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Law and technology: The impact of innovations on the legal system and its regulation

Olha Zyhrii*

PhD in Economics, Associate Professor
West Ukrainian National University
46009, 11 Lvivska Str., Ternopil, Ukraine
https://orcid.org/0000-0001-7092-5306

Yuliia Trufanova

PhD in Law, Associate Professor
West Ukrainian National University
46009, 11 Lvivska Str., Ternopil, Ukraine
https://orcid.org/0000-0003-4310-3061

Liliia Parashchuk

PhD in Law, Senior Lecturer
West Ukrainian National University
46009, 11 Lvivska Str., Ternopil, Ukraine
https://orcid.org/0000-0003-2269-1626

Nadiia Sampara

PhD in Law, Lecturer
West Ukrainian National University
46009, 11 Lvivska Str., Ternopil, Ukraine
https://orcid.org/0000-0003-4958-5831

Iryna Tsvigun

PhD in Law, Senior Lecturer
West Ukrainian National University
46009, 11 Lvivska Str., Ternopil, Ukraine
https://orcid.org/0000-0002-1284-4193

Abstract. The relevance of this study is due to the introduction of technologies into the legal sphere, as well as their rapid development, which causes the inconsistency of conventional legislation with the emerging social relations. Thus, the purpose of this study was to research the impact of digital technologies on the modern legal society and their legislative regulation to formulate ways to improve and further develop this area. The methods used in this study were the following: historical, comparative legal, statistical, forecasting. The main results of this study are as follows: the concepts of technology, innovation, digitalisation, and artificial intelligence were investigated; the legal regulation of these concepts in both Ukrainian and foreign legislation was examined. The study also identified the main problems and risks associated with the use of digital technologies, including problems related to user security, personal data protection, copyright. Solutions and legislative changes regulating the field of technology were also covered using evidence from the United States of America, Switzerland, Japan, the United Kingdom, Canada. The study analysed the impact of artificial intelligence on the ethical aspects of the work of a lawyer. The study also highlighted the future vision and consequences of the use of technology in various spheres of public life. It was found that digitalisation and the introduction of technology into public spheres of life require flexibility and readiness for change from the legal sphere, as well as the need to strike a balance between innovative changes and the guarantee of fundamental human rights. Considering

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*Corresponding author

the international standards that were investigated, it was found that the key area that requires additional protection in the digital age is data privacy and confidentiality. The findings of this study can be used as a basis for improving the legislative framework that governs relations in the field of technology use by lawyers, sociologists, and legislators

Keywords: digitalisation; personal data; artificial intelligence; privacy; informatisation; legal framework

Introduction

Technology and innovation have a significant impact on social life and legal relations by changing the way people produce, provide services, access them, and interact socially. The study of technology and innovation in law is an important part of legal science and provides insight into new legal issues and challenges arising from the development of technology and helps to develop effective legal mechanisms to address them.

The problem of legal regulation of face recognition technology is analysed in the study by V.O. Goncharenko (2021), who points out that the EU countries have clear regulations and conditions for the use of biometric identification, which guarantees the protection of users' personal data. Thus, the author notes that given the European integration processes and the need to harmonise Ukrainian legislation with European standards, legislators need to introduce such conditions for the use of methods of personal identification that would be in balance with human rights, privacy, and inviolability. Such conditions, according to the researcher, must necessarily include user consent, a system of control over the implementation of such technologies.

The study by T.M. Lozynska and O.P. Yakubenko (2020) investigated the shortcomings of legal regulation of information technology. The authors pointed out that a considerable impetus for the development of the "state in a smartphone" was given by the need to introduce distance work, education, due to the pandemic. However, the researchers also note that further regulation of the sphere and consolidation of effective norms is impossible without reforming the law-making system and relying on European standards to protect the rights and freedoms of individuals in the information sphere. Such standards are constantly being updated, and therefore legislation should contain the maximum variety of social relations that may arise, be flexible, and meet the challenges of digitalisation and globalisation.

E.O. Kharitonov (2020) described the concept of information law and the relations associated with this term. The author noted that such law is defined as a certain set of rules designed to govern relations arising from and related to technology. Thus, information legal relations may arise in various traditional branches of law, including civil, commercial, criminal. In other words, almost every sphere of public life has an element of information relations, which is why there is a need to create norms that would take this fact into account.

Thus, an example of regulating the use of technology in the economic sphere is available in O.M. Goncharenko and H.B. Babadzhanian (2020). Researchers point out that the use of information technology has become a new tool for providing services, concluding contracts, supplying, and controlling the market. It is also noted that the digital economy, which is currently being actively implemented and developed in Ukraine, requires more detailed regulation to introduce an effective socially oriented economy that will enable all types of businesses to conduct business without the risks of personal data leakage, threats to privacy in the digital environment.

O. Velichko and V. Rekun (2022) analysed changes in the legal system during the active development of digital technologies. The authors point out that in practice, such changes can be observed through the streamlining of regulations at the state level in electronic access, specifically through the creation of some search services, including the official website of the Verkhovna Rada of Ukraine, the Liga resource. The article also points out that the digital era places a range of requirements on legal practice and law-making, and therefore even the rulemaking process, according to the scholars, must also undergo changes and meet the requirements of digital reality.

Considering the above, the subject matter of this study is relevant and discussed by scholars and authors. In general, the topic of technology in the legal sphere is quite extensive, which creates the need to investigate all relevant events and processes that currently have the greatest impact on the legal system and social relations. However, some problematic aspects related to the development of the legal system in the context of digitalisation, the impact of this process on the rights and freedoms of individuals, and which group of rights is at the greatest risk of infringement are still unexplored. Therefore, the purpose of this study was to analyse the role of information technology in the legal sphere, as well as to investigate the regulatory framework for innovation and digitalisation in Ukraine, and to highlight foreign practices in regulating the main current technological areas of legal development suing evidence from some countries.

Materials and methods

The study was conducted using several scientific methods. The systemic-structural method helped to cover and analyse the main concepts related to the subject matter of this study, namely, "technology", "innovation", "digitalisation", "digital law", "artificial intelligence". Along with the systemic and structural method, the study employed the formal logical method and the method of legal hermeneutics, which were used to investigate the legal acts of national and international importance, as well as theoretical developments in the respective field. The objects of this study, based on these methods, were as follows: Law of Ukraine "On Copyright and Related Rights" (2022), the Law of Ukraine "On Personal Data Protection" (2010), the Law of Ukraine "On Information" (1992), regulations, programmes, and national concepts, specifically the Recommendation of the Council on Artificial Intelligence (OECD, 2019), the Law of Ukraine "On the National Informatisation Programme" (2022).

The historical method helped to identify the key aspects of the emergence and development of digitalisation, technological, and information changes in various spheres of public life, their legal nature and specific features of regulation; to investigate the current technological advances in the legal sector and their ethical and cultural component.

The comparative legal method was useful in investigating the positive and negative aspects of digitalisation and technological development of the legal sphere, as well as in finding out foreign practices in regulating and introducing innovations into public life using evidence from the United States of America, Canada, Japan, and other countries. Highlighting measures that promote harmonisation between the observance and guarantee of security, privacy, integrity, and other human rights and between innovative processes that use biometric technologies, personal data. The comparative method was also useful in identifying the most effective solutions to the legal regulation of advanced technologies and considering them when formulating recommendations for reforming Ukrainian legislation in the area under study. Based on the data obtained using the comparative legal method and the statistical method, the study examined the state of innovation development and digitalisation in Ukraine, as well as in European countries, the United States of America. The data from World Intellectual Property Organisation (2023) was used to highlight the current state of technological development of countries.

The study identified the problems relating to the legal system under the influence of information and technological changes using the method of analysis; the study also suggested ways of solving them and further development of the sphere. Along with the method of analysis, the study also employed the method of synthesis, which was useful in investigating the effectiveness of existing instruments for regulating digital technologies and their impact on the social life of the subjects of relations arising in this area. The forecasting method was also important, as it helped to outline the future state of the sector, considering the proposed solutions to the existing problems of regulating the digitalisation process; the method also helped to propose changes to national legislation to enhance its role and effectiveness in the information sector and in the field of personal data protection, user privacy.

Results

Legal technology encompasses the use of various technological tools and innovations to improve legal practice, enhance legal processes, and facilitate better access to justice. These technologies aim to improve efficiency, accuracy, and accessibility in the legal field (de Sio & Mecacci, 2021). Legal technologies are manifested through the systematisation of documents, the conclusion of contracts remotely and according to standard algorithms, the use of artificial intelligence for legal research, drafting legal documents, providing legal advice, resolving legal disputes. The history of technology and innovation in law dates to the very origins of legal systems (Zhao, 2022). Early legal systems relied on written records, which were already a technological advance in themselves, and the advent of writing and the ability to record laws and agreements on stone tablets or papyrus scrolls marked a significant step forward in the codification of legal principles (Dunyo & Odei, 2023).

The greatest progress in the technological development of legal processes was made in the 20th and 21st centuries, with the introduction of typewriters, telegraphs, the Internet, software. The digital revolution, which began in the late 20th century and continues today, has had a profound impact on legal practice. Legal databases and online research tools have made it easier to access a large amount of legal information, court decisions, which makes legal aid activities easier, faster, and more efficient (Usman *et al.*, 2021). Electronic filing and digital signatures have simplified administrative, commercial, and civil processes, as have the use of artificial intelligence (AI) and machine learning, which have been integrated into legal activities to analyse, verify, draft documents, resolve typical disputes, predict court outcomes. The development of technology not only simplifies some processes, but also poses a range of challenges, including personal data protection issues, the need for legislative regulation and response to innovations, the development of rules that will effectively govern the relations arising from the object under study, cybersecurity, intellectual property, and copyright protection, regulation of digital identification processes, the use of AI. There is a need to analyse Ukrainian legislation in terms of its effectiveness and relevance in regulating technologies in the field of law and the readiness of the authorities to respond to global challenges associated with a considerable expansion of the ways in which innovations are used in public life.

As for the definition of information and communication technologies (ICT), it is worth referring to the Law of Ukraine "On the National Informatisation Programme" (2022), which defines the principles of national informatisation, where it is stated that ICT is the result of mental activity, a certain set of systematic knowledge, technical, and organisational decisions on the procedure for performing operations aimed at processing, accumulating, collecting and using information, providing information services. The concept of digital technologies in this regulation is presented as a set of systematic legal, organisational, and scientific solutions aimed at using various types of computing equipment to reduce the role and involvement of the user in collecting, processing, and using information. Furthermore, according to the Law of Ukraine "On the National Informatisation Programme" (2022), digitalisation is defined as the process of introducing technology into public life and all its spheres. This programme not only defines certain important terms that directly or indirectly relate to informatisation, but also makes provision for the solution of certain tasks, which include ensuring the development of the information society in Ukraine, the introduction of technologies in all sectors of the economy, social relations, public administration processes, the fight against digital inequality, digital illiteracy, the integration of the Ukrainian state into the global digital space, and ensuring the security of users and their personal data.

The logical question is how to regulate the concept of personal data and how to protect it under Ukrainian legislation. Personal data and their security are becoming a key aspect to consider when introducing certain technologies into the social, economic, political, and other spaces. For instance, the Law of Ukraine "On Information" (1992) defines personal data as a set of information about a person that can be used to identify that person. The same definition is contained in the special Law of Ukraine "On Personal Data Protection" (2010), which regulates relations related to the use of personal data. Notably, this regulation indicates the grounds, conditions, and rules for data processing, which are the foundation for guaranteeing and preserving the security of users, as the law makes provision that the processing of personal data requires the consent of the relevant subject to such a process, protection of the subject's interests, which are highly necessary. Thus, Ukraine has both general and

special legislation that lays the foundations for the protection of personal data, the definition of information technology, and the process of digitalisation. However, it is worth paying attention to which technologies and areas of information development are currently most relevant for the Ukrainian state. It is appropriate to present some statistics on the progress of global economies, including Ukraine, in terms of innovation development (Fig. 1).

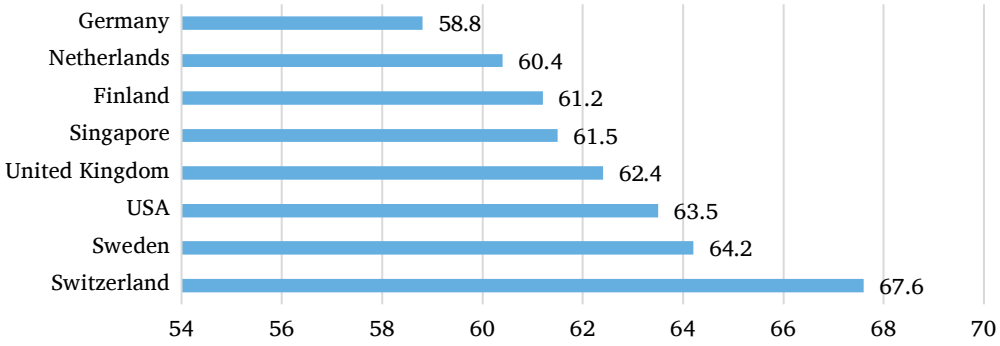

Figure 1. Global Innovation Index 2023
Source: compiled by the authors of this study based on World Intellectual Property Organisation (2023)

Thus, according to the World Intellectual Property Organisation (2023), Ukraine ranks 55th in innovation development among 132 countries, some of which are presented in the table above. Several indicators are used to generate the scores that determine a country's ranking, including, e.g., technology adoption, knowledge use, human capital, research efficiency, business organisation, digital education. It also indicates that Ukraine has improved its indicators of innovative outputs and innovative investments. These indicators mean that the number of patent applications, publications in scientific journals, production, and sales of innovative goods and services, exports, and the overall impact of innovations on the country's economic development, investment in research, development of high-quality innovation infrastructure, have increased.

In general, Ukrainian innovation in the field of law is represented by legal tech tools and the use of artificial intelligence in both the legal and general social spheres. At the state level, innovations are embodied in the Diia electronic service delivery system, the use of which is clearly regulated by special laws. However, the use of artificial intelligence and the data generated by it, specifically in legal activities, is hardly regulated, which leads to a range of problematic aspects that may affect the development of social and legal relations in general, as well as some ethical foundations for the use of AI-generated results. This issue is indirectly mentioned in the Law of Ukraine "On Copyright and Related Rights" (2022) and defines a special kind of right to non-original objects generated by a computer program. Furthermore, considering the above-mentioned law, it is allowed to use non-original objects freely, i.e., without the permission of copyright holders, free of charge, without indicating the borrowed source or the name of the author. Thus, the issue of using, e.g., OpenAI is not fully regulated by legislation, the latter does not regulate the risks that may be associated with its use and may relate to copyright infringement and does not oblige persons to indicate the source of borrowing certain data.

However, both globally and in Ukraine, the use of artificial intelligence is not limited to the above tools. Thus, there is the "Court on the Palm", "Liga. Verdictum", the Unified State Register of Court Decisions. These tools are aimed at automating routine processes, which reduces the time for the subject of the request to search and structure information, as well as increases the efficiency of its analysis and collection process (Buhmann & Fieseler, 2021). The existence of such systems would not have been possible without government support and legislative changes, and therefore it is advisable to look at some national programmes and concepts to identify advantages and disadvantages (Loureiro *et al.*, 2021). Thus, the Law of Ukraine "On the National Informatisation Programme" defines the creation of a Unified Information System of Accounting among its main tasks, the purpose of which is to form, monitor, process, and store projects and works related to the implementation of the programme and contribute to the information development of the state. The goals of the National Informatisation Programme are to ensure the information development of society, the introduction of digital technologies in all spheres of public life, as well as in public administration to simplify procedures for obtaining public services, the development and expansion of citizens' access to digital opportunities, and the integration of the Ukrainian state into the global digital space.

An important document in the legal regulation of technologies is the Concept of Artificial Intelligence Development in Ukraine, the implementation of which aims to solve a range of systemic problems related to the low level of digital awareness of the population, the lack of effective tools for regulating artificial intelligence, small amounts of investment in the development, research on artificial intelligence and its use, and the low level of involvement of the state apparatus in the use of digital technologies, specifically in the field of justice (Decree of the Cabinet of Ministers..., 2020). To achieve these objectives, it is necessary to implement international norms in the field of innovation and technology regulation into Ukrainian legislation. One of the key regulations in this area is the Recommendation of the Council on Artificial Intelligence (OECD, 2019). The guidelines are based on five core principles, including inclusive development and well-being, human-centred values and human rights, transparency in technology deployment, reliability and safety, and accountability. It is recommended that national policy and relevant decisions be made based on priority areas, including the establishment of sufficient investment in technological development, human capital development, and the creation of appropriate conditions for

this process, as well as the adoption of foreign practices and the promotion of international cooperation.

In the context of these recommendations, it is important to pay attention to the aspect of borrowing foreign practices. According to Japanese legislation, Article 2, paragraph 2 of the Basic Act No. 103 "On the Advancement of Public and Private Sector Data Utilisation" (2016), where the term "technology" is related to the concept of AI and may mean a technology for the implementation of certain intellectual functions, namely, learning, judgement, inference, which are manifested through appropriate functions and artificial means. There are opportunities to use AI in the field of forensic examinations, organisation of court activities through electronic document management, and when obtaining electronic evidence. This opens new opportunities for electronic court proceedings, specifically. Canada, for instance, adopted the Montreal Declaration for a Responsible Development of Artificial Intelligence (2018), which provides ethical guidelines for the development of artificial intelligence and focuses on consultations with experts, the public, and politicians. The use of artificial intelligence systems should contribute to the development of a democratic society, rather than reduce the responsibility of people for making certain decisions, affect the authorship and security of personal data (Schmitz & Zeleznikow, 2022).

Regarding ethical principles, it is also worth paying attention to Recommendation CM/Rec (2020) 1 of the Committee of Ministers to member states on the impact of algorithmic systems on human rights (2020). It is pointed out that states should adhere to certain principles to reduce the impact of AI and other algorithmic systems on public life and human rights. Such principles include the introduction of legislative initiatives that comply with the principles of transparency and accountability, regular assessment and monitoring of the impact of technology on human rights and freedoms to identify potential or real threats in their infancy, the implementation of a policy of education and awareness of digital development, its benefits and risks, and the approval of legislative boundaries that would guarantee the observance of human rights in the interaction with AI. It is also important to guarantee individuals the right to manage and control their personal data used by algorithmic systems.

It is also worth outlining a few more legislative decisions of foreign countries regarding the balance between technological development and reducing its impact on the legal system as a whole and on the rights and freedoms of individuals who may be involved in this process. There are separate laws at the state level, such as the California law that defines the right of individuals to refuse the use of personal data for artificial intelligence training (Senate Judiciary Committee, 2021). New York state law prohibits employers from using artificial intelligence systems to make hiring decisions to avoid bias or discrimination (Local Law of the…, 2021). At the federal level, the role in regulating artificial intelligence belongs to the Federal Trade Commission (FTC), which has published a list of powers to control and verify marketing strategies in promoting artificial intelligence, e.g., the FTC's activities include identifying misleading statements about AI capabilities, products, and services based on it.

As for Switzerland, the country's main regulation is the Digital Switzerland Strategy 2023 (Swiss Confederation, 2023). Notably, the development of the strategy involved various branches of government, as well as business, academia, and the public, which allowed for comprehensive research of the problem and consideration of all aspects of the impact of technology on various groups of society (Enholm *et al.*, 2022). The Digital Switzerland Strategy 2023 is based on five main principles, which include (Swiss Confederation, 2023):

- educational component, i.e., individuals, business and government representatives should have sufficient skills to use digital technologies safely and understand their advantages and disadvantages; security component, i.e., individuals using digital technologies and entering into relations with a digital element should be confident in the protection of their personal data;
- the legal component is the development of effective legislation that promotes the development of technology;
- the digital infrastructure component means that state representatives should use digital decision-making tools along with physical ones, so that law-making, executive, and judicial processes also move into the digital realm;
- digitalisation – the provision of public services, i.e., the transition from standard methods of resolving legal issues, processing documents, performing registration actions.

These principles are being implemented in four main areas, including access to digital services through quality Internet coverage, development of the digital economy through investment in start-ups, innovative research, strengthening digital independence and security of the country's digital environment, and creation of a digital society based on unity, inclusiveness, information literacy (dos Santos *et al.*, 2023).

It is also worth mentioning the UK, specifically, the White Papers on AI regulation, which defines a new, pro-innovation approach to AI regulation and the creation of a regulatory framework that will allow the UK to remain a world leader in innovative developments (A pro-innovation approach…, 2023). The development of the regulatory framework under the White Papers should be innovative, proportionate, robust, adaptive, and clear. These criteria are reflected in the promotion of innovative changes, avoidance of unnecessary legislative burdens and frameworks for technology businesses, strengthening public trust, addressing pressing AI-related risks, flexibility to change, new opportunities to expand the use of technology, and encouraging cooperation between different social groups. The White Papers also outline key elements that will help create an effective legislative framework for digitalisation and technology development:

- regulatory interpretation of AI should be based on its unique characteristics;
- use of a context-specific approach;
- identifying general principles of AI regulation at all levels of application;
- ensuring that there are regulatory bodies in place to oversee compliance with the law.

The White Papers also recommend defining AI based on two components: adaptability and autonomy, where the former is related to the ability of an AI system to learn, and the latter outlines the ability of AI to make decisions without human control (A pro-innovation approach…, 2023).

Thus, based on the analysis of the above-mentioned foreign solutions and strategies, it is possible to indicate some recommendations for improving the legal sphere of technology regulation to reduce the impact on social and ethical aspects of social relations in the digital era. The current national strategy in Ukraine is quite effective in terms

of the theoretical foundations and fundamental principles that guide the country's technological development. However, it is also important to envisage not only the creation of a system for collecting and evaluating projects that take place during the implementation of its provisions, but also a specialised regulatory body that would be responsible for monitoring all stages of implementation of the provisions envisaged by the strategy, as well as providing international support, consultations with foreign partners, exchange of experience. The burden on the legal system can be reduced through a preventive risk-oriented approach, which includes the identification of AI-based systems that pose the greatest risk to the rights and freedoms of individuals, the ethical foundations of social relations, specifically in the areas of healthcare, legal services. Considering the US practices, states have introduced the possibility for individuals to refuse the use of their personal data that can be used for AI training, and the US has an effective initiative at the federal level to monitor the marketing aspects of AI promotion and misleading influences on the understanding of the specifics of this system. Using evidence from the UK, it is advisable to develop a detailed definition of AI and technologies in general, which will help, firstly, narrow the range of speculations and misinterpretations around these concepts, and secondly, ensure effective legislative regulation of the sector. The UK's practices should also be used to gradually introduce fundamental principles for regulating the use of technology at all levels, including at the level of small and medium-sized businesses, enterprises, whose managers must adhere to such fundamental principles when interacting with and using technology in their activities to prevent and eliminate discrimination, prejudice, misinformation.

It should be added that Ukraine is currently a leader in the digitalisation of public service delivery thanks to the creation of the Diia service, which is regulated by special legislation and covers a range of areas of public life. However, the use of AI and its correlation with authorship issues, as well as digital literacy of citizens, which, albeit a part of the Diia functionality, has not been widely covered and promoted, require similar detailed regulation and elaboration. It is also necessary to increase investment and incentives in the development of innovative solutions at the level of private entities and initiators, the introduction of grant programmes, as well as the availability of effective and reliable legislative guarantees to ensure the protection of the rights and freedoms of persons whose relations are concluded in relation to the technological element.

Discussion

To form a general vision of the information technology sector and how its impact on the legal system has been investigated by other authors, it is worth analysing some of the studies on the relevant topics. For instance, B. Verheij (2020) explored the impact of AI on lifestyles, work performance, and the transformation of the law. In the author's opinion, this impact is manifested in the following positive aspects: automation of legal tasks, such as drafting documents, analysing them, providing legal advice, as well as drafting legislation or analysing court decisions. However, there are also potential risks of using AI, such as privacy violations, discrimination, and bias on the part of algorithmic systems. The researcher emphasises that for the successful introduction of technologies into public life and the legal sphere, it is necessary to develop ethical and social principles and safeguards to ensure that the use of AI is responsible. The author's findings coincide with those of this paper, specifically, in terms of the impact of digital development on the legal system and changes in approaches to technology regulation. Admittedly, along with the simplification of certain legal processes and their automation, the problem of the ethical use of such algorithmic systems arises, and the safety of their involvement in this area is also questionable, specifically due to the risks of personal data leakage and biased results from AI.

The issue of threats from technologies, including artificial intelligence, is well covered by G. Buchholtz (2020), who points to a range of problematic aspects associated with its use, including the lack of transparency in decision-making by such systems, possible discriminatory decisions by AI, and the lack of effective tools and legislation to regulate such systems. The author proposes to take a fresh look at the need to develop technologies and their implementation, i.e., to approach this process with caution, gradually informing the public about the feasibility of their use in the public and private spheres, as well as about the possible consequences of such use. The author's results partially coincide with the results of the present paper, but it is worth expanding on the issue of possible bias on the part of AI, as this risk is really high, specifically because the data on which AI will learn, such as court decisions, precedents, may be drafted in a standard form, contain the same approaches to resolving legal disputes, contain racial, ethnic, sexual, gender bias. Therefore, it is indeed necessary to take a careful and responsible approach to the process of involving AI or other technologies in the area of high importance, specifically, the judiciary.

P. Henman (2020) discussed ways to improve public service delivery. The author argued that AI has considerable potential in this sector, as it can automate typical routine tasks currently performed by employees, while giving them the opportunity to work on more complex and challenging issues. AI can also be used to adapt public services to the individual needs of citizens by providing recommendations, a plan for submitting or collecting documents. The author's results partially coincide with the findings of this paper but are important to consider. Notably, the digitalisation of public services is not a new issue for Ukraine, but the need to create an even wider range of e-services is still important, which is extremely relevant in the context of martial law and the displacement of many citizens outside the country.

C. Brooks *et al.* (2020) investigated the use of technology in the provision of legal services. It is pointed out that AI can meet the demand for cost-effective legal services, including free consultations that help resolve typical simple legal disputes. The authors note that the issue of introducing technology in legal enterprises or institutions is quite complex and problematic due to the cost of such a process, resistance from employees who may not perceive the innovative impact on society well and consider the possibility of replacing their profession with AI, and insufficient regulation of the use of AI by legal acts. Although the authors' results do not coincide with the results of the present paper, it is impossible to disagree with the need to implement and be open to innovative changes and trends that are currently prevailing in the world. To make such a transition comfortable and responsible, businesses need to invest in training their employees on the specific features of AI and other types of technologies, their advantages, disadvantages, consequences

of use, and how algorithmic systems can improve the service delivery process and simplify routine tasks.

The relationship between the right to personal data protection and the development of AI is discussed by N. Marsch (2020), who points out that artificial intelligence systems can be used to collect, analyse, and use personal data on a large scale, raising concerns about the possibility of AI being used for unauthorised tracking and monitoring. However, the author also points out the potential benefits of the system for data protection through the development of secure and sophisticated data encryption algorithms by AI, new tools for detecting prerequisites for data leakage. Although the findings of the researcher do not coincide with the findings of the present study, it is worth agreeing with this opinion and adding that for a safe balance between the categories under study, the fundamental principles of transparency, accountability, and fairness should be followed to ensure effective protection mechanisms, the possibility of a subject's lawful refusal to use their data.

O.B. Ayoko (2021) performed a general overview of the digital transformation process. According to the author, this process is driven by a range of factors, including the need to process large amounts of data, quick results. According to the researcher, the development of robotics and AI is an important achievement in digital transformation, as their role in the automation of industry, manufacturing, and logistics services cannot be overestimated. Although the author's results only partially coincide with the results of this paper, they are important to consider, because with the development of technology, most processes have acquired new meaning, efficiency, and usefulness precisely because of their automation using innovative approaches. The benefits brought by the digitalisation era need to be preserved and developed, while at the same time creating legislation that will reduce the risks of technology in production or service delivery.

With regard to the issue of technological development, specifically the development of AI, as a challenge for the legal system, it is worth paying attention to the study by W. Hoffmann-Riem (2020), who identified a range of problematic aspects that should be considered when creating legislation in the field of technology regulation: the issue of liability for damage that may be caused by AI systems and the subject of such liability in the person of the developer, manufacturer or user, how the confidentiality and privacy of persons interacting with algorithmic systems can be protected, how to prevent discrimination and ensure reliability. The findings of the researcher partially coincide with the results of the present study, but are important to consider, specifically because the author identifies concrete issues that are not answered in most legislative acts of the world. The solution may be to create unified international standards in this area, which will serve as a guide for the development of national regulations to regulate the use of technology effectively and comprehensively. The development of norms of an international nature has significant advantages due to the consultative approach to their creation, which leads to a greater number of approaches, opinions, and solutions of a comprehensive nature.

Conclusions

The study conducted allowed for a deeper analysis and highlighting of important aspects of the impact of technology on law and the legal system in general. It was found how the historical development of technology took place and what major events it was associated with. The study examined the terms and concepts of technology and information through the analysis of Ukrainian legislation, specifically, the Law of Ukraine "On Information", the Law of Ukraine "On Personal Data Protection". It was found that the issues of data protection and the use of artificial intelligence are only partially regulated, specifically, the Law of Ukraine "On Copyright and Related Rights" does not contain a precise definition of such algorithmic systems, does not regulate the issue of their ethical use, mandatory citation, or user security guarantees.

The study also investigated aspects related to the digitalisation and informatisation of Ukrainian society. With this in mind, two main programmes were outlined that are aimed at spreading technology in all spheres of public life and regulating the use of artificial intelligence in Ukraine. Along with Ukrainian initiatives for the country's innovative development, some international norms and recommendations were presented that should be considered during such a process; such recommendations are based on the principles of transparency, accountability, as well as fairness and responsibility, and striking a balance between innovative development and respect for fundamental human rights and freedoms. The study also clarified the issue of foreign practices that should be considered. Thus, the examples of the United States, the United Kingdom, Switzerland, Canada, and Japan show some legislative and national initiatives to regulate the technology sector and its legislative consolidation. It is proposed to pay attention to the way the US ensures user security, where state-level regulations are being introduced that make provision for the legal refusal to provide access to personal data that can be used by AI systems for training or analysis.

For further research on related topics, it is proposed to clarify the following issues: intellectual property law in the context of innovation, personal data protection in the world of the Internet of Things, legal challenges, ethical issues in the field of biotechnology and legal regulation, patenting AI, and machine learning.

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Conflict of interest

None.

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Право й технології: вплив інновацій на правову систему та її регулювання

Ольга Володимирівна Зигрій

Кандидат економічних наук, доцент
Західноукраїнський національний університет
46009, вул. Львівська, 11, м. Тернопіль, Україна
https://orcid.org/0000-0001-7092-5306

Юлія Владиславівна Труфанова

Кандидат юридичних наук, доцент
Західноукраїнський національний університет
46009, вул. Львівська, 11, м. Тернопіль, Україна
https://orcid.org/0000-0003-4310-3061

Лілія Георгіївна Паращук

Кандидат юридичних наук, старший викладач
Західноукраїнський національний університет
46009, вул. Львівська, 11, м. Тернопіль, Україна
https://orcid.org/0000-0003-2269-1626

Надія Миронівна Сампара

Кандидат юридичних наук, викладач
Західноукраїнський національний університет
46009, вул. Львівська, 11, м. Тернопіль, Україна
https://orcid.org/0000-0003-4958-5831

Ірина Мирославівна Цвігун

Кандидат юридичних наук, старший викладач
Західноукраїнський національний університет
46009, вул. Львівська, 11, м. Тернопіль, Україна
https://orcid.org/0000-0002-1284-4193

Анотація. Актуальність цього дослідження зумовлено впровадженням технологій у правову сферу, а також їхнім стрімким розвитком, що спричиняє невідповідність традиційного законодавства суспільним відносинам, які виникають. Метою цього дослідження – вивчити вплив цифрових технологій на сучасне правове суспільство та їх законодавче регулювання для формулювання шляхів удосконалення і подальшого розвитку цієї сфери. У дослідженні використано такі методи: історичний, порівняльно-правовий, статистичний, прогнозування. Досліджено поняття технологій, інновацій, діджиталізації та штучного інтелекту, проаналізовано правове регулювання цих понять в українському та зарубіжному законодавстві. Також було визначено основні проблеми та ризики, пов'язані з використанням цифрових технологій, зокрема проблеми, які стосуються безпеки користувачів, захисту персональних даних, авторського права. Рішення та законодавчі зміни, що регулюють сферу технологій, також були висвітлені на прикладі Сполучених Штатів Америки, Швейцарії, Японії, Великої Британії, Канади. У дослідженні проаналізовано вплив штучного інтелекту на етичні аспекти роботи юриста. Викладено погляд на майбутнє та наслідки використання технологій у різних сферах суспільного життя. Виявлено, що діджиталізація та впровадження технологій у суспільні сфери життя вимагають від правової сфери гнучкості та готовності до змін, а також необхідності дотримуватися балансу між інноваційними змінами та гарантуванням основоположних прав людини. З огляду на міжнародні стандарти, які були досліджені, з'ясовано, що ключова сфера, яка потребує додаткового захисту в цифрову епоху, – це приватність та конфіденційність даних. Результати дослідження можуть використати законодавці як основу для вдосконалення правової бази, що регулює відносини у сфері використання технологій, а також юристи й соціологи

Ключові слова: диджиталізація; персональні дані; штучний інтелект; конфіденційність; інформатизація; правова база