial access, refers to access to technology, while the second, cognitive access, refers to intellectual capacity. Based on the concepts included in the previously referenced paragraphs, financial access identifies the availability of infrastructure (in this case, Internet access, its quality and the existence and quality of a connecting device), while cognitive access recognises the ability to interpret, use and exploit access in an appropriate way for social mobility. Thus, we can infer that a deficit in one of these

³⁸ Roland Kelemen, 'Cyberfare State modelljei: A digitális állam lehetséges irányai' in Ádám Farkas, Roland Kelemen (eds), *A fejlődés fogságában? Tanulmányok a kibertér és a mesterséges intelligencia 21. századi állam- és jogfejlesztési, társadalmi, biztonsági kapcsolódásai* (Gondolat Kiadó 2023, Budapest) 13–42.

³⁹ Ádám Farkas, 'The Status and Role of Law and Regulation in the 21st-Century Hybrid Security Environment' (2022) 11 (2) *Acta Universitatis Sapientiae Legal Studies* 113–124, DOI: <https://doi.org/10.47745/AUSLEG.2022.11.2.07>

⁴⁰ van Dijk (n 12) 1–3.

⁴¹ Tibor Szarvák, 'A digitális szakadék mint új periféria-képző jelenség' (2004) 18 (3) *Tér és Társadalom* 59, DOI: <https://doi.org/10.17649/TET.18.3.958>

(ie, technological inequality) profoundly impacts the other (ie, IT identity). Moreover, this impact can be seen on social mobility and, from a societal perspective, on resilience and, not insignificantly, on the overall quality of democracy.

The relationship between these two indicators was exemplified by the Covid-19 pandemic, which accelerated the digital switchover in numerous areas, including the closure of educational institutions, the implementation of digital education and the introduction of the home office. Additionally, research has shown the existence of a tangible link between digital inequality in the EU and the resultant low level of IT identity in other countries or regions during the spread of the epidemic. For instance, in areas where Internet use was lower (conscious usage by end users), or unequal between social groups (male and female, age distribution, educational attainment), the virus was able to physically spread more rapidly and with greater severity than in states or regions where these inequalities were less relevant.⁴² A report by Friedrich Ebert Stiftung that focused on inequalities in Hungary during the Covid-19 pandemic explicitly addressed the evolution of digital inequalities. The research found that 91% of individual users who were surveyed had household Internet access. It is worth noting that while the specific question that was asked did not focus on what type of Internet access this meant, other data related to the research was extensively collected for analysis. Of users with the highest Internet use who were surveyed, 60% were from lower-income households. Moreover, 83% of households reported having a computer, and 91% of users had a smartphone, with only 5.5% indicating they had no devices. This disproportion becomes greater in small villages located in the eastern or southern parts of the country. Significantly, only 16% of individuals living in difficult economic or poor financial circumstances had insufficient digital devices to facilitate the learning of children and the work of adults.⁴³

It is also worth comparing how EU and national averages have evolved in this respect during the same period. In the EU, 90% of households reported having broadband Internet (fixed or mobile), encompassing 90% of respondents residing in large cities and 86% living in smaller rural areas. However, the variation is much higher for fixed Internet compared to mobile Internet. On average, in the EU, 76% of households have a subscription to either fixed or mobile Internet, while in the Netherlands, the rate is almost 100% Internet access for combined rural and urban users. In comparison, Bulgaria, Romania, Latvia, Lithuania and Italy each have a rate below 60%. It should also be noted that Finland has a very low rate, but this is compensated for by the high quality and coverage of mobile Internet, which does not significantly improve the average in other countries. The picture is further complicated by the fact that the proportion of people who connect to the Internet daily is smaller than

⁴² Marta Borda, Natalia Grishchenko, Patrycja Kowalczyk-Rólczyńska, 'Impact of Digital Inequality on the COVID-19 Pandemic: Evidence from European Union Countries' (2022) 14 (5) Sustainability 1–13, DOI: <https://doi.org/10.3390/su14052850>

⁴³ Éva Fodor and others, *Az egyenlőtlenségek alakulása a koronajárvány idején Magyarországon* (Friedrich Ebert Stiftung 2020, Budapest) 17–18.

this, at 80% on average in the EU, with some countries and smaller municipalities closer to 60%. These countries are roughly the same as those with low network coverage, most notably Romania and Bulgaria, where daily Internet access is below 80%, even in large cities. It should further be pointed out that, on average, for the EU as a whole, there is more than a 10% disparity between the daily Internet access of people living in rural areas (73%) compared to those living in urban areas (84%). Researching the figures in regard to technological inequality, the number of people with a laptop (desktop computers are not specifically mentioned in EU statistics) in the EU is nearly 60% in large cities, compared to 47% in rural areas. While true, in the previous noted countries where we have seen high rates, this is also the case for this category, with rates close to 80% in Denmark and the Netherlands (large cities) and above 70% in rural areas. In contrast, Romania (18% and 40%), Bulgaria (18% and 40%) and Italy (24% and 33%) are associated with the lowest figures.⁴⁴

As we move from technology inequality indicators to IT identity (or cognitive) statistics, the EU has examined the proportion of citizens with skills above the basic level in information and data literacy, communication and digital content creation in three categories for each Member State. The aggregate data shows the EU average is 26% (one in four EU citizens have greater than basic skills in all three areas). In terms of metropolitan areas, Germany, Ireland, Spain, Croatia, Luxembourg, Austria, Sweden, Denmark, the Netherlands and Finland have rates above 40%. Bulgaria and Romania are far below the EU average in this category, where even in large cities, the proportion is below 15%. However, there is a relevant difference between rural and metropolitan areas in this category for all Member States. Looking at the individual categories, we obtain much higher rates, but Romania and Bulgaria are the two countries most behind in each category.⁴⁵

It can also be observed that digital inequality and weak IT identity go hand in hand. EU statistics on digital inequalities confirm this, with the EU average of 58% of individuals banking online and the largest share in countries with the least digital inequality and the highest levels of IT identity. Meanwhile, the use of online banking services by Romanian and Bulgarian citizens is well below the average for the Member States. However, there is also very wide variation between urban and rural populations in this category as well, except for Finland, Denmark and the Netherlands, where the rates are almost identical. The largest difference in this category is Hungary, where 70% of the population in large cities use these services, compared to just over 42% in rural areas. Hungary has a similar relevant difference in IT identity (14% and 28%) between municipalities and the cities, so although the proportion of skills in the cities is above the EU average (but below the EU average in the metropolitan category), there is a marked overall gap in IT identity compared to the EU average. This categorical anomaly in Hungary is interesting because, on the technological

⁴⁴ EuroStat, 'Urban-rural Europe – digital society' (2022) <https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Urban-rural_Europe_-digital_society#Individuals_.E2.80.93frequency_of_internet_use> accessed 15 October 2024.

⁴⁵ EuroStat (n 44).

inequality side, there does not seem to be a huge difference compared to the EU average. Still, here we should refer back to the Friedrich Ebert Stiftung report, which points out that the eastern and southern regions of the country are lagging behind the central and western parts of the country, as confirmed by other research.⁴⁶

In response to the negative impact and harm caused by digital inequality, the European Parliament adopted a resolution on 13 December 2022 aiming to reduce digital inequalities. The resolution states that ‘whereas digitalisation can adversely affect people who lack sufficient digital skills or do not have access to an internet connection or to digital devices; whereas it may accentuate social differences by reducing some workers’ opportunities to obtain quality employment.’ However, this document points out that the EU has a relatively low digital competence rate; there is a digital divide in education in some Member States to the detriment of some students and teachers; 5.3% of school-age children are digitally deprived, and there are significant differences between the Member States. The action plans set out in the resolution essentially identify the need to achieve the sustainable development goals identified above: education, the inclusion of vulnerable social groups and the reduction of infrastructure gaps.⁴⁷

VI Conclusion

It is essential that the goals for the digital ecosystem are formulated as a stand-alone sustainable development goal associated with a comprehensive policy framework. EU statistics point out that even in economically more developed regions, digital inequality and the resulting differences in levels of IT identity can generate significant social divides. The poorer regions (particularly Africa) are at a strategic disadvantage in this regard, making social mobility impossible for the rising generation. Providing users with increased global Internet access, ensuring online Internet access is a basic human right, and allowing all individuals to use the Internet, regardless of socioeconomic standing or status, is the first step to protecting end users. Pursuing this goal will aid in providing the requisite education necessary to prepare citizens to identify online threats, reduce their personal exposure online, and mitigate the spread and engagement of (mis)information and (dis)information at high levels.⁴⁸ This is necessary to save not only our fellow man but may be the only way to save democracy itself from the modern-day digital Fall of Rome.

⁴⁶ Anikó Fehérvári, ‘Digitális egyenlőtlenségek Magyarországon’ (2017) 26 (2) *Educatio* 157–168, DOI: <https://doi.org/10.1556/2063.26.2017.2.1>

⁴⁷ European Parliament resolution of 13 December 2022 on the digital divide: the social differences created by digitalisation (2022/2810(RSP)), [2023] OJ C177/57.

⁴⁸ János Tamás Papp, ‘Recontextualizing the Role of Social Media in the Formation of Filter Bubbles’ (2023) 11 (1) *Hungarian Yearbook of International Law and European Law* 136–150, DOI: <https://doi.org/10.5553/HYIEL/266627012023011001012>