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Implementation of Digital Solutions in the Social Sphere: Modern Methods of Program Organization and Development

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Abstract

The integration of digital technologies and innovative approaches into the field of social programs has become an important tool for modernizing public administration in the face of global challenges, including military crises, pandemics, and natural disasters. This topic is of particular relevance for Ukraine, which, in the context of a full-scale war, is demonstrating an unprecedented digital transformation, in particular in the field of social programs, as well as cybersecurity and defense capabilities of the state. The purpose of the article is to study digital platforms as innovative means of implementing social programs, and the object is the process of digitalization of social services in Ukraine and Estonia, and the author outlines these processes on a global scale. The main European approaches to digitalization through the prism of the Digital Decade – Policy program were also described. Special attention was paid to the digitalization of social policy in the activities of The World Bank. The experience of Estonia, as one of the world

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leaders in the digitalization of various spheres of life, as well as an influential partner in this area for both international organizations and individual nation states, was studied in more detail. The article traces the country's digitalization ecology with a focus on the social component. The functional characteristics of the platforms in Ukraine "Diia" and "Kyiv Digital" were also analyzed in the context of social services provision. The key areas of digitalization, such as registration of the status of internally displaced persons, access to financial assistance, medical services, use of electronic documents, etc. were highlighted. The advantages of digital tools include mobility, accessibility, efficiency of service, reduction of administrative burden and reduction of corruption risks. At the same time, a number of problems are once again emphasized, including digital inequality, energy dependence, cyber risks, and insufficient digital competence among certain segments of the population. The practical significance of the study lies in the generalization of the Ukrainian experience of digitalization of social services. This can become the basis for developing policies in the field of social protection, digital inclusion and intercultural communication in the context of crisis transformation.

Keywords: e-governance; electronic public services; cybersecurity; mobile applications of public services; social support; digital inclusion; digital transformation; digital technologies in governance; digitalization of social services.

Introduction

In the 21st century, digital technologies are having a dramatic impact not only on business and education, but also on social policy, opening up new perspectives for implementing social support programs. Given global challenges, such as the COVID-19 pandemic, military conflicts, and mass migration, digitalization in the social security sector is gaining particular importance. This has been discussed for decades, and in practice authors see the rapid changes that our lives are undergoing under the influence of digital technologies. Only on August 6, 1991, Tim Berners-Lee launched the first website; on August 11, 1994. Net-Market made the first secure online payment; in 1995, Amazon and eBay started online trading (Pizhuk & Muravyov, 2022), and today people are even afraid to imagine our lives without scrolling through news feeds or buying goods or ordering services online.

Digitalization allows the state to respond more quickly to crisis situations, ensure transparency of management processes, and strengthen the principles of social justice (Digital Decade – Policy program, n.d.). At the same time, digital transformation is not only a technological phenomenon, but also an important cultural and social change that rethinks the very format of interaction between the citizen and the state, focusing on issues of accessibility, trust and inclusion (Nosratabadi et al., 2023).

The purpose of the article is to review the processes of digitalization of the social sphere of public administration in global and local formats, with a focus on specific social programs implemented through digital technologies. In particular, attention is focused on the European experience and the social activities of The World Bank. The cases of Estonia and Ukraine are considered separately – as countries with incredible digital potential and demonstrating impressive progress in the digitalization of the social sphere, despite unfavorable circumstances. This is especially true for Ukraine, which has demonstrated incredible results in digitalization in a short amount of time, in the face of a grueling war (Golovach & Chervona, 2025).

Literature Review

In the modern world, the digitalization of social processes is seen as a strategic tool for optimizing public administration and ensuring social justice**.** Digital technologies open up access to online education and new employment opportunities for people from different social groups, including those living in remote regions and those with limited financial resources. This helps to develop skills and improve life prospects (Golovach & Chervona, 2025; Khaustova *et al*., 2024; Martindale & Lehdonvirta, 2023).

The integration of digital technologies into social policy not only simplifies and automates administrative procedures, but also significantly increases the accessibility and transparency of services, especially for the most vulnerable segments of the population. Priority areas of research in this area include digital services in public administration, e-democracy, the use of big data to solve social problems, ensuring digital inclusion and developing digital competence of the population (Khadzhynov *et al*., 2022; Kondratenko *et al*., 2022; Lawson, 2017; Kwilinski *et al*., 2020).

A number of scientific studies have also focused on the challenges and risks arising from the digitalization of society. The digital divide, the insufficient level of digital competence among users of social services and professionals in this area, has been repeatedly emphasized. This is especially true for countries with developing economies. Legal and ethical issues also remain on the agenda. As well as cyber defense and cybersecurity (Lythreatis *et al*., 2022; Možnik *et al*., 2023; Ronges, 2021; Zhuk *et al*., 2023).

Despite significant progress in the study of digitalization and the multifaceted aspects of its impact, risks, achievements, and prospects, there is still a need for a thorough analysis of its relationship with institutional modernization and the social impact of digital transformation programs. This issue becomes especially relevant in times of crisis, such as pandemics, military conflicts, or energy threats.

In particular, this is why authors have focused on the cases of Estonia and Ukraine in our article, as countries that were once forcibly part of the USSR and now find themselves in different historical and cultural circumstances. However, they also have a number of common features. In particular, it is the threat from Russia. In Ukraine, a protracted Russian-Ukrainian war, the War for Ukrainian Independence, is ongoing. While Estonia, with the aggressive country of Russia close to its borders, is also at risk. At the same time, both Ukraine and Estonia demonstrate incredibly high rates and pace of digitalization in various spheres of life, being leaders in this area by many indicators (Leveraging safety nets to prevent gender-based violence, 2023).

Methodology

The article uses a comprehensive approach that combines theoretical and analytical methods to systematically examine the processes of digitalization of social services in Ukraine and abroad. The theoretical basis was the concepts of digital transformation, e-governance, and social inclusion outlined in scientific research (Azizi-Meshkin, 2024) and especially the factual and analytical material found on the websites of the European Commission, the European Union, The World Bank, Ukrainian media, and government agencies. To collect empirical data, authors conducted a systematic analysis of official documents, Estonian media materials, reports of the Ministry of Digital Transformation of Ukraine, Kyiv City Administration, as well as public databases and digital platforms (Diia, Kyiv Digital). A qualitative content analysis of media and academic publications made it possible to outline the current state of digital transformation, its benefits and challenges. The analytical approach made it possible to identify development trends, assess the impact of digital innovations on the effectiveness of social governance, and identify gaps in digital inclusion and cybersecurity. Due to the complexity of the research methods, it was possible to form a holistic vision of the development of digital social programs that combines theoretical developments and practical cases. This approach contributes to the development of sound proposals for further improvement of digital policy in the social sphere.

Results

A social program is a set of defined projects aimed at solving a specific social problem and achieving the strategic goals of society. If delve a little deeper into the history of social programs, it can recall such important steps in this direction as the creation of organized social welfare programs through the adoption of the Poor Law by the English Parliament during the Elizabethan era in 1601. It allowed

the government to provide for the poor living in local parishes. It also introduced a system of mandatory funding outside the church. The principles and policies of the English Poor Laws were followed by the settlers of the American colonies in the early years; however, the impact of the War of Independence, as well as large-scale immigration, rapid industrialization, and urbanization, significantly increased poverty and, consequently, the tax expenditures needed to help the poor. To reduce these costs, new laws were passed, according to which no able-bodied person between the ages of 18 and 50 received public assistance; and young people, the elderly, and people with disabilities who could not take care of themselves were placed in state or religious institutions (Hansan, 2017).

In addition, the history of social programs dates back to the late 19th century in Germany, when they were focused on such key areas as poverty relief, charity, and the women's movement. In 1880, the German Charity Congress initiated the creation of the German Charitable Union for the Care of the Poor. Later, in 1919, the organization was renamed the German Union of Public and Private Welfare. This structure became the main union that brought together public, private and civic institutions, as well as individuals involved in the implementation of social work. Initially, the activities covered Germany, and after the reunification of Germany, they spread to the whole country (Palahniuk & Pismychenko, 2018).

Today, social programs are widespread in almost all countries of the world. However, they differ in various ways. In particular, they differ in terms of financing methods; management systems; the degree of population coverage; and the level and scope of available services and benefits. Social programs are usually divided into several conventional groups. Authors are talking about social welfare and security programs. They focus on supporting the population's income. Authors can also distinguish socio-demographic and healthcare programs. There are many countries with national or international anti-poverty programs that combine elements of all of the above social areas of work. Today, social protection is not just financial or in-kind direct assistance. First and foremost, it is a long-term program aimed at helping individuals, communities, and employees overcome a crisis, gain opportunities for self-realization, development, and employment. Modern social programs are based on three components: social assistance, social insurance, and a labor market program. This helps to create a path to self-sufficiency and independence for those who need such support. For example, over the past 20 years, The World Bank Group's social protection and labor programs have helped more than 222 million people in 72 countries.As of April 2025, The World Bank is providing $29.5 billion in financing for various social initiatives in the face of global crises. Unfortunately, the demand for such initiatives is growing worldwide. Despite significant progress in solving social problems at the global level, still 2 billion people on the planet remain unreached or insufficiently covered by social support and protection. Three out of four people in low-income countries do not have even a basic form of social protection (Loewe, 2008). And 50% of the population in lower-middle-income countries do not have adequate protection.

Women in these countries are particularly affected. Demographic impacts on the labor market are also already evident. Over the next decades, about 1.2 billion young people will reach working age in emerging markets alone. At the same time, according to current forecasts, job creation will be limited to only 420 million. To effectively address this potential crisis, social protection programs will play a crucial role. To ensure their expansion and contribute to the creation of more jobs, it is necessary to increase the volume and improve the efficiency of spending. External support is particularly important for low-income countries, particularly in Africa and South Asia, where social protection gaps are most pronounced. Efficiency can be improved by optimizing the redistribution of resources, eliminating regressive subsidies, and introducing diversified sources of funding. This will be facilitated, among other things, by innovative management mechanisms using digital service delivery platforms. In this context, it is important to pay increased attention to knowledge development, evidence collection, learning promotion, and strengthening of partnerships that facilitate the coordination of collective action for the overall social protection agenda (Social Protection and Labor. Overview, 2025). For an example, see Table 1.

Table 1. Social digitalized projects of The World Bank

Project	Objective and implementation
ASPIRE: Atlas of Social Protection Indicators for Resilience and Equity	The World Bank's main tool for assessing the scale and effectiveness of social protection programs. The platform was created by the Global Social Protection and Labor Practice. It contains data for 140 countries on social assistance, social insurance systems, and labor market-related programs. The information is based on administrative data on individual programs and the results of national household surveys. The monitoring results are used to analyze the issue of strengthening social protection and labor systems in low- and middle-income countries. Approaches to gradually closing gaps in coverage and ensuring an adequate level of services for the world's most vulnerable populations are considered
Safety Nets to Prevent Gender-based Violence	As of the beginning of 2023, more than 20 social protection programs funded by The World Bank include elements of preventing and responding to gender-based violence, with more projects underway. Key interventions include: adapting awareness-raising campaigns; working with communities to transform gender stereotypes and attitudes toward gender-based violence; complementing initiatives such as life skills training, interactive behavior change sessions, and group savings programs with violence prevention efforts; establishing complaint mechanisms that are sensitive to the specifics of such violence to accurately record and respond to cases in a survivor-centered manner; and strengthening systems for Opportunities for gender-based violence prevention and risk reduction are integrated into all stages of the social protection process. To make the approach to violence prevention more systematic and effective, specific resources for practitioners have been developed and are available through The World Bank Group's

Rapid Social Response Program (RSR).	A key tool for implementing The World Bank's Social Protection and Employment Compass 2023-2028, the RSR Program aims to ensure universal social protection, strengthen equity, resilience, and create opportunities for all vulnerable households. The program works with clients in IDA member countries to help build adaptive social protection systems that are responsive to urgent needs. Since its inception, the RSR and RSR-ADSP have disbursed $141 million to finance 384 interventions in 109 countries spanning all six World Bank regions
Solutions for Youth Employment (S4YE)	A global consortium that brings together donors, government agencies, charities, private sector organizations, and non-governmental organizations. The network is dedicated to promoting innovative strategies and programs aimed at empowering young people to access decent and productive employment opportunities. S4YE is part of the Global Labor and Skills Solutions Group, part of The World Bank's Global Social Protection Practice. Its activities are funded through the Jobs Umbrella Multi-Donor Fund. Current donors of the fund include: Austria (Federal Ministry of Finance), Germany (Federal Ministry for Economic Cooperation and Development, BMZ), Italy (Ministry of Economy and Finance), Sweden (International Development Cooperation Agency, Sida), and the United Kingdom (Foreign and Commonwealth Office, Department for International Development). Additional contributions are provided by the Austrian Development Society and the German Society for International Cooperation (GIZ)

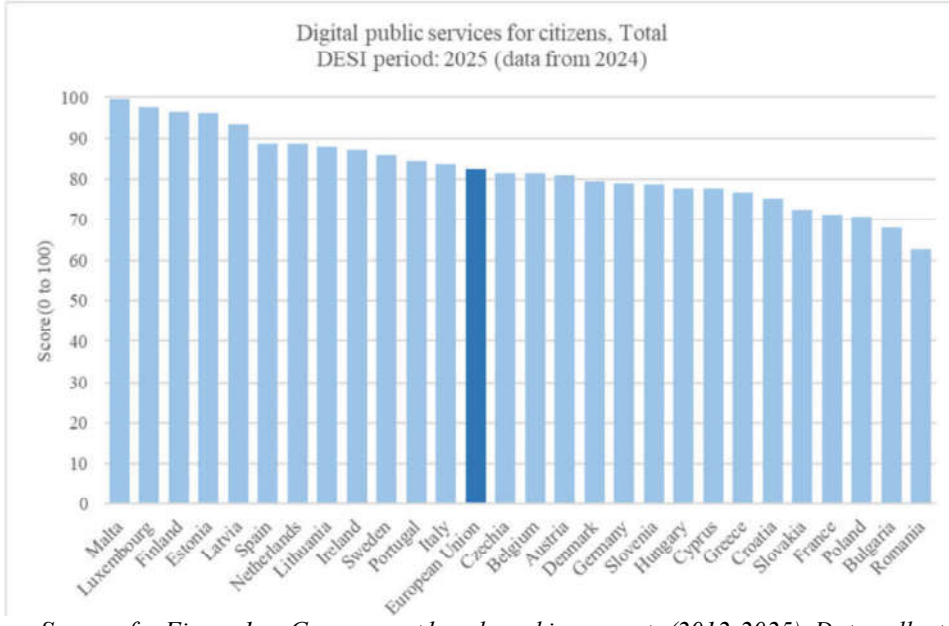
Source: (ASPIRE: The Atlas of Social Protection Indicators of Resilience and Equity, n.d.; Leveraging safety nets to prevent gender-based violence, 2023; Rapid Social Response Program (RSR), n. d.; Turning crisis into opportunity, n.d.)

Since 2014, the European Commission has been tracking the digital progress of EU member states. The analysis is based on the reports of the Digital Economy and Society Indices (DESI). It covers areas such as connectivity, human capital, internet use, digital integration, and digital public services (The Digital Economy and Society Index (DESI)).

According to the results of 2024, digital public services for citizens of EU member states accounted for an average of 82.32% of all social services provided (blue column in Figure 1). The three leaders in the digitalization of public social services are: Malta (99.7%), Luxembourg (97.66%), and Finland (96.32%). The lowest indicators as of 2024 are Poland (70.69%), Bulgaria (67.98%), and Romania (62.75%) (Figure 1).

In general, as shown in Figure 1, the level of digitalization of public social services in EU member states is quite high and shows an upward trend. This is in line with the objectives of Europe's Digital Decade. It is based on 4 main points: digital competence of citizens and highly skilled digital professionals; sustainable and secure digital infrastructures; and digital business transformation.

Digital transformation, as conceived by its developers, should be in line with the EU's Aims and values (n.d.) and should benefit all EU citizens without exception. To achieve this, it is necessary to build a secure and reliable digital world through which public services will be provided online; to ensure that everyone can access and use digital opportunities; and to ensure cybersecurity at all levels.



Source: for Figure 1: e-Government benchmarking reports (2012-2025). Data collected by Capgemini and verified by the relevant ministries in each EU member state (European Commission. Shaping Europe's digital future, n.d.; Publications Office of the European Union, 2025)

Figure 1. Digital public services for citizens

It is also important that small businesses and industry have access to data on the implementation of digital technologies, information analytics and AI, which will help them compete in the digital world on equal terms. The program also provides for the promotion of innovation infrastructures by supporting relevant research, development of sustainable, energy and resource efficient innovations. The Digital Decade 2030 policy program establishes a framework for tracking progress towards the 2030 goals and targets at both national and EU level. Within this framework, the Commission and the Member States work together to assess progress and make adjustments to ensure that the EU remains on track to achieve its goals. Throughout the Digital Decade, i.e. until 2030, the EEU aims to achieve its goals

in practice, focusing first and foremost on the interests of its citizens, enhancing business opportunities and the sustainable development of the digital society. Such ambitious plans are linked to the vision of a digital society in which digital technologies enable new forms of learning, working, entertainment, research, and the realization of ambitions. In addition, they bring new rights and freedoms, enabling EU citizens to move beyond their physical communities, geographical locations, and social niches. However, important and serious challenges remain on the agenda. First of all, in the digital world, life should be based on European values, where every human person is important and valuable, no one should be left on the margins of life and should be able to enjoy freedom, protection and social justice. Therefore, during the Digital Decade, it is imperative that everyone who shares this vision take advantage of the opportunities offered by the latest technologies and acquire the appropriate digital skills. It has become as essential as the ability to read and write. Internet connectivity is increasingly reaching people, despite natural barriers and the remoteness of their residence from urban centers. Key public services and administrative procedures are provided online for the convenience of citizens and businesses (Digital Decade – Policy program, n.d.).

In 2021 alone, the EU allocated significant financial resources to support digital transformation. A total of €127 billion was earmarked for reforms and investments in digital technologies. This creates unique conditions for accelerating digitalization and reducing external dependence by implementing reforms and directing funding to the relevant areas. On average, EU member states have allocated approximately 26% of their budgets from the Recovery and Resilience Facility (RRF) to measures that promote digital transformation, exceeding the 20% minimum. EU countries such as Austria, Germany, Luxembourg, Ireland, and Lithuania have allocated more than 30% of their RRF allocations to digital development (The Digital Economy and Society Index (DESI), 2024). These are simply unprecedented figures aimed at such a large-scale transformation of the governance system.

Social programs have undergone a significant evolution, from the first laws on assistance to the needy to modern comprehensive measures covering a wide range of social challenges in different parts of the world. Today, they have acquired the status of a global phenomenon, actively developing thanks to digital technologies and the use of innovative solutions implemented by international organizations such as The World Bank and the European Union. At the same time, despite the remarkable progress, billions of people still lack basic social protection, which necessitates further expansion and improvement of these programs, particularly in low-income countries.

Now, we would like to describe specific examples of two countries that demonstrate different strategies of their digital development and its implementation in the social sphere, Estonia and Ukraine.

Estonia

In 1991, after 50 years of Soviet occupation, the Baltic country of Estonia returned to the political map of Europe. At that time, it had limited and outdated technological systems and seemingly insignificant resources (Raun, 2009). However, the opportunity to start from scratch was used to the maximum extent possible in terms of digital development and the introduction of modern management methods in various spheres of society. There was an ambitious goal to build a state-of-the-art technological infrastructure to meet the European integration aspirations of the small Baltic country. A few years later, in 1994, the Estonian parliament developed and ratified the first draft of the Estonian Information Policy Principles. It was a strategic plan for IT development. Even then, 1% of GDP was allocated for public funding of IT. The nationwide IT infrastructure development program "Tiger Leap" was launched in 1996. The main goal was to upgrade the existing IT infrastructure in accordance with European standards and to prioritize the development of computer skills in school education. As a result, 99% of the Estonian population regularly uses the Internet. Estonia has since been at the top of the Digital Development Index. This was a truly impressive result, given all the historical and political contexts and circumstances under which such a rapid digital transformation took place.

At the same time, in 1996, the first electronic banking services were launched. Private banking organizations developed the relevant proposals. The main objective was to make banking services accessible to customers in rural communities. As a result, high-quality e-banking services were developed that encouraged people to use the Internet, e-governance, and, later, to switch to electronic identification (ID). At the beginning of the twenty-first century, Estonia started holding electronic meetings of the Cabinet of Ministers. A database and scheduler were developed to optimize government decision-making processes. This helped reduce bureaucratic procedures by incorporating electronic decisions into the management system. Importantly, the average duration of a meeting of the Cabinet of Ministers of Estonia was reduced from 5 hours to 30 minutes. In 2000, the electronic tax council was launched. Since then, Estonians have been able to declare taxes online. This tool has maximized tax revenues to support the growing needs of society. Currently, it takes about 3 minutes to declare taxes online; 99% of taxpayers declare their income electronically. Since then, m-Parking has been in operation, allowing drivers to pay for parking in the city using their mobile phones. This has greatly simplified the management of growing traffic in densely populated urban areas and created a modern and inexpensive parking infrastructure. As a result, 95% of parking fees are paid by using mobile phones. This parking system has been implemented in various countries around the world. The following year, in 2001, Estonia created the national integration platform X-Road to reduce data exchange costs and stop data flows from insecure platforms. It became the basis of e-Estonia, allowing the country's public and private sector information systems

to be connected and interoperate seamlessly. Since then, 100% of public services have been available online around the clock. The next step was the introduction of electronic identification and digital signatures in 2002. Digital identification is based on a mandatory identity card. This approach allows people to be reliably identified through public and private electronic services. Today, 99% of Estonians have an ID card, and digital signatures save 2% of GDP annually. To ensure accessibility to local and national elections, i-voting has been used since 2005. This voting system has also allowed citizens to vote freely from other countries. One third of the votes cast during elections are online, including from more than 110 countries where Estonian citizens live (eEstonia, n.d.; Horowitz & Tamkivi, 2014).

This level of digitalization has exacerbated the problem of cybersecurity. For example, in April 2007, Estonia suffered a powerful organized external cyberattack. International cooperation was needed to contain this threat and eliminate its consequences. In particular, the NATO Cooperative Cyber Defense Center of Excellence and the EU Information Technology Agency are located in Tallinn. Estonia is one of the leading countries in the field of cybersecurity (Dilek *et al*., 2023).

In 2008, Estonian cryptographers developed the scalable KSI blockchain technology. The goal of this project was to mitigate the threat of insider data manipulation in Estonian registries after the 2007 cyberattacks. Several state registries are also supported by the KSI blockchain. In the same year, a nationwide system integrating data from Estonian healthcare providers, eHealth, was launched. It has improved the quality and efficiency of healthcare provided through public insurance. Electronic medical records provide a detailed profile of each patient, reducing the amount of paperwork and ensuring quick access to important information in case of emergency. Since 2010, the electronic prescription system has been in operation, providing centralized issuance and processing of medical prescriptions. 100% of medical prescriptions are processed online, and regular repeat prescriptions can be obtained without an appointment if necessary.

In 2013, the government introduced a mapping of problems and solutions for the development of public e-services, the so-called Green Book on Public Services. This approach helps to address the current shortcomings of the e-state to ensure its sustainability and further development. This approach provides a better understanding of the public's needs and a clear definition of the goals and principles of e-services development (European Commission, 2016).

Another important task is to use digital technologies for business development and international investment. To this end, in 2014, Estonia introduced e-residency, a digital society without borders that any citizen of the world can join. E-residency in Estonia became the first digital country for global citizens. The number of e-residents and their businesses is constantly growing. In the same year, the Road Administration's electronic portal, a single online service for drivers and vehicle

owners, was launched. The Road Administration's system provides services six times faster and 20% cheaper, which significantly increases the transparency of the procedure and saves time.

The first data embassy outside the country's borders was established in 2017. The main objective of the project is to ensure the digital continuity of Estonian statehood in the worst-case scenarios, such as critical system failures or external threats (the 2007 cyberattack and the neighborhood with Russia are in the memory). In Luxembourg, the data center stores Estonia's databases and services. Estonia has thus become the world's first country in the cloud (Espinosa & Pino, 2024).

The Nordic Institute for Interoperability Solutions (futher – NIIS) provides development and strategic management of the X-Road consortium and other e-government solutions , ensuring the interoperability of e-government solutions and platforms both nationally and internationally. The NIIS was founded by Estonia and Finland in 2017 for cross-border e-governance solutions, aiming to provide better content and services to the public.

Since 2018, the Roadmap for Uninterrupted Services has been launched, primarily to minimize bureaucracy, especially in the context of rapid response to critical events. thus, freeing up human resources to perform routine administrative public services.

The government's AI strategy, which outlines the current and future use of AI in public and private services, has been approved since 2019. Its task was to create a legal and strategic framework to accelerate the development of AI. A detailed and well-thought-out strategic plan facilitated the implementation of AI solutions in the public and private sectors.

In 2020, the service of activating proactive childcare was introduced. After the birth of a child, the corresponding record activates all subsequent services, so the family automatically receives all the benefits and support due in this case. Parents of a newborn child no longer need to spend time and effort on various applications for child benefits. Also, starting in 2022, there will be a possibility of e-marriage by submitting an online application for marriage to the electronic population register. The introduction of online marriage required amendments to the legislation. In addition, starting in 2024, it will be possible to file for divorce online. Also, since 2020, it has been possible to remotely check the work of notaries using the Veriff online identity verification platform. In addition, it allows to buy or sell real estate without physically being in the same space, during or after the pandemic.

The world's first autonomous hydrogen vehicle, Liisu, developed by Auve Tech and researchers at the University of Tartu, has been operating since 2021. The development combines autonomous driving and remote control with hydrogen fuel and is an environmentally friendly alternative to private cars.

Since 2024, Estonian citizens have been able to access public services through the Eesti.ee app. The creation of this state subsidy required the integration of

several state systems into a seamless user interface, while ensuring the highest level of security. As of today, all public services are 100% digitized (eEstonia, n.d.).

Estonia's digital transformation and technological coverage of various spheres of society and the state have become a vivid example of the effective use of limited resources to create and implement an innovative state management model, including in the implementation of various social programs. An integrated approach to digitalization policy, coherence between sectors, and openness to innovative ideas have helped the country not only achieve full digitalization of public services but also establish itself as a global leader in e-governance and cybersecurity.

Ukraine

Ukraine's IT sector is characterized by professionalism, modern infrastructure, and an active startup ecosystem that continues to grow even in the extremely difficult conditions of the Russian-Ukrainian war. Thanks to technological progress and global competitiveness, Ukraine has gained a reputation as a "Digital Tiger".

"And Ukraine has a lot to be proud of in this area. The whole world is watching with admiration and adopting our experience in digitalization and e-democracy development. The war has shown that e-governance and digital services have remained not only relevant but also an effective tool of public administration. Digitalization today is the best example of the resilience and capacity of the Ukrainian state" (Levchuk, 2024).

Hundreds of public services have been digitized in Ukraine. In particular, in 2023, 64% of Ukrainians used state e-services. The Diia app is used by 20 million Ukrainians. In 2025, there will be 22.7 million such citizens (Digital State UA, 2025). The Diia portal offers more than 100 government services, while the mobile app offers 14 documents and more than 30 services.

The pilot version of the Diia application was developed by a team of volunteers from the IT company EPAM. It involved 35 specialists who met for the first time in person during the presentation of Diia's launch. In the fall of 2019, the Ministry of Digital Transformation was formed in Ukraine. One of the Ministry's project ideas was to digitize public services. The first step was to create a corresponding web portal. The discussion was led by Mykhailo Fedorov, who is currently the First Vice Prime Minister of Ukraine. He proposed to develop the architecture of the portal and the application itself, which could be supplemented with new features in the future. The first function of Diia was the ability to authorize through PrivatBank and monobank, connect with the registers of the Ministry of Internal Affairs and display information. By the end of 2019, the service was improved. In January 2020, the first large-scale testing took place, involving 20 thousand Ukrainian citizens. On February 6, 2020, Google Play and the App Store published the Action for download. From the very beginning, special attention was paid to data protection. For further development, the app was transferred to the state-owned Diia Company. Today, Diia is considered one of the best mobile

applications in the public sector. More than 10 countries with a high level of economic development are studying its capabilities and considering it as an option for digitizing their public services for citizens. Estonia presented the mRiik app at the World Economic Forum in Davos. It was developed on the basis of Diia. And the United States and a number of other countries are interested in developing a product similar to Diia (Sakharov, 2023).

The Kyiv Digital app is also an example of how information technology and innovation help to ensure effectiveness in war and perform socially important functions, providing significant benefits and advantages to users. It was created in 2021 to replace the Kyiv Smart City platform. The app was initially used to pay for public transportation. In a few years, it has grown into a powerful platform with many important functions for living in the capital in the context of the ongoing war: air alerts, power outages, utility bills, fares and parking, traffic, registration at the ASC, petitions and polls (Levchuk, 2024).

Since 2023, Kyiv Digital has had a feature that allows to create a request to the Kyiv 1551 contact center through the "Help" request. This is intended to speed up the ability of citizens to get answers to current city issues, such as the activities of utilities, public transportation, landscaping, etc. On November 16, 2022, at the Smart City Expo congress in Barcelona, Kyiv Digital Kyiv received the World Smart City Award Special Recognition for the application (Karlashchuk, 2023; Morgun *et al*., 2023).

A number of relevant technical equipment and re-equipment were financed for the practical implementation of Kyiv Digital: (1) UAH 365 million was spent on ground transportation equipment, software, and terminals; (2) UAH 15 million was spent on re-equipping subways and trams; (3) Software and hardware systems – UAH 60 million (Easy Pay, 2022).

The Kyiv Didital service portal also offers a number of social programs: (1) partial compensation for the purchase of a new car – provided to citizens with disabilities of groups i and ii who have lost limbs; (2) free vouchers to camps for children who have appropriate benefits; (3) housing co-financing program for Kyiv residents – provides an opportunity to receive 30% of the required down payment for a newly built apartment; (4) financial aid for students – financial support for students from families of the Heavenly Hundred Heroes or fallen defenders of Ukraine; (5) psychological support group for women who have a loved one in the military; (6) mobile emergency response team with a hotline for emergency intervention in case of conflict or crisis; (7) priority placement of children in pre-school education institutions – for children of privileged categories; (8) one-time financial assistance to low-income Kyiv residents; (9) partial compensation for electricity sources purchased for apartment buildings; (10) psychological support (400 possible locations in the city); (11) Veterans Entrepreneurship Academy at the Askold Rehabilitation Center; (12) rehabilitation of children accompanied by

an adult (the opportunity to receive a voucher for the rehabilitation of 1 adult and 1 child) (Social programs, n. d.).

In general, for 2024-2025, the Kyiv City Council approved the Comprehensive City Target Program "Digital Kyiv" for 2024-2025 by its decision No. 7516/7557 of December 07, 2023 (Kyiv City Council, 2023). The program aims to digitally transform municipal sectors and management processes through the introduction of innovations and the development of electronic information infrastructure, with a special focus on the functioning of information and communication systems and cybersecurity. The program is based on the objectives of the Kyiv City Development Strategy (sustainable urban mobility; improving the social protection of citizens; environmental safety of the capital; increasing the level of educational infrastructure in line with the requirements of the time; reducing crime; increasing the involvement of citizens in the life of the city; increasing the efficiency and transparency of city authorities and services). Funding for the implementation of the Program is provided from the Kyiv city budget and other sources, in particular, within the framework of public-private partnerships for the implementation of the project "Implementation of the system for recording violations in the field of road safety in the city of Kyiv" (Easy Pay, 2022). This program is a part of the National Informatization Program and is focused on the digital transformation of the economy and various spheres of society. In particular, with regard to the social sphere, a multifunctional electronic "Kyivan Card" was introduced in 2018. It provides benefits, surcharges, allowances, payments, compensation, targeted targeted assistance, as well as discount services and administrative e-services. After the full-scale invasion, the process of providing social services was improved through the modernization of the Social Services module, which keeps records of citizens in difficult life circumstances who have applied for support and assistance to district social protection departments. In addition, after February 24, 2022, the number of people in need of additional social care and support (internally displaced persons, war veterans, and the population affected by the war) has increased significantly in the city. All of this requires expanding the range of social services and, accordingly, promptly creating new approaches to informatization - developing digital platforms that will allow for coordination and social support. It is also necessary to ensure that citizens have access to these digital services, regardless of their social and property status and place of residence. In times of war, it is extremely important to ensure the protection of personal data and other digital information, which once again raises the issue of cyber defense and cybersecurity (Kyiv City Council, 2023).

As of 2025, more than 1,500 companies are active in Ukraine in the production of drones, electronic warfare systems, ground robotic systems, ammunition, missiles, and software. An important role in the development of this ecosystem is played by the Brave1 defense tech cluster, which has already brought together more than 3,600 innovative solutions. A particular breakthrough was the Army of Drones.Bonus system launched in 2024, which significantly changed the rules of

the game on the battlefield. Rapid development is also observed in the integration of artificial intelligence into military technologies. In particular, the first means of countering Shahed drones have already been created. Another important area of Ukraine's digitalization is education and human capital. In particular, this refers to the Mriya project in the education system – "A state educational ecosystem for students, parents and teachers that inspires learning and helps them find themselves in the modern world" (A Dream, n.d.).

The Diia portal is preparing to expand its functionality, which will include a number of innovations. These will include additional services for drivers, the ability to clear cars, change the surname online, and launch eAccounts, eNotaries, and a personal medical account. Digital services aimed at supporting veterans are being developed separately. At the same time, the platform is actively integrating AI technologies. In particular, it is planned to introduce an AI assistant that will automatically offer citizens relevant services, reducing the need to search for them in the catalog. This will become the foundation for the creation of a full-fledged state AI agent (Digital State UA, 2025).

Thus, Ukraine's digital transformation experience is an example of innovative adaptation to wartime challenges. The consolidation of government initiatives, business, and the public sector, in particular through the Diia and Kyiv Digital projects, proves the potential of digital technologies as an important driver of social change, inclusion, and national security. Ukraine's experience is also of international importance, as digital developments made by Ukrainian specialists are in demand around the world, especially in the face of growing cyber threats and the digitalization of the economy.

Discussion

Digital technologies have already become a key resource in the transformation of the governance system both in nation-states and at the level of interstate associations. Important in these processes is the need to harmonize the pace of digitalization with economic and legal aspects and institutional changes (Bereza, 2025; Thomadakis & Arnal, 2024). No less attention is paid to the development of digital infrastructure, in particular, it should be borne in mind that energy efficiency is the key to sustainable development. This once again highlights the need to develop technologies that are energy-efficient and environmentally friendly (Ushenko *et al*., 2023). The development of digital infrastructure stimulates the growth of household consumption through the renewal of the industrial structure and an increase in income (Shao, 2024). At the same time, if we talk about the digitalization of various spheres of life on a global scale, we have, on the example of developing countries, serious problems associated with the low level of digital literacy among the population. It is one of the key barriers to the integration and active use of the Internet and its capabilities to find useful information, opening

up new economic opportunities. This, in turn, can be an important factor in the development of human potential, the improvement of human capital, and will help reduce poverty, which is currently one of the global challenges facing humanity (Ali *et al*., 2023). Similarly, the problem of people's access to information and digital technologies, especially for solving social problems, remains relevant. For example, according to the Council of Europe standards, equality, dignity and equal opportunities for people with disabilities include five priority areas, including access to information, information technology and the communications sector (Lawson, 2017).

The digitalization of social services is one of the main vectors of the state's digital strategy aimed at creating an effective digital service platform. The main goal of this process is to transfer all social services from the traditional offline format to a more accessible online environment (Danyliuk *et al*., 2023).

Digitalization in general helps to accelerate business processes, stimulates innovation, and increases access to knowledge, information, and communications. Digitalization helps to optimize production processes, which in turn reduces the time and resources spent on product development and promotion. In addition, the introduction of digital technologies contributes to the formation of information bases for the effective management of large data sets, accelerates the exchange of information, transforms economic relations and adapts them to the modern needs of society (Khaustova *et al*., 2024; Mialkovska *et al*., 2023).

The rapid integration of digital technologies, while having significant potential for development, also faces many serious challenges, which are constantly and persistently discussed both from high political platforms and in the business and academic communities.

Conclusion

Social programs (n.d.) have undergone a remarkable evolution since the first legislative initiatives, such as the English Poor Law of 1601, which was one of the initial steps towards an organized social welfare system. Germany also plays a prominent role in the history of social initiatives, where an institutionalized social system of public administration began to take shape in the late nineteenth century. These measures, aimed at addressing pressing social problems, primarily poverty, especially among women and orphans, at the state level, became the foundation for modern, more complex and large-scale approaches. Today, social programs cover most countries of the world and demonstrate a wide variety of forms, depending on financing systems, management models, population coverage, and the range of services.

Modern social protection is no longer limited to direct financial or material support, but includes various initiatives aimed at providing income, implementing

socio-demographic programs, and developing healthcare. We have demonstrated this on the example of social programs initiated and supported by The World Bank. The main components of the current system are social assistance, social insurance, and employment programs that aim to support the self-sufficiency and promote independence of people in need. Many of these social programs cover different vulnerable categories, depending on the country or region: women, young people from socially vulnerable families, and people with disabilities. In particular, The World Bank Group has covered 72 countries and supported more than 220 million people with its social programs over two decades. Particular attention is paid to the digitalization of social services, which is implemented through projects such as ASPIRE, Safety Nets to Prevent Gender-based Violence, Rapid Social Response Program (RSR), and Solutions for Youth Employment (S4YE). These initiatives are actively implementing digital platforms, helping to increase the efficiency and accessibility of services for certain categories of the population.

On the European continent, digital transformation is a strategic goal in EU member states. According to the Digital Economy and Society Index (DESI, 2024). As of 2024, the average digitalization of public services for citizens was 82.32%. The leaders of digital transformation are Malta, Luxembourg, and Finland. Measures to digitalize the social sector are part of the ambitious initiative "Europe's Digital Decade", which is designed to be implemented by 2030. Its main task is to create a reliable, secure, efficient and publicly accessible digital environment. It envisages the use of digital tools to expand opportunities for education, work, leisure, health, communications, and cultural interaction. In particular, in 2021, €127 billion was allocated to support digital transformation.

Despite significant progress in the development of social programs and their digitalization, about 2 billion people on our planet are still without basic social protection or are insufficiently covered by it, especially in low-income countries (mainly in Africa and Central Asia). This calls for further expansion and improvement of programs, as well as increased cost-effectiveness through resource optimization and diversification of funding sources.

Estonia's experience after regaining state independence in 1991 is a vivid example of successful digital transformation and an innovative approach to public administration, even with initially limited and outdated technological resources. The country managed to turn the challenge of "starting from scratch" into a competitive advantage by consistently implementing ambitious digital initiatives. An important role in Estonia's success in digitalization, including in the social sphere, is attributed to its strategic vision and government support. Estonia has also become a leader in the introduction of online services – from e-banking in 1996 to 100% digitalization of all public services today. An important factor was the modernization of infrastructure, in particular, the introduction of the national platform for data integration X-Road in 2001. Much attention is paid to the protection of digital systems and platforms in Estonia, especially after the unprecedented cyberattacks in 2007. Estonia developed the KSI blockchain

technology and deployed the NATO Cooperative Cyber Defense Center in the capital. The AI Development Strategy and the launch of the first autonomous hydrogen vehicle, Liisu, confirm Estonia's desire to remain at the forefront of technological progress. Estonia has become an example of how thoughtful strategic planning, prioritizing digitalization, innovation, and attention to citizens can transform public administration. Its success is a strong example for countries seeking to implement similar transformations.

As for Ukraine, the Ukrainian IT sector is showing dynamic development, combining high professionalism of specialists, modern infrastructure and a strong startup ecosystem that is able to adapt even in the most difficult conditions, such as the Russian-Ukrainian war. Thanks to technological progress and competitiveness in the global market, Ukraine has deservedly gained the reputation of a "Digital Tiger".

Digitalization has become one of the key signs of Ukraine's resilience and efficiency, which truly surprised the world by withstanding the first days of the full-scale invasion of the Russian occupiers on February 24, 2022, and demonstrating its resistance to this day. With the introduction of e-governance and digital services, the country demonstrates a high level of functionality that remains relevant and serves as an effective tool for public administration even during the war. This is confirmed by the growing popularity of the Diia platform and application, which in 2023 was regularly used by 64% of Ukrainians, and the number of users exceeded 20 million. Through Diia, Ukrainian citizens can access more than a hundred government services, including documents and services through the mobile application. Today, experts consider Diia to be one of the most successful mobile applications in the public sector, which attracts the attention of many countries. For example, Estonia has built its mRiik platform based on Diia's experience, and the United States and other countries are considering creating similar products in their governance structures.

Another example of digital innovation is the Kyiv Digital app, launched in 2021 as a replacement for the Kyiv Smart City platform. It was initially used to pay for public transportation, but eventually became a multifunctional platform with numerous services for residents of the capital, even expanding services during the war. The app offers notifications about air raids and power outages, utility and parking payments, and access to services such as making doctor's appointments and signing petitions. Since 2023, Kyiv Digital has added the function of creating requests to the Kyiv Contact Center through the Help request, significantly speeding up the response to communal and social issues. Numerous social programs covering financial, material, and psychological areas of social work are also available through the Kyiv Digital service portal**.**

Digitalization not only updates the technical aspects of service delivery, but also transforms the very concept of social policy, combining it with information data, personalized services, and automated management methods. At the same

time, the success of these changes depends on the level of development of digital infrastructure, the digital competence of the population, and the ability of government agencies to implement the necessary institutional reforms.

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