INNOVATIVE SOCIAL SECURITY SYSTEMS: EUROPEAN EXPERIENCE AND UKRAINE'S PATH FORWARD

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ABSTRACT: This article examines innovative approaches to employee social security under accelerated digitalization and labor market transformations. The aim is to identify how digital tools and strategies can enhance the adaptability, efficiency, and inclusiveness of social security systems in Ukraine. The study employs a combination of legal analysis, comparative review, and synthesis, drawing on international experiences from the European Union and leading countries such as Sweden, Denmark, and Germany. These countries were selected for comparative analysis because they have different yet successful models of digital transformation of social security. The states combine a high level of innovation and many years of experience in implementing digital services for employees. Key findings highlight

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how digital platforms, blockchain technologies, artificial intelligence, and integrated service portals reduce administrative burdens, improve transparency, and personalize service delivery. The article analyzes the European Union's strategies, including the Digital Services Act, Digital Europe Programme, and national-level innovations. The conclusion emphasizes a holistic, human-centered approach that accounts for regional disparities, digital literacy gaps, and data protection, which should be adopted. The study's novelty lies in offering a comprehensive legal-analytical framework that synthesizes global best practices and proposes adaptive strategies tailored to Ukraine's socio-economic context. Recommendations for future research include examining the impact of AI-driven social service systems and cross-sector integration between healthcare, taxation, and social security platforms.
Keywords: Employee; Health Insurance; Innovations; Labor Law; Life Insurance; Social Security.

SISTEMAS DE SEGURANÇA SOCIAL INOVADORES: A EXPERIÊNCIA EUROPEIA E O CAMINHO FUTURO DA UCRÂNIA

RESUMO: Este artigo examina abordagens inovadoras à segurança social dos trabalhadores num contexto de digitalização acelerada e de transformações do mercado de trabalho. O objetivo é identificar como as ferramentas e estratégias digitais podem aumentar a adaptabilidade, a eficiência e a inclusão dos sistemas de segurança social na Ucrânia. O estudo utiliza uma combinação de análise jurídica, revisão comparativa e síntese, com base em experiências internacionais da União Europeia e de países líderes como a Suécia, Dinamarca e Alemanha. As principais conclusões destacam como as plataformas digitais, as tecnologias *blockchain*, a inteligência artificial e os portais de serviços integrados reduzem os encargos administrativos, melhoram a transparência e personalizam a prestação de serviços. O artigo analisa as estratégias da União Europeia, incluindo a Lei dos Serviços Digitais, o Programa Europa Digital e as inovações a nível nacional. A conclusão enfatiza uma abordagem holística e centrada no ser humano que tenha em conta as disparidades regionais, as lacunas de alfabetização digital e a proteção de dados. A novidade do estudo reside em oferecer uma estrutura jurídico-analítica abrangente que sintetiza as melhores práticas globais e propõe estratégias adaptativas adaptadas ao contexto socioeconómico da Ucrânia. As recomendações para investigação futura incluem a análise do impacto dos sistemas de

serviços sociais baseados em IA e a integração intersectorial entre assistência à saúde, tributação e segurança social.

Palavras-chave: Trabalhador; Seguro de saúde; Inovações; Direito do Trabalho; Seguro de vida; Segurança social.

INTRODUCTION

A system of safeguards known as employee social security is intended to assist and shield workers against social dangers. This system includes various forms of public and private support that provide financial, medical, and social assistance to employees and their families (Brusa; Bahmani-Oskooe, 2020; Kolotik, 2022). The main components of employee social security are pensions, health insurance, accidents, occupational disease insurance, unemployment benefits, social payments, and benefits (Setrini et al., 2022). The goals of employee social security are to uphold workers' health and well-being, establish social stability and equality in society, and provide the means for a respectable level of life (Velloso, 2006). In the case of social dangers, it helps employees and their families overcome financial obstacles to maintain a respectable quality of living. This allows workers to focus on their professional responsibilities without constant fear for their financial future. In addition, it contributes to a more stable and equal society by reducing social inequality and promoting social inclusion (Zaytsev, 2022). The level of civilization of the state and society as a whole is determined by the attitude towards the least protected and most vulnerable members in need of social protection (Shulga, Surina, 2005; Kisil, 2019).

Social security for employees has long been a crucial component of human resource management and public policy. The topic of social sphere transformation is still important today, given the growth of the digital economy (Kostyshyna, 2021). The worldwide COVID-19 epidemic has further accelerated the trend of the previous three decades, which has been a move from our info-industrial society to a digital one (Rudakova et al., 2021; Nielsen et al., 2022). The introduction of new ideas and technology, together with innovative approaches to organization and value creation, are all part of the digital transformation of service production and delivery. Social security is not exempt from this change (Murphy; Ryan, 2021).

Digital technologies have a significant impact on the structure of employment, promoting the emergence of new professions and making traditional jobs disappear (Kolotik; Herasymenko, 2023). In order to preserve social security and workers' rights, the social

security system must be adjusted to the changing circumstances. The gig economy, remote work, and freelancing are three types of employment that are growing as a result of the digital economy. In such conditions, traditional approaches to social security are not always effective, so it is necessary to create new mechanisms that will provide social protection for workers in these categories. In addition, digitalization increases labor productivity, which can increase the welfare of workers (Henman, 2022). However, it can also lead to intensification of work, increased workload, and stress (Buryk, 2025). Therefore, it is important to provide adequate social protection, including health insurance, vacation time, and mental health support.

One way to overcome the fragmentation in the way social security administrators and legislators operate is through the use of digital technologies. Due to this fragmentation, progress in related areas of social protection is often neglected. However, when aiming to provide human-centric administration and services, no social security scheme can be considered in isolation (Pieters; Schoukens, 2007). AI is one of the new and developing technologies that has the power to completely reinterpret the idea of human centricity. By moving away from a singular, administration-focused service delivery strategy and toward an integrated, multifaceted social policy approach, this redefinition improves human centricity. This method tackles several social dangers at once, which affects the person as a whole (Lee-Archer, 2023).

The conditions of the digital economy require continuous training and retraining of workers, so social security should include programs for professional development and support during periods of transition between jobs (Larsson, 2021). As digital technologies advance, there is a greater chance of data loss, privacy violations, and cyberattacks. As a result, social security should contain safeguards to protect employees from these risks by guaranteeing the protection of their personal information. Digitalization can both reduce and exacerbate social inequality, depending on how access to digital technologies and skills is distributed. On the one hand, digital tools can reduce inequality by expanding access to education, remote work, digital financial services, and information, thereby creating new economic opportunities for marginalized or geographically remote populations (Autor, 2015).

On the other hand, high-skilled workers who can complement digital technologies tend to experience productivity gains and wage growth, while low-skilled workers face higher risks of job displacement, precarious employment, or downward wage pressure (Acemoglu; Restrepo, 2020). Without adequate policy intervention, digital transformation may therefore

reinforce structural inequalities rather than alleviate them. Regardless of socioeconomic standing or area of residence, it is critical to guarantee that all sectors of the population have access to digital technology. In light of the above, social security for workers is essential to preserving societal stability and well-being in the present digitization context. It must be updated to reflect contemporary circumstances, incorporate creative solutions, and guarantee the defense of the rights and interests of all worker categories.

Ensuring the privacy and protection of employees' personal data is an important element of the digital transformation of social security systems. The amount of sensitive information collected about employees is growing significantly due to the more frequent use of automated data processing and registries. This includes data on employment, income, health, digital behavior, as well as metadata generated when using electronic services. In the absence of adequate legal and technical protection, such data may be subject to unauthorized access and abuse. This can directly affect the rights of employees and their position in the social security system.

In European Union countries, these risks are regulated by a comprehensive regulatory instrument – the General Data Protection Regulation (GDPR) (European Parliament, 2016). The document enshrines the fundamental principles of personal information processing, including minimization, purpose limitation, proportionality, transparency, and accountability. The regulation guarantees individuals a number of key rights related to the processing of their personal data. This is critically important for employees, as privacy violations can lead to unequal access to social services or other discriminatory consequences.

The introduction of artificial intelligence and automated systems into the activities of social protection agencies creates additional challenges (Kesa; Kerikmäe, 2020). Algorithmic tools are designed to identify risks, verify data, or determine eligibility for assistance. However, they can reproduce biases embedded in the original data sets (Beltran, 2025). This poses a threat to vulnerable groups. Ensuring the fairness and impartiality of algorithms is becoming an important part of protecting workers' rights in the digital environment. Transparent audit mechanisms are needed, as well as the mandatory involvement of humans in decisions that may have social consequences.

In addition, digital technologies are increasingly being used by employers to monitor the performance of job duties. Although such technologies can improve the efficiency of work organization, they create risks of excessive interference in the private lives of employees.

Therefore, modern social and labor legislation systems emphasize the need to establish clear limits on the scope and purposes of information collection, ensure proportionality of processing, and preserve human dignity in the digital environment.

Thus, the protection of personal data in the digital age is not only a legal or technical issue, but an integral element of social protection. In the context of the digitalization of social security, it becomes a component of labor rights and directly affects employees' trust in state institutions. The integration of reliable privacy mechanisms is a key condition for digital innovations to contribute to the well-being of workers rather than creating new threats or barriers for them.

Against this broader background, Ukraine becomes the central focus of the study, as its social security system is undergoing unprecedented stress and accelerated transformation. The country's "path forward" is shaped simultaneously by two powerful forces: the ongoing full-scale war, which has increased social risks, displaced millions of workers, and exposed structural gaps in social protection; and the process of European integration, which requires the harmonization of national policies with EU standards on digital governance, data protection, and social inclusion. The research therefore, seeks to answer a specific question: how can Ukraine modernize its social security system in a way that leverages European digital innovations while adapting them to wartime realities, institutional constraints, and socioeconomic needs? This perspective situates the Ukrainian case not only as a national challenge but also as a distinct testing ground for understanding how digital social security reforms function under extreme conditions.

1 METHODOLOGICAL FRAMEWORK

Several techniques were employed in order to meet the goals of the study and offer a thorough examination of innovative approaches to employee social security in the context of digitization. The primary method used in the study is the method of analysis and synthesis. This method involved dividing the phenomenon under study into its constituent elements to examine each component in detail, while synthesis was used to integrate these elements into a coherent whole in order to formulate general conclusions. The combined use of analysis and synthesis is a classical scientific approach widely applied in socio-economic and legal research to identify internal structures, causal relationships, and systemic patterns (Babbie, 2021).

Using the analysis and synthesis method, a comprehensive picture of contemporary and advanced employee social security solutions was developed by integrating insights from multiple academic, legal, and policy sources with a detailed examination of system components in the context of digitization. This method also enabled an assessment of the current state of social security systems in different countries. Importantly, analysis and synthesis were not limited to identifying isolated elements; they were used to deconstruct specific institutional mechanisms and subsequently reconstruct them into an integrated conceptual framework. Such an approach is particularly effective for studying complex, multi-level systems undergoing technological transformation.

The formal-legal method was applied to examine legal norms, their structure, content, interrelationships, and practical application. This method is traditionally used in legal research to interpret legislation and assess regulatory coherence. In this study, it was employed to analyze national and international legal acts governing social security and the use of digital technologies in this sphere. Beyond the descriptive analysis of legal sources, the formal-legal method was used to identify concrete legal tensions arising in Ukraine under conditions of rapid digitalization and wartime constraints.

This included examining the interaction between constitutional provisions, sector-specific legislation, and data protection norms. Particular attention was paid to regulatory gaps and inconsistencies, such as insufficient safeguards for automated decision-making in social benefit administration, limited regulation of algorithmic processing of personal data, barriers to equal digital access for internally displaced persons, and conflicts between accelerated digital implementation and outdated procedural rules. Such an application of the formal-legal method aligns with contemporary critical legal analysis, which emphasizes the identification of structural vulnerabilities revealed by technological change (Deakin; Markou, 2020).

The comparative method was used to identify similarities and differences between national social security systems that have adopted digital technologies. Comparative analysis is a well-established approach in legal and social policy research, particularly for identifying transferable best practices and institutional models (Ragin, 2014). In this study, Germany, Denmark, and Sweden were selected due to their representation of different European social models and their advanced levels of digital transformation in social security administration. Germany was selected for its strong legal formalism and incremental digital development, Denmark for its high level of public-sector digital maturity, and Sweden for its innovative use

of electronic identification and personalized digital social services. This diversity allows for a broader comparison of regulatory, technological, and institutional solutions. The comparative method enabled the identification of effective practices that could potentially be adapted to the Ukrainian context, considering institutional and socioeconomic differences.

In addition, the systemic method was applied to conceptualize social security systems as integrated structures composed of interdependent components. According to systems theory, this approach is particularly suitable for analyzing public policy systems undergoing structural change, as it highlights feedback loops, institutional dependencies, and functional interrelations (Duksenko; Tkachenko, 2021). In this study, the systemic method helped to reveal how digital technologies alter interactions between state institutions, service providers, IT infrastructures, and beneficiaries, including shifts from human-based decision-making to algorithmic processes and increased reliance on external technology providers.

Finally, a prognostic approach was used to assess potential future trajectories of social security systems under ongoing digital transformation. Prognostic methods are commonly used in policy-oriented research to evaluate the long-term implications of current trends and emerging technologies (Henman, 2022). In this study, this approach was applied to assess how artificial intelligence, automation, and digital platforms may influence the accessibility, efficiency, and inclusiveness of social security services in Ukraine in the medium to long term.

The combined use of these scientific methods ensured a comprehensive and interdisciplinary approach to the study of innovative employee social security models in the context of digitization. This methodological framework enabled a deeper understanding of the problem, identified systemic risks and opportunities, and outlined directions for further development of social security systems under conditions of digital transformation.

2 RESULTS

2.1 Innovative approaches to social security: Definition and main features

The ever-evolving social landscape, particularly in light of digitization and technological advancement, has led to creative methods to enhance employee social security (Mélypataki, 2020). In this context, "innovative approaches" are defined as employing cutting-edge techniques, tactics, and technology to improve the social protection system's efficiency and capacity to adjust to changing needs. Modern social protection is aimed not

only at fighting poverty through the organization of personal assistance to the poor, but also at preventing poverty. This is achieved by providing people with the opportunity to create a social protection system during their working life (Kostyshyna, 2021).

The concept of innovation extends beyond the realm of technical sciences to encompass everyday societal challenges. Innovation is not solely the domain of technical advancements; it is equally crucial on social levels. Unlike technical innovation, social innovation lacks a single, unified definition. Interpretative differences arise from varying perspectives on welfare and the novel solutions proposed for social issues (Kocziszky et al., 2017). Nevertheless, most theories converge on the idea that social innovation aims to reform societal operations and existence while enhancing the welfare of individuals within specific social contexts (Mélypataki, 2020). In our opinion, innovative approaches to social security can be defined as the integration of modern technologies and management concepts to create flexible, efficient, and personalized employee support systems. These approaches are aimed at providing an adequate response to various social risks and needs of employees in the context of a dynamically changing labor market.

Digitalization is significantly affecting the social security system and the job market. The change in the employment structure, together with the creation of new professions and the elimination of old occupations, is one of the main effects of this (Shu et al., 2023). Artificial intelligence, robots, and automation are examples of digital technologies that are altering the nature of labor, boosting productivity, but also eliminating jobs in some industries (Forde et al., 2015). In advanced economies, despite the continued dominance of standard forms of employment, there has been a notable increase in workers participating in non-standard employment, sparking concern.The increasing incidence of non-standard work is having an impact on a number of economic sectors, including manufacturing and the digital economy, in countries where standard employment has never been the norm. The ongoing problem of high levels of informality in these economies is one that this trend threatens to make worse (Berg, 2017). Digitalization-related shifts are contributing to the rise of non-traditional job models, including gig contracts, remote work, and freelancing. According to Konkolewsky (2017), these new types of work are frequently accompanied by unstable income, a lack of social protection, and restricted access to conventional social security institutions. The current social protection systems must be modified in light of this circumstance to reflect the changing nature of the labor market.

The digitization and automation of procedures, which lower administrative costs, enhance the accuracy and speed of data processing, and guarantees a more efficient use of resources, is one of the key components of the creative approach to social security (Behrendt; Nguyen, 2019). Personalization of services, achieved through the use of analytical tools and artificial intelligence, allows you to create individual social protection plans that meet the specific needs of each employee, which increases their satisfaction and the effectiveness of the services provided (Alfers et al., 2017). By offering one-stop access to a variety of assistance options, including health insurance, pensions, and unemployment benefits, the integration of social services through shared portals and platforms enhances accessibility and user experience. Employees should be given the choice of the most efficient way to access the business applications they use. Smartphones and tablets are becoming more and more necessary, so organizations and companies need to review their device strategies to meet new needs (Rudakova et al., 2021). No matter where an employee works, they can always access social services and information thanks to mobile applications and internet services. This is crucial when it comes to remote work and the gig economy (Butynska, 2019).

In this context, it is also worth noting that the transparency and accountability of social security processes are ensured by the use of blockchain technologies and other innovative methods that reduce the risks of fraud and corruption (Vinnykova, 2022). Proactivity and preventive measures implemented through monitoring and early detection of problems allow for a timely response to social risks and provision of necessary support, which significantly improves the overall efficiency of the social security system (Tylchyk; Shpak, 2019). Social security should also take into account the challenges posed by the digital divide, which affects different population groups. Workers who do not have access to the latest technologies or adequate digital skills risk being excluded from the labor market. This emphasizes how crucial it is to fund training and retraining initiatives that will enable employees to adjust to the changing demands and circumstances of the digital economy.

In addition to the aforementioned, there are many different ways that digitization is affecting the labor market and social security. To guarantee that workers' rights are protected, social security institutions are adjusted to the new environment, and digital inequality is addressed, a comprehensive strategy is needed. Within this framework, innovative social security approaches seek to develop more effective, adaptable, and employee-focused systems that can effectively address the demands of the contemporary world and enhance workers' social safety and well-being.

2.2 European Union experience of innovative approaches to social security of employees

The European Union's digitization has led to the need for social security measures that can keep up with the fast-changing labor market and guarantee that every person has access to a sufficient degree of social protection. New approaches to social policy are needed in light of the digital transformation of the economy and society, which takes into consideration the difficulties of the digital age as well as new types of employment. Developing an active labor market strategy that incorporates worker training and retraining is one of the main EU initiatives. This is essential to promote employment in the digital economy and maintain their competitiveness in the labor market. The European Union is now funding initiatives that support lifelong learning and the development of digital skills (European Commission, 2023).

Ensuring equitable access to digital technology and fostering social inclusion are crucial strategies to consider. To prevent digital inequality, this involves building the infrastructure necessary to deliver broadband internet in all locations, especially isolated and rural ones. Additionally, initiatives are in place to guarantee that vulnerable populations (the elderly and those with disabilities) have access to digital resources and services. In order to achieve this, the EU passed the Digital Single Market Strategy in 2015. The objective of this action plan is to modernize public administration, eliminate digital obstacles inside the EU, and stop further fragmentation. To provide seamless digital services throughout the EU, it incorporates the ideas of digital by default, transparency, accessibility, and interoperability (European Commission, 2015).

It is noteworthy to consider the Digital Services Act in the same framework. The purpose of this act is to increase transparency, safety, and fairness in the EU's online environment. It creates additional user protection requirements for internet platforms, such as safeguards against unlawful material, kid safety, and enhanced advertising transparency (European Parliament, 2022). The European Union also prioritizes the modernization of social protection systems, such as health insurance, unemployment benefits, and pension plans, as outlined in Regulation (EC) No. 883/2004, which addresses the coordination of social security systems. In order to preserve EU citizens' rights when they travel between Member States, this regulation lays forth guidelines for the cooperation of national social security systems. It encourages social rights to be upheld and integrated across the EU. The transparency, effectiveness, and precision of these processes may be improved by utilizing

digital technologies like big data and blockchain. As a result, administrative expenses are decreased, and social service quality is raised (European Parliament, 2004)

European Blockchain Services Infrastructure (EBSI) was introduced by the EU in 2018 in order to achieve this goal (European Commission, 2018). The European Blockchain Partnership and the EU are pursuing a major policy effort with EBSI. Its main goal is to use blockchain technology to create cross-border services that are advantageous to enterprises, individuals, public authorities, and their ecosystems. Through the use of blockchain, EBSI hopes to improve information verification and increase confidence in a variety of services provided by member countries. This effort promotes increased efficiency and dependability in the operations of the public and private sectors throughout Europe by facilitating safe and transparent exchanges (Tan et al., 2023).

Furthermore, the EU facilitates the growth of the gig economy by creating a suitable legislative framework that safeguards the rights of workers operating in this sector. Fair working conditions, access to health and social security benefits, and defense against discrimination and exploitation are all included in this. In the context of the EU's digitization, social security programs also include initiatives to boost entrepreneurship and innovation, provide new employment opportunities in the high-tech industry, and encourage the growth of a green economy. This contributes to sustainable economic growth and social stability. In particular, the Digital Europe Program (2021-2027) aims to improve digital skills among EU citizens and support the retraining of workers in digital technologies (European Parliament, 2021). It funds initiatives that promote vocational training and the development of digital competencies (Yaroshenko et al., 2023).In general, having analyzed the EU strategies in the context of innovative approaches to social security for employees, we can note the main strategies that the EU emphasizes, as shown in Table1.

Table 1. EU Strategies for Social Security in the Context of Digitalization

Strategy	Legal Act	Year	Brief Information	Significance for Social Security of Workers
Modernization of Social Protection Systems	Regulation on the Coordination of Social Security Systems (Regulation (EC) No 883/2004)	2004	Lays forth guidelines for coordinating national social security programs, guaranteeing the rights of EU nationals are protected when they travel between member states.	Ensures continuity of social security benefits for workers moving across borders, protecting their social rights and facilitating labor mobility.
Implementation of	Regulation on the	2017	Lowers administrative	Facilitates faster and

Digital Tools for Social Security Management	Electronic Exchange of Social Security Information (EESSI)		costs and enhances citizen services by introducing an electronic information sharing mechanism amongst EU member states' national social security agencies.	more accurate processing of social security claims, ensuring timely access to benefits and reducing administrative overhead for workers.
Use of Blockchain Technology for Transparency and Efficiency	European Blockchain Services Infrastructure (EBSI)	2018	Makes use of blockchain technology to provide safe information sharing between public entities and improve the efficiency and transparency of social security services.	enhances the social security system's credibility and dependability by offering an open and safe means of information sharing and verification.
Support for Digital Skills and Reskilling	Digital Europe programme (2021–2027)	2021	Intends to help workers reskill in digital technologies and improve the digital literacy of EU citizens.	Prepares the workforce for the digital economy by providing training and reskilling opportunities, thereby increasing employability and job security.
Regulation of Online Platforms	Digital Services Act	2022	Establishes comprehensive rules for online platforms, ensuring user safety, protecting minors, and enhancing transparency of online advertisements and content.	Protects workers' rights in the gig economy, ensures fair working conditions, and enhances transparency and accountability of digital platforms providing employment

As a result, social security policies in the EU's digitalization environment are complex and intended to guarantee fair, inclusive, and sustainable growth that takes advantage of the opportunities and difficulties presented by the digital age. The overall experience of the EU demonstrates that the use of digital technology into social protection systems enhances their effectiveness, transparency, and accessibility, thereby raising workers' living conditions. Other parts of the globe looking to update their social security systems in light of digitization might use this experience as a model. EU member states have their own innovations in worker social protection while still adhering to the pan-European agenda. We will next examine how these improvements are being used nationally in a few selected countries.

2.3 Examples of successful innovative approaches of individual countries to social security of employees (on the example of Sweden, Denmark and Germany)

Before moving to the analysis of specific examples, it is important to emphasize that Sweden, Denmark, and Germany were not selected arbitrarily. These countries represent three distinct European social models and, at the same time, rank among the leaders in terms of digital maturity and the integration of digital technologies into social security systems. Denmark is considered one of the global frontrunners in e-government, demonstrating the highest levels of accessibility of electronic public services, automation of social procedures, and digital interaction between citizens and the state. Sweden, in turn, stands out due to its advanced electronic identification infrastructure and the widespread implementation of personalized digital services, which ensure high transparency and effectiveness of social programmes. Germany represents a model with a strong regulatory and legal framework, combining innovative digital solutions with robust data protection standards and a gradual but steady transition towards digital administration of social services.

Analyzing these three countries makes it possible to capture a wide spectrum of approaches. This diversity offers a deeper understanding of how different institutional, cultural, and legal conditions shape the success of digital transformation in the field of social protection. Furthermore, the experience of Sweden, Denmark, and Germany is particularly relevant for Ukraine, as it encompasses both advanced technological solutions and adaptive mechanisms that account for the needs of vulnerable groups, issues of equal access, and stringent requirements for data protection. Given the current stage of digitalisation within Ukraine's social security system, examining these diverse yet effective models allows for the identification of practices most applicable to the national context and future reforms.

Sweden has demonstrated remarkable progress in digitization and the integration of cutting-edge technology into the social security system, which is why it was selected as a successful example study. Sweden is a role model for social protection to many other countries and is well-known for its creative policies aimed at enhancing the quality of life of its residents. Furthermore, the population of Sweden possesses one of the highest levels of digital literacy, which facilitates the effective use of digital solutions in a number of domains, including social security (Viberg et al., 2020; OECD, 2023).

When it comes to implementing digital technology for social security, Sweden is among the leaders. The country is aggressively addressing societal issues by utilizing cutting-edge technology like artificial intelligence and the Internet of Things (IoT). One of the

successful examples is the Digital Västerbotten project, which aims to overcome spatial inequalities in sparsely populated regions by digitizing public services. By giving rural residents access to the same services as those in cities, this program lowers expenses dramatically and raises standards of living (Löfving, et al., 2022; Yaroshenko et al., 2024).

Another example is the Swedish social security system, which includes a wide range of services from health care to unemployment benefits. The use of digital platforms to manage these services facilitates faster and more efficient processing of citizen requests, reducing administrative burden and ensuring transparency. Socialförsäkringsbalken (hereinafter – Swedish Social Security Act) governs this and covers a number of social security-related topics. It also allows for the integration of digital technology to enhance the accessibility of social benefits (Socialdepartementet, 2010).

Consequently, workers in sparsely populated regions now have access to high-quality public services like health care and social benefits, which were previously exclusively available in cities - thanks to Digital Västerbotten. Digitalization facilitates more transparent communication between citizens and government institutions by lowering administrative barriers. The use of digital platforms enables quicker processing of requests from citizens, ensuring prompt access to the required services and benefits. Therefore, the following characteristics may be applied to Swedish advances in the area of employee social security: efficiency, transparency, and accessibility.

The next country we have chosen for analysis is Denmark. The country is another leader in the digitalization of social services (Nielsen, 2019). It is known for its innovative approach to public administration and high level of social protection (Scupola, 2019; Holovkin et al., 2021). This is evidenced by the following data:

1) the country secured the first position in the EU's Digital Economy and Society Index in 2017, 2018, and 2021 (European Commission, 2022b);

2) It also topped the first place in the United Nations E-Government Survey in 2018, 2020, and 2022 (United Nations Department of Economic and Social Affairs, 2022);

3) Copenhagen ranked first in the Digital Cities Index in 2022 (Bhandari, 2022);

4) Denmark took 4th place in the Digital Governance Index in 2019 (OECD, 2020);

5) 93% of Danish internet users employed digital public services in 2021, making Denmark the country with the most citizens utilizing e-government services in the EU (European Commission, 2022a).

Accordingly, the experience of this country in the field of social protection is important for our study. One of the most successful projects in Denmark is the NemID digital identification system. This system allows citizens to access public services, including social security, with a single login (Hoff &Hoff, 2010). NemID offers unified access to a variety of services, including financial transactions and medical information, and is utilized for authorization across several platforms. The Act "On the processing of personal data by law enforcement authorities" governs the system. In order to ensure the security and usability of electronic methods of identification for citizens obtaining public services, this legislation governs their usage (Danish Parliament, 2018). This system has an important positive impact, as it simplifies access to social services by reducing barriers to receiving assistance and security. Employees can easily check the status of their social benefits, apply for assistance, and receive information about their rights. In addition, the system increases the transparency of citizens' interaction with government agencies by providing access to information and services in real time.

Another important project is Digital Post, which provides electronic communication between government agencies and citizens. This system allows citizens to receive all official notices and documents electronically, which greatly simplifies the communication process and reduces the cost of paper mail. This issue is regulated by the Law of Digital Post from Public Authorities. To ensure the dependability and security of information transmission, this legislation governs the use of email for official correspondence between people and government agencies (Agency for Digital Government, 2012). Digital Post facilitates prompt and easy access to government information, enabling staff members to get crucial papers and messages on time. Email use expedites information sharing and lowers the expense of paperwork, both of which are essential for the social security system to operate as intended (Scupola& Mergel, 2021). In conclusion, Denmark's experience shows how digital technology may be applied to provide equitable access to public services and enhance worker social protection.

Germany is actively implementing digital solutions aimed at simplifying administrative processes and improving access to social services. One of the most successful projects in Germany is the Elster system, which provides electronic tax reporting for individuals and businesses. This system allows filing tax returns and other reporting documents online, which greatly simplifies the reporting process and reduces the administrative burden. Elster allows employees and employers to file tax returns online

quickly and conveniently, which reduces the time and cost of fulfilling tax obligations. This system is based on the law on electronic tax reports (Bundestag, 2003). Another important project in Germany is the introduction of the Gesundheitskarte, an electronic health record that stores and transfers patient medical data in an electronic format. This guarantees that medical data is always available and contributes to the improvement of healthcare quality (Löfving et al., 2022). Thus, an electronic medical record was implemented in accordance with Gesetz zurModernisierung der GesetzlichenKrankenversicherung (hereinafter – German Law "On modernization of health insurance legislation") (Bundestag, 2004). It guarantees the use of electronic medical records and the sharing of medical information between medical institutions. The Gesundheitskarte offers easy access to employees' medical records in the framework of social protection for workers, facilitating access to healthcare services and guaranteeing continuity of care.

In summary, Germany has successfully implemented digital systems such as Elster for tax reporting and Gesundheitskarte for electronic health records, which have greatly increased the efficiency and transparency of social security. These developments lower administrative expenses and raise employee service standards by facilitating rapid access to healthcare and social benefits. The nations under investigation often exhibit cutting-edge methods for integrating digital technologies into the social security system, greatly enhancing the effectiveness, openness, and accessibility of social services.

3 DISCUSSION

Mélypataki, a Hungarian researcher, examines in thescholarly work how social changes and new types of employment affect the social security system. The author examines how the labor market is changing, focusing on how automation and digitalization are affecting it and how these developments provide new difficulties for the established labor laws and social security systems. This paper looks at how the gig economy and other new job models impact workers' social security benefits, which calls for social structures to change to meet these demands. The author draws attention to the need to balance flexibility and security in the labor market, especially in connection with the use of atypical forms of employment, such as freelance and temporary work. The article also examines the opportunities and challenges associated with the integration of social innovations into the labor law system, which should ensure more effective and fair social protection in the new environment (Mélypataki, 2020).

Kostyshyna, a researcher from Ukraine, came to some significant results about creative methods for social security. The paper examines creative methods for employee social security in Ukraine within the framework of the country's economic digital transition. The author points out that as digitization permeates every facet of public life and administration, new strategies for policing labor and social interactions are needed. The researcher highlights the significance of integrating information technology to boost competitiveness and the growth of the national economy, and it defines the primary conceptual approaches to enhancing social protection of employees in the context of the digital economy. The article's primary goal is to provide solutions for efficient social protection in light of the shift to the digital economy. The author examines several methods of digital transformation that enhance population well-being and foster the growth of human capital. The role of the state in fostering an environment that is conducive to the use of digital technologies in the social security industry is given special consideration (Kostyshyna, 2021).

Behrendt and Nguyen (2019), researchers from Switzerland, examine the benefits and problems brought forth by globalization, automation, and digitization. In order to provide complete and effective coverage of workers in all kinds of employment, including emerging forms like the platform economy, the paper highlights the necessity of adapting social protection systems. The emphasis is on all-encompassing methods to social security with fair and long-lasting financing mechanisms through taxes or contributions, encompassing both contributory and non-contributory systems. The researchers emphasize the importance of strengthening social systems to prevent poverty, reduce inequality, raise incomes, and ensure work-life transitions. Behrendt and Nguyen (2019) discuss policy innovations aimed at extending social protection to workers in precarious work and the self-employed. The research outlines many creative policies approach that countries are already putting into practice to modify their social security programs in response to shifting labor market dynamics. The authors emphasize the significance of social protection that is available to everyone, with a focus on gender equality, equity, and good governance. The article also examines how technology, including artificial intelligence and digital platforms, may enhance social protection (Behrendt; Nguyen, 2019).

Rudakova et al. (2021), a team of academics from Ukraine, look at how digital technologies affect social and labor interactions, as well as the labor market, in Ukraine and other countries. The researchers examine digitalization practices in Europe and Ukraine, highlighting the considerable acceleration of digital transformation in society and the

economy due to the COVID-19 epidemic. Digital technologies are now necessary for work, education, communication, and access to a wide range of services. This has created new job prospects and company ventures. The writers examine modifications to the law that encourage Ukraine's digital economy to grow. The Concept of Ukraine's Digital Economy and Social Development for 2018-2020, which outlines the primary objectives and guiding principles of the country's digital development, is specifically mentioned by the writers. As a result of digitalization, many employees have the opportunity to work remotely, which reduces dependence on physical workplaces and allows them to perform their work functions from anywhere. The article emphasizes the importance of continuously updating knowledge and skills for workers to adapt to new technologies and labor market demands (Rudakova et al., 2021).

The research of novel ways to employ social security in the context of digitization is still important, despite the abundance of scholarly studies on the topic. In particular, given that science is constantly making discoveries in the digital sphere, which has a corresponding impact on social security and requires states to constantly improve legislation and its practical implementation. The most intriguing instances of social security in EU member states were examined in the article above. However, Ukraine is also an interesting case study for us. Ukraine, like many other countries, is facing challenges and opportunities brought by digital transformation. Moreover, Ukraine is on the path of European integration, which, among other things, necessitates the adoption of European standards. In this context, it is important to research and implement best practices that will increase the extent of social security of employees, ensure transparency of processes, and reduce administrative costs.

We would like to note that in order to analyze the peculiarities of the social security system in Ukraine, it is necessary to take into account the specific socio-economic context. It was formed as a result of a full-scale war with the Russian Federation. Buryk (2025) notes that the outbreak of large-scale war caused a deep socio-economic crisis. Its consequences affected all spheres of social life. The problem of implementing effective social policy became particularly relevant, as millions of people found themselves in a state of social vulnerability. In these circumstances, social policy has become not only a tool for supporting the population but also a factor in preserving national unity, trust in the state, and social stability. Meanwhile, Vlasenko *et al*. (2023) note that the war has increased risks related to the well-being of the population. This puts pressure on the state social security system.

In addition, the increase in the number of social assistance recipients and the destruction of infrastructure have challenged the state to ensure the continuity of social services amid limited resources. In these conditions, digitalization has become a key tool for sustainability. It should be noted that the development of electronic services and automated payment mechanisms has made it possible to minimize bureaucratic barriers. This ensures the availability of social support even in high-risk areas. Thus, the current state of the Ukrainian social security system cannot be considered outside the influence of the war. It determines the priorities for reforming this system and outlines specific challenges compared to EU countries.

Numerous legislative actions, such as the Ukrainian Constitution, laws, resolutions, and regulations of the Cabinet of Ministers of Ukraine, as well as bylaws, govern social security in that country. For instance, citizens of Ukraine are guaranteed the right to social protection under Article 42 of the Constitution of Ukraine (Verkhovna Rada of Ukraine, 1996). This right includes the right to benefits in the event of a full, partial, or temporary disability, the loss of the primary breadwinner, unemployment resulting from events beyond their control, old age, and other situations as specified by law (Petryshyn; Hyliaka, 2021). The fundamental tenets and workings of the Ukrainian social insurance system, which covers unemployment, temporary disability, pensions, and industrial accidents, are outlined in the Law of Ukraine "On compulsory state social insurance" (Verkhovna Rada of Ukraine, 1999). Not to be overlooked is the Law of Ukraine "On pension provision", which governs the relationships pertaining to the payment of pensions to Ukrainian nationals who have achieved retirement age and to other legally specified groups of individuals (Verkhovna Rada of Ukraine, 1992). Only a minor portion of Ukrainian law pertaining to employee social security is shown in the list above. It is not all-inclusive and includes several other legal activities that this page will not address.

With the digitalization of the economy, Ukraine is facing the need to modernize its social security system to ensure effective and fair social protection for workers (Rudakova et al., 2021). Digital technologies provide new opportunities to improve access to social services, increase transparency, and reduce administrative costs. The introduction of innovative approaches to social security is becoming a key area for ensuring the competitiveness and sustainable development of the national economy (Sazonova; Shmalii, 2024). The creation of digital platforms for social service management is one of the key elements of digitalization. The automation of social assistance procedures made possible by

the use of digital tools greatly lowers the administrative load and boosts government agency productivity. For instance, the use of online social assistance application processes guarantees accountability and transparency in the use of public funds while enabling residents to obtain the support they need more quickly (Duksenko; Tkachenko, 2021).

The social security system is greatly impacted by Ukraine's aggressive efforts to digitalize public services (Trushlyakova, 2018). The Diia platform is a crucial instrument of digital transformation, providing individuals with online access to a wide array of governmental services. One of the main components of digital governance in Ukraine is the Diia platform, which offers several services such as document retrieval, company registration, tax payment, and much more. The public sector now has less corruption and more openness thanks to the adoption of this platform. In addition to Diia, Ukraine has also implemented a number of other digital solutions, such as the Prozorro platform for transparent public procurement and the Trembita data exchange system, which enables secure information exchange between state registries. These innovations contribute to the more efficient operation of government institutions and provide citizens with quick access to necessary services.

However, the digital transformation of Ukraine cannot be analyzed as if it were unfolding in a neutral institutional environment. Since the beginning of the full-scale Russian invasion in 2022, the social security system has operated under conditions of continuous disruption, forced displacement, and large-scale destruction of civilian infrastructure. Digital tools have become not only instruments of modernization but also emergency mechanisms that ensure the continuity of public services during wartime. The war has revealed both the strengths and vulnerabilities of Ukraine's digital governance: while digital platforms enabled millions of internally displaced persons to access benefits remotely, missile attacks on energy and communication infrastructure exposed the fragility of digital dependence. Moreover, cybersecurity threats, loss of personal data, and the need to authenticate citizens in occupied or frontline territories create challenges that have no parallels in peacetime EU digitalization processes. Therefore, any assessment of Ukraine's path toward digital social security must take into account the dual context of wartime resilience and long-term alignment with EU standards.

Nevertheless, despite these positive developments, Ukrainian society still faces difficulties. The shortage of personnel with the requisite digital skills is one of the primary obstacles to digitalization. To satisfy the demands of the current labor market, many workers -

especially those in older age groups - need to upgrade their skills and obtain further training (The Presidential Office of Ukraine, 2022). Issues can also be seen in the uneven distribution of Internet access. Opportunities for the digitization of the labor market are limited in distant and rural parts of Ukraine due to a lack of reliable Internet connectivity. This hinders the development of remote work and reduces the competitiveness of workers from these regions. In addition, the outdated technical infrastructure in many businesses and government agencies is also a significant challenge. This makes it difficult to introduce the latest technologies and processes, requiring significant investments in modernization and equipment upgrades. The issue of infrastructure has become especially critical after a full-scale Russian invasion in 2022, when large-scale destruction occurs daily as a result of missile strikes.

The digitalization of the Ukrainian labor market has great potential to improve the social protection system. It helps to increase productivity, create new jobs, and improve access to social services. However, in order to maximize these opportunities, it is necessary to overcome the challenges of digital skills shortages, unequal access to the Internet, and aging and deteriorating infrastructure. Ukraine should take into account and use Sweden's experience in digitalizing public services in sparsely populated regions. Sweden has successfully implemented the Digital Västerbotten project aimed at overcoming spatial inequalities and ensuring equal access to public services regardless of where one lives. Through considerable cost savings and improved quality of life in rural and isolated locations, this project makes it feasible to deliver the same level of services as in metropolitan areas.

If a comparable strategy were put into practice in Ukraine, people living in rural and less populated areas may have equitable access to social services, including healthcare, social assistance, education, and more. This will guarantee the sustained growth of the country, lower migration to urban areas, and raise living conditions in these areas. Government organizations may operate more efficiently and spend less on administrative overhead when providing public services through digital platforms.

CONCLUSION

Innovative approaches to social security for employees are the result of the continuous development of society in the context of digitalization and technological progress. The application of the latest technologies, methods, and strategies is aimed at increasing the efficiency and adaptability of the social protection system to modern challenges. Modern

social protection not only fights poverty through the organization of personal assistance to the poor, but also prevents poverty by providing people with the opportunity to create a social protection framework during their working life. Innovations in social protection go beyond the technical sciences to address everyday social challenges and are aimed at reforming social processes and improving the well-being of citizens.

The European Union has made significant progress in implementing innovative approaches to social security for workers in the context of digitalization. Strategies based on the use of modern technologies, such as electronic information exchange, digital identification, blockchain, and digital skills development, create the basis for a more efficient and transparent social security system. Sweden has successfully implemented the Digital Västerbotten project aimed at digitalizing public services in sparsely populated regions. This initiative ensures equal access to health and social services regardless of geographic location, reducing administrative costs and improving the quality of life of citizens. The Swedish Social Security Act provides the legal framework for the integration of these digital solutions.

Denmark is known for the introduction of the NemID and Digital Post digital identification systems, which allow citizens to access public services and official communications electronically. This greatly simplifies the process of communication between citizens and government agencies, increasing the efficiency and transparency of government processes. The Electronic Identification Act and the Digital Post Act provide the legal framework for these innovations.

Germany has developed the Elster system for electronic tax reporting and the Gesundheitskarte system for electronic medical records. These solutions simplify the tax reporting process and provide quick access to medical data, increasing the efficiency of administrative processes and the quality of medical care. The Law on Electronic Tax Reports (SteuerlicheInformationsverarbeitungsgesetz) and the Law on Modernization of Health Insurance Legislation (Gesundheitsmodernisierungsgesetz) provide the legal framework for these systems. The digitalization of the Ukrainian labor market has great potential to improve the social protection system. It helps to increase productivity, create new jobs, and improve access to social services. The introduction of digital technologies allows for the automation of routine processes, which increases the efficiency of government agencies and provides citizens with quick access to necessary services. This contributes to a better quality of life and economic stability.

However, a number of challenges need to be overcome to maximize these opportunities. These include a lack of workers with digital skills, unequal access to quality internet connectivity in remote and rural areas, and outdated technical infrastructure. Overcoming these challenges requires significant investments and reforms. Ukraine should also take into account the experience of other countries, such as Sweden, which has successfully implemented the Digital Västerbotten project aimed at digitalizing public services in sparsely populated regions. Implementation of such solutions can ensure equal access to social services for all citizens, reduce migration to cities, and contribute to the country's sustainable development. Thus, digitalization in Ukraine should become a key element of the national development strategy aimed at improving the quality of life and social security of citizens.

To move beyond general challenges and ensure real progress, Ukraine should translate digitalization goals into concrete legal and institutional reforms. First, the country should develop a unified legal framework for digital social security, including clearer provisions on automated decision-making, algorithmic transparency, and data protection aligned with EU standards. This requires amending the Law "On Social Insurance," the Law "On Mandatory State Pension Insurance," and the Law "On Personal Data Protection" to regulate digital workflows, interoperable registers, and the responsibilities of social service providers and IT administrators. Second, Ukraine should introduce a national strategy for digital social security that outlines the roles of ministries, local authorities, and private actors, creating predictable regulatory conditions for the use of AI and electronic identification tools. Third, institutional reform is needed to integrate currently fragmented social registries into a single interoperable platform, similar to Denmark's Digital Post system or Sweden's unified e-identification infrastructure. Finally, a multilevel regulatory approach is necessary to address wartime realities – ensuring access to digital services for internally displaced persons, guaranteeing offline alternatives in frontline regions, and establishing emergency data protection protocols. These legal and administrative steps would allow Ukraine not only to adopt European innovations but to build a resilient, rights-based digital social security system suited to its post-war reconstruction and EU integration trajectory.

Further research in the area of innovative approaches to social security of employees in the context of digitalization has significant potential for the development of several key areas. One important aspect is to analyze the impact of new technologies on social security. Research into the potential of artificial intelligence, blockchain technologies, and big data can

improve the transparency, efficiency, and accessibility of social services. This includes analyzing specific case studies of the implementation of these technologies in different countries and assessing their impact on the quality of social protection provision.

The social impacts of digitalization on different population groups, including older workers, people with disabilities, and people living in rural areas, also require further research. This will help to develop strategies to minimize the negative effects and ensure equal access to social services. Exploring the possibilities of integrating social security systems with other public systems, such as health care and taxation, could contribute to more coherent and efficient public services. Integration of these systems would allow for a more comprehensive approach to social service delivery and increase efficiency. Thus, further research in this area will help to expand the understanding of the impact of digital technologies on the social security system and develop recommendations for improving social protection of workers in different labor market conditions.

REFERENCES

ACEMOGLU, D.; RESTREPO, P. Robots and jobs: Evidence from US labor markets. **Journal of Political Economy**, v. 128, n. 6, p. 2188–2244, 2020. Available at: https://doi.org/10.1086/705716. Accessed on: December 11, 2025.

AGENCY FOR DIGITAL GOVERNMENT. **The Law of Digital Post from Public Authorities**. Available at: https://en.digst.dk/systems/digital-post/current-legislation-about-digital-post/. Accessed on: May 15, 2025.

ALFERS, L.; LUND, F.; MOUSSIÉ, R. Approaches to social protection for informal workers: Aligning productivist and human rights-based approaches. **International Social Security Review**, v. 70, n. 4, p. 67-86, 2017. Available at: https://doi.org/10.1111/issr.12153. Accessed on: May 9, 2025.

AUTOR, D.H.; Why are there still so many jobs? The history and future of workplace automation. **Journal of Economic Perspectives**, v. 29, n. 3, p. 3-30, 2015. Available at: https://doi.org/10.1257/jep.29.3.3. Accessed on: December 11, 2025.

BABBIE, E.R. **The practice of social research** (15th edition). Boston: Cengage Learning, 2021.

BEHRENDT, C.; NGUYEN, Q. Ensuring universal social protection for the future of work. **Transfer: European Review of Labour and Research**, v. 25, n. 2, p. 209-215, 2019. Available at: https://doi.org/10.1177/1024258919857031. Accessed on: April 13, 2025.

BELTRAN, M. AI algorithms under scrutiny: GDPR, DSA, AI Act and CRA as pillars for algorithmic security and privacy in the European Union. **Computers & Security**, v. 158. 104628, 2025. Available at: https://doi.org/10.1016/j.cose.2025.104628. Accessed on: December 11, 2025.

BERG, J. **Addressing the challenge of non-standard employment**. Available at: http://blogs.worldbank.org/jobs/addressing-challenge-non-standard-employment. Accessed on: April 28, 2025.

BHANDARI, R. **Making digital work for cities: A global benchmark for urban technology.** Available at: https://impact.economist.com/perspectives/technology-innovation/digital-cities-index-2022. Accessed on: April 11, 2025.

BRUSA, J. O.; BAHMANI-OSKOOE, M. The effect of social security on employee performance with job satisfaction as intervening variables (study from the administrative section of texas public health facilities). **Medalion Journal: Medical Research Nursing Health and Midwife**, v. 1, n. 1, p. 23-39, 2020. Available at: https://doi.org/10.59733/medalion.v1i1.11. Accessed on: May 8, 2025.

BUNDESTAG. **Straßenverkehrsgesetz**. Available at: https://www.gesetze-im-internet.de/stvg/BJNR004370909.html. Accessed on: May 21, 2025.

BUNDESTAG. **Gesetz zur Modernisierung der GesetzlichenKrankenversicherung**. Available at: https://dip.bundestag.de/vorgang/.../96707. Accessed on: April 19, 2025.

BURYK, Z. Current challenges of implementing social policy in the context of war and post-war reconstruction and in the context of sustainable development. **Public Administration Aspects**, v. 13, n. 2, p. 33-43, 2025. Available at: https://doi.org/10.15421/152518. Accessed on: December 12, 2025.

BUTYNSKA, R.Y. Influence of digital technologies on labor relations: Challenges and tasks. **Journal of Kyiv University of Law**, n. 3, p. 139-144, 2019. Available at: https://chasprava.com.ua/index.php/journal/article/download/69/66. Accessed on: May 4, 2025.

DEAKIN, S.; MARKOU, C. **Is law computable:** Critical perspectives on law and artificial intelligence. Oxford: Hart Publishing, 2020.

DUKSENKO, O. P.; TKACHENKO, V. O. The consequences of the digital economy for the economic development of the country. **Economic Development and Business Administration: Scientific Trends and Solutions**, n. 2, p. 65-66, 2021. Available at: https://er.nau.edu.ua/items/32337177-1c39-4fd4-8df9-7e174bac4d1e/full. Accessed on: April 11, 2025.

EUROPEAN COMMISSION. **Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions.** Available at: https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex%3A52015DC0192. Accessed on: March 30, 2025.

EUROPEAN COMMISSION. **Introducing EBSI**. Available at: https://ec.europa.eu/digital-building-blocks/sites/display/EBSI/Home. Accessed on: March27, 2025.

EUROPEAN COMMISSION. **Denmark in the Digital Economy and Society Index**. Available at: https://digital-strategy.ec.europa.eu/en/policies/desi-denmark. Accessed on: March 27, 2025.

EUROPEAN COMMISSION. **Digital Economy and Society Index**. Available at: https://digital-strategy.ec.europa.eu/en/policies/desi. Accessed on: March 28, 2025.

EUROPEAN COMMISSION. **Europe's digital decade: Digital targets for 2030**. Available at: https://commission.europa.eu/strategy-and-policy/priorities-2019-2024/europe-fit-digital-age/europes-digital-decade-digital-targets-2030_en. Accessed on: March 21, 2025.

EUROPEAN PARLIAMENT. **Regulation (EC) "On the coordination of social security". No 883/2004.** Available at: https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex%3A32004R0883. Accessed on: April 28, 2025.

EUROPEAN PARLIAMENT. **Regulation (EU) "Establishing the Digital Europe Programme and repealing Decision (EU) 2015/2240". No. 2021/694.** Available at: https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex%3A32021R0694. Accessed on: April 15, 2025.

EUROPEAN PARLIAMENT. **Regulation (EU) "On a single market for digital services and amending Directive 2000/31/EC". No. 2022/2065.** Available at: https://eur-lex.europa.eu/eli/reg/2022/2065/oj. Accessed on: April 11, 2025.

EUROPEAN PARLIAMENT. **Regulation (EU) 2016/679 of the European Parliament and of the Council of 27 April 2016 on the protection of natural persons with regard to the processing of personal data and on the free movement of such data, and repealing Directive 95/46/EC (General Data Protection Regulation) (Text with EEA relevance)**. Available at: https://eur-lex.europa.eu/eli/reg/2016/679/oj/eng. Accessed on: December 12, 2025.

FORDE, C.; STUART, M.; JOYCE, S.; OLIVER, L.; VALIZADE, D.; ALBERTI, G.; HARDY, K.; TRAPPMAN, V.; UMNEY C.; CARSON, C.; KATJA, J.; YORDANOVA, G. **The social protection of workers in the platform economy**. Available at: https://digit-research.org/publication/the-social-protection-of-workers-in-the-platform-economy/. Accessed on: April 16, 2025.

HENMAN, P. Digital social policy: Past, present, future. **Journal of Social Policy**, v. 51, n. 3, p. 535-550, 2022. Available at: https://doi.org/10.1017/S0047279422000162. Accessed on: May 13, 2025.

HOFF, J. V.; HOFF, F.V. The Danish eID case: Twenty years of delay. **IDIS**, v. 3, p. 155-174, 2010.Available at: https://doi.org/10.1007/s12394-010-0056-9. Accessed on: April 11, 2025.

HOLOVKIN, B. M.; TAVOLZHANSKYI, O.V.; LYSODYED, O.V. Corruption as a cybersecurity threat in the new world order. **Connections**, v. 20, n. 2, p. 75-87, 2021. Available at: https://doi.org/10.11610/Connections.20.2.07. Accessed on: April 3, 2025.

KESA, A.; KERIKMÄE, T. Artificial Intelligence and the GDPR: Inevitable Nemeses? **TalTech Journal of European Studies**, v. 10, n. 3, p. 68-90, 2020. Available at: https://doi.org/10.1515/bjes-2020-0022. Accessed on: December 11, 2025.

KISIL, O. Yu. Essence and content of social protection of police officers. **Juridical Science**, v. 6, n. 96, p. 187-194, 2019.Available at: https://dspace.univd.edu.ua/server/api/core/bitstreams/231b4957-e0f4-4fcc-a8f0-ec9faf545e58/content. Accessed on: May 31, 2025.

KOCZISZKY, G.; VERESNÉ SOMOS M.; BALATON K. A társadalmiinnovációvizsgálatánaktapasztalataiésfejlesztésilehetőségei. **Vezetéstudomány**, v. 48, n. 6-7, p. 15-19, 2017. Available at: https://doi.org/10.14267/VEZTUD.2017.06.02. Accessed on: April 11, 2025.

KOLOTIK, A. Current state of social security for employees of the National Police of Ukraine: A literature review. **Scientific Journal of the National Academy of Internal Affairs, v.** 27, n. 4, p. 52-61, 2022. Available at: http://dx.doi.org/10.56215/0122274.52. Accessed on: May 25, 2025.

KOLOTIK, A.; HERASYMENKO, O. Non-economic determinants of social and labor development - 21st. **Social and Labour Relations: Theory and Practice**, v. 13, n. 1, p.15-30, 2023. Available at: http://dx.doi.org/10.21511/slrtp.13(1).2023.02 Accessed on: June 7, 2025.

KONKOLEWSKY, H. H. Digital economy and the future of social security. **Administration**, v. 65, n. 4, p. 21-30,2017. Available at: https://doi.org/10.1515/admin-2017-0031. Accessed on: May 25, 2025.

KOSTYSHYNA, T. Social protection in the context of the development of the digital economy. **Economic Analysis**, v. 31, n. 1, p. 279-288, 2021. Available at: https://doi.org/10.35774/econa2021.01.279. Accessed on: June 3, 2025.

LARSSON, K. K. Digitization or equality: when government automation covers some, but not all citizens. **Government Information Quarterly**, v. 38, n. 1, p. 101547,2021. Available at: https://doi.org/10.1016/j.giq.2020.101547. Accessed on: June 11, 2025.

LEE-ARCHER, B. **Effects of digitalization on the human centricity of social security administration and services.** Available at: https://webapps.ilo.org/static/english/intserv/working-papers/wp087/index.html. Accessed on: May 14, 2025.

LÖFVING, L.; KAMUF, V.; HELENIAK, T.; WECK, S.; NORLEN, G. Can digitalization be a tool to overcome spatial injustice in sparsely populated regions? The cases of Digital Västerbotten (Sweden) and Smart Country Side (Germany). **European Planning Studies**, v.

30, n. 5, p. 917-934, 2022. Available at: https://doi.org/10.1080/09654313.2021.1928053. Accessed on: June 12, 2025.

MÉLYPATAKI, G. Effects of new employment forms and social innovation on social security in Hungary. **Lex ET Scientia International Journal**, v. 27, n. 1, p. 72-84, 2020. Available at: https://lexetscientia.univnt.ro/download/2020_XXVII_1_7_LESIJ.pdf. Accessed on: April 22, 2025.

MURPHY, C.; RYAN, L. National labour law and social security systems through the lens of the COVID health crisis. Adaptations or fundamental changes? **De Droit Comparé Bu Travail Et De La Sécurité Sociale**, n. 4, p. 132-143,2021. Available at: https://doi.org/10.4000/rdctss.2678. Accessed on: May 5, 2025.

NIELSEN, M. M. Governance lessons from Denmark's digital transformation. **Proceedings of the 20th Annual International Conference on Digital Government Research**, v. 19, p. 456-461, 2019. Available at: https://doi.org/10.1145/3325112.3329881.Accessed on: April 6, 2025.
NIELSEN, M. M.; RUGGIA, R.; TETLEY-BROWN, L.; DE WULF, N. **Digital inclusion: Improving social security service delivery.** Available at: https://www.researchgate.net/publication/362091904_Digital_inclusion_Improving_social_security_service_delivery. Accessed on: May 13, 2025.

OECD. **Digital Government Index**. Available at: https://doi.org/10.1787/4de9f5bb-en. Accessed on: April 13, 2025.

OECD. **Country Digital Education Ecosystems and Governance**. Available at: https://doi.org/10.1787/906134d4-en. Accessed on: April 22, 2025.

PETRYSHYN, O.V.; HYLIAKA, O.S. Human rights in the digital age: Challenges, threats and prospects. **Journal of the National Academy of Legal Sciences of Ukraine**, v. 28, n. 1, p. 15-23,2021. Available at: https://doi.org/10.37635/jnalsu.28(1).2021.15-23. Accessed on: April 17, 2025.

PIETERS, D.; SCHOUKENS P. **Social security quo vadis?** New York: Somers, 2007.

RAGIN, C. C. **The comparative method**: Moving beyond qualitative and quantitative strategies. Oakland: University of California Press, 2014.

RUDAKOVA, S.; SHCHETININA, L.; DANYLEVYCH, N.; VARSHAVA, D. Digitalization of employment relations: World experience and its implementation in Ukraine. **Galician Economik Journal**, v. 6, n. 73, p. 43-54, 2021. Available at:https://galicianvisnyk.tntu.edu.ua/pdf/73/1028.pdf. Accessed on: April 17, 2025.

SAZONOVA, S.; SHMALII, L. Strategic criteria for assessing the management of telecommunications enterprises in the digital economy. **Economics. Management. Business**, v. 1, n. 44, p. 110-118, 2024. Available at: http://dx.doi.org/10.31673/2415-8089.2024.010016. Accessed on: June 8, 2025.

SCUPOLA, A. Digital transformation of public administration services in Denmark: A process tracing case study. **Nordic and Baltic Journal of Information and Communications Technologies**, n. 1, p. 261-284,2019. Available at: https://doi.org/10.13052/nbjict1902-097X.2018.014. Accessed on: April 29, 2025.

SCUPOLA, A.; MERGEL, I. Co-production in digital transformation of public administration and public value creation: The case of Denmark. **Government Information Quarterly**, v. 39, n. 3, p. 101650, 2021. Available at: https://doi.org/10.1016/j.giq.2021.101650. Accessed on: June 9, 2025.

SETRINI, G.; HERNANDEZ, G.; MONTANÍA, C.; OVANDO, F.; RÍOS, M.; PARRA, C.; RECALDE, M.; MONTT, G. **The meaning of social security among workers in the construction industry**. Asunción: AccLab UNDP, 2022.
SHU, Y.; ZHANG, C.; DONG, W.; TAN, M. An empirical study of the impact of the digitaleconomy on social security - based on provincial panel data. **Preprint**, 2023. Available at: https://doi.org/10.21203/rs.3.rs-2804597/v1. Accessed on: March 19, 2025.

SHULGA, A.; SURINA, N. Social protection of childhood in Ukraine: Legal provision and current state (on the example of Mykolaiv region. **Public Administration and Regional Development**, n. 8, p. 618-653,2005. Available at: https://doi.org/10.34132/pard2020.08.13. Accessed on: June 4, 2025.

SOCIALDEPARTEMENTET. **Social försäkrings balken.** Available at: https://www.riksdagen.se/sv/dokument-och-lagar/dokument/svensk-forfattningssamling/socialforsakringsbalk-2010110_sfs-2010-110/. Accessed on: May24, 2025.

TAN, E.; LEROUGE, E.; CAJU, J.; SEUIL, D. Verification of education credentials on European Blockchain Services Infrastructure (EBSI): Action research in a cross-border use case between Belgium and Italy. **Big Data and Cognitive Computing**, v. 7, n. 2, p. 79, 2023. Available at: https://doi.org/10.3390/bdcc7020079. Accessed on: June 13, 2025.

THE DANISH PARLIAMENT. **The Constitution of Denmark. Act No. 410 "On the processing of personal data by law enforcement authorities".** Available at: https://www.datatilsynet.dk/Media/637998758521368022/The%20Danish%20Law%20Enforcement%20Act.pdf. Accessed on: May 27, 2025.

THE PRESIDENTIAL OFFICE OF UKRAINE. **The launch of Diia City will allow Ukraine to become the largest IT hub in Europe**. Available at: https://www.president.gov.ua/en/news/zapusk-diya-city-dast-ukrayini-zmogu-stati-najbilshim-it-hab-72753. Accessed on: May 27, 2025.

TRUSHLYAKOVA, A. B. Development of digitalization in Ukraine: Factors of influence, advantages and challenges of today. **Economic Horizons**, v. 4, n. 7, p. 186-191,2018. Available at: https://doi.org/10.31499/2616-5236.4(7).2018.212762. Accessed on: June 9, 2025.

TYLCHYK, V.; SHPAK, N. Ensuring the prevention of corruption in the context of increasing the transparency and accountability of public finances. **Entrepreneurship,**

Business and Law, v. 2, p. 133-137, 2019. Available at: https://doi.org/10.32849/2663-5313/2021.2.24. Accessed on: May 27, 2025.

UNITED NATIONS DEPARTMENT OF ECONOMIC AND SOCIAL AFFAIRS. **United Nations E-Government Survey.** Available at: https://publicadministration.un.org/egovkb/en-us/Reports/UN-E-Government-Survey-2022. Accessed on: April 19, 2025.

VELLOSO, H. **Social security in the United States: Overview and outlook**. Available at: https://repositorio.cepal.org/server/api/core/bitstreams/182211eb-3002-45b5-b44a-f305af15abfd/content. Accessed on: April 10, 2025.

VERKHOVNA RADA OF UKRAINE. **Law of Ukraine "On pension provision". No. 1788-XII**. Available at: https://zakon.rada.gov.ua/laws/show/1788-12#Text. Accessed on: May 10, 2025.

VERKHOVNA RADA OF UKRAINE. **The Constitution of Ukraine. Document No. 254k/96-VR.**Available at: https://zakon.rada.gov.ua/laws/show/254%D0%BA/96-%D0%B2%D1%80#Text. Accessed on: May 10, 2025.

VERKHOVNA RADA OF UKRAINE. **Law of Ukraine "On compulsory state social insurance". No. 1105-XIV**. Available at: https://zakon.rada.gov.ua/laws/show/1105-14#Text. Accessed on: April 20, 2025.

VIBERG, O.; MAVROUDI, A.; KHALIL, M.; BÄLTER, O. Validating an instrument to measure teachers' preparedness to use digital technology in their teaching. **Nordic Journal of Digital Literacy**, v. 15, n. 1, p. 38-54,2020. Available at:http://dx.doi.org/10.18261/issn.1891-943x-2020-01-04. Accessed on: March 28, 2025.

VINNYKOVA, N. Digital technologies in the fight against global corruption. **Political Science Issues***,* n. 41, p. 30-39,2022. Available at: https://doi.org/10.26565/2220-8089-2022-41-04. Accessed on: June 3, 2025.

VLASENKO, R. V., YATSENKO, L. Social risks of Ukraine in taohe conditions of war and post-war recovery. **Problems of Modern Transformations**, n. 7, 2023. Available at: https://doi.org/10.54929/2786-5738-2023-7-07-01. Accessed on: December 12, 2025.

YAROSHENKO, O. M; LUTSENKO, O. YE.; KARAULNA, N. V.; SOKOLOV, V. M.; ZUBRYTSKYY, M. I. Modern trends in labor law: a comparative analysis of the EU and Ukraine. **International Journal of Legal Information**, v. 51, n. 2, p. 138-149, 2023. Available at: https://doi.org/10.1017/jli.2023.28. Accessed on: May 31, 2025.

YAROSHENKO, O. M.; SEREDA, O.; HARASHCHUK, V.; MOHILEVSKYL, L.; YUSHKO, A. Non-fixed working hours in the context of globalisation: the impact of international trends on national legislation and employers' practices. **Revista Jurídica Portucalense**, v. 35, p. 238-260, 2024. Available at: https://doi.org/10.34625/issn.2183-2705(35)2024.ic-12. Accessed on: May 31, 2025.

ZAYTSEV, S. Y. Essence and significance of social protection of police officers. **Legal Scientific Electronic Journal**, n. 11, p. 887-889,2022. Available at: https://doi.org/10.32782/2524-0374/2022-11/217. Accessed on: May 17, 2025.