

The legal regulation of artificial intelligence security in Ukrainian banking

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Abstract: The need to expand the range of banking services in Ukraine is stipulated with technological progress, the European integration processes and the legal regime of martial law introduced in the country. Under the conditions of war, the need to strengthen the security of banking activities and protect the banking system from the influence of any internal and external factors gains meaning. The topical direction of economic and legal research of scientists today is the possibility to introduce digital technologies with elements of artificial intelligence (AI) into the banking activity in Ukraine to improve its protection. The AI law as an independent branch of the Ukrainian law has not been developed so far. The sources of AI law, its functions, tasks, scope, risks and limits of legal responsibility for prohibited practices of artificial intelligence have not been defined. The purpose of the article is to analyze the theoretical and legal provisions that underpin the regulation of AI application in Ukrainian banking. The comparative legal method made it possible, considering the provisions of the draft law on AI of the European Union, to determine the trends in the development of the legal regulation of AI in Ukraine. Following the study, proposals to the legislation of Ukraine were formulated, which will contribute to the legal regulation of banking activities using digital technologies with elements of AI.

Keywords: artificial intelligence law; martial law; banking technologies; European integration

1. Introduction

Digitization of economy requires modern innovative tools to improve the performance of some of its important sectors, minimize abuses, and create a preventive barrier against criminal offenses. The banking system of Ukraine continues to function continuously even under the conditions complicated by the operation of the martial law. Lockdown restrictions during 2019–2021 negatively affected the performance of banking institutions. Consumer demand for loans declined, and the level of debt for previously issued loans began to grow. At the same time, 2021 was characterized by positive trends for the national economy and its banking system after a long unfavorable period caused by the COVID-19 coronavirus pandemic.

The year of 2022 turned out to be quite difficult and adaptive for the banking system of Ukraine, which is due not only to a complex of internal transformations, but also external threats. The full-scale Russian invasion of the territory of Ukraine on 24 February 2022 endangered the national and economic security, territorial integrity of the state. For the banking sector of the economy, the need to find mechanisms to ensure uninterrupted operation, stability and safety of banking operations, in particular non-cash transactions, has become a priority. From the first days of the full-scale invasion

of Ukraine, under the influence of panic, consumers sought to withdraw as much cash as possible, which could adversely affect the domestic banking system.

The protection of cash deposits of citizens under the conditions of martial law can be ensured by the appropriate legal regulation of banking activity, considering certain forced restrictions provided by the applicable law. In particular, clause 2 of the Resolution of the National Bank of Ukraine, “On the operation of the banking system during the martial law” dated 24 February 2022 contains provisions on the prohibition of operations that violate the restrictions defined by the relevant resolution. Study of the possibilities to use digital technologies with elements of artificial intelligence (hereinafter referred to as artificial intelligence (AI) to ensure the convenience and reliability of banking operations under the conditions of the growing need for remote service of citizens is relevant today.

2. Review of literature

Banking activity in Ukraine is currently regulated, but there is a need to revise certain legal provisions and develop a framework for regulating new social relations arising from the advancement of AI systems. Previous scientific research on the legal regulation of banking activity did not contain any specific proposals regarding the classification of AI systems for banking activity, minimizing the risks of their application in the banking operations, prohibited AI practices in Ukraine, determining the legal status of AI and the responsibility of persons for actions involving these technologies. The lack of a unified legal act of AI systems regulation, complicates the development of sectoral legislation of states.

For instance, Bospalko (2021) analyzed the advantages and disadvantages of using AI in the judicial system in Ukraine, as well as the existing experience of various AI systems implemented in foreign countries to ensure certain processes in the field of law. Matthias (2022), assessing the prospects of Ukraine as a full member of the EU, emphasized the need to fulfill the Copenhagen criteria, among which the need to meet the economic criterion for the effective market economy is crucial. Pylypchuk et al. (2022) formulated the scientific and practical problems of finding a balance in the interaction between a human and AI, and also suggested the possibility of a specific legal status given to AI robots in the near future.

Stashchuk and Martyniuk (2021) stated that the specifics of a new banking service system with the use of AI, allows banks to save significantly on the maintenance of individual branches and reduce its personnel. An effective transition to digital banking requires high information security of customers, as a significant number of banking transactions are conducted through the network, which increases their vulnerability to unscrupulous acts. Shamoug (2022) highlighted some facts about the use of ACLED (an open-source database that effectively collects global data) to identify damaged infrastructure in Ukraine (including banking institutions) in order to determine the areas in need of emergency assistance. Fares et al. (2022) conducted a comprehensive review of the scientific literature on AI in banking and proposed to classify it into three key research areas: strategy, processes and consumers. According to the authors, this systematization of sources of information about AI will contribute to bridging the gap between academic research and industry knowledge and will

enable the development of a structure of artificial intelligence banking services.

Borges et al. (2020) performed a critical review of the literature related to the AI integration into organizational strategy, highlighting the potential benefits, challenges, and opportunities of AI use. Addressing the issue of legal regulation and simulation of adverse situations with the involvement of AI, some scientists adhere to the opinion that the responsibility of the so-called “electronic person” cannot be considered in the context of the traditional understanding of legal responsibility, i.e., by analogy with the responsibility of a natural person (Kostenko et al., 2023).

It should be noted that the authors’ significant work did not cover the issue of introducing digital AI technologies into the domestic banking system during the period of martial law. Uncontrolled use of AI can give rise to legal and ethical risks and threats to basic human rights. Legal risks mean that AI systems, analyzing a significant amount of information about consumers, may conflict with established data privacy regulations in the near future due to the lack of unified legal regulation of social relations formed under the influence of AI technologies. The essence of ethical risks is that, for example, cyber-attacks may happen in the process of banking with the use of AI, during the processing of confidential data, and the relevant data will be disclosed and used for unethical purposes.

Legal regulation regarding the use of AI is in the process of development, and the state policy in the field of AI in Ukraine is uncoordinated. This complicates the preparation of sectoral legal framework for the use of AI systems, in particular for the banking sector of economy. The draft law on the AI regulation (European Commission et al., 2021) was proposed by the European Commission on 21 April 2021. The draft law on AI of the European Union defines the general mandatory requirements for the design and development of AI systems before they are placed on the market, which will be put into effect through harmonized technical standards. However, only on 14 June 2023, the European Parliament adopted a compromise text of the EU Law on AI with relevant additions. The EU Law on AI, after its adoption, will be the first international act regulating the use of AI systems. The strengthening of digitalization processes and the introduction of new financial technologies into the banking sector of the Ukrainian economy is due to a number of significant factors.

The first factor is the need to adapt the banking sector of economy to work under the conditions of martial law. Due to the mass migration of consumers of banking services out of Ukraine, the volume of banking transactions has decreased. Fewer consumers visit bank branches physically, preferring remote banking services instead. Since the beginning of the full-scale Russian invasion and as of 14 June 2023, 6,303,500 people are officially registered as requesting for temporary protection or similar national protection systems in the EU. From the day of the full-scale invasion on 24 February 2022, 13,941,200 citizens of Ukraine crossed the borders of the EU (Operational Data Portal, 2023). The banking institutions of Ukraine have lost not only a part of their customers, but also a part of their staff due to forced migration or mobilization. It should be stated that the network of bank branches has reduced. In particular, in 2022, the number of branches of 65 banks of Ukraine decreased by 20% from 6685 to 5336. As a result of the occupation of the southeastern territories of the country, the closure of these 1349 branches significantly exceeds the figure of 2021, when 449 bank branches were closed (YouControl, 2023).

The second important factor in activation of digitalization of banking activity is the influence of European integration processes. On 17 June 2022, the European Commission recommended granting Ukraine the status of a candidate for EU membership, and on 23 June 2022, the European Parliament adopted a resolution on the immediate granting of EU candidate status to Ukraine (European Council, 2022). Requirements were defined as prerequisites for Ukraine's accession to the EU in the future. Among the three key criteria provided by the Copenhagen criteria (European Commission, 1993), the second one—the economic criterion—provides for the effective market economy of the country and the ability to resist competition and market forces (Matthijs, 2022), which will contribute to the fulfillment of Ukraine's obligations under international treaties, in particular according to the Association Agreement between Ukraine and the EU. In addition, on 23 February 2023, Ukraine approved draft law No. 0187, "On the ratification of the Agreement between Ukraine and the European Union on the Participation of Ukraine in the European Union Program", "Digital Europe" (2021–2027) (hereinafter the program) (Verkhovna Rada of Ukraine, 2023), which involves the development of projects in the following areas: supercomputer, artificial intelligence, cyber security, digital skills, as well as ensuring the wide use of digital technologies in the economy and society. It is obvious that joining the Program will have a positive effect on the implementation of digital projects in Ukraine and cooperation with international partners within the framework of projects implemented based on the principles of EU digital legislation.

In addition to the above, Ukraine is a member of the Special Committee on artificial intelligence of the Council of Europe. Back in October 2019, the country joined the recommendations of the Organization for Economic Cooperation and Development on artificial intelligence (OECD, 2019). An important action to remove obstacles in the use of new digital financial instruments and guarantee that the relevant technologies fall under the scope of financial regulation and operational risk management mechanisms of firms operating in the EU was the official publication of the law on the market in crypto assets (hereinafter-MiCA) (Official Journal of the European Union, 2023). The corresponding law was published on 9 June 2023 in the official journal of the EU and takes effect 20 days after its official publication, and enters into force on 30 December 2024. The law on MiCA aims to support innovation and the adoption of new financial technologies while ensuring proper protection for consumers and investors. In connection with the European integration processes strengthening in Ukraine, the EU Law on AI, after its adoption, will also become the basis (model law) for the development of relevant legislation at the national level. It is obvious that the EU Law on AI will have a unified character for EU states. Therefore, scientific research in the field of legal regulation of AI technologies for the needs of various sectors of society at the national level is very timely.

3. Methodology

The authors explore the current state and the prospects of development of AI legal regulation in the banking sector of Ukraine. The methodological basis of the article is a set of techniques and methods of scientific cognition.

As a general scientific method, a systematic approach is used, which allowed us

to determine the problematic issues of adaptation of the Ukrainian legislation to the international legislation and to the provisions of a European approach to AI regulation development and the current state of implementing EU *acquis* into Ukrainian legislation. The application of this method led to the study of internal cause-and-effect, hierarchical, structural-functional, direct and reverse relations, which made it possible to reveal the complex processes of banking development in Ukraine in the terms of martial law and to identify the nature of the certain economic processes. The appropriate method made it possible to carry out a comprehensive analysis of the legislation of Ukraine and identify several problematic issues related to the lack of an established definition of AI for use in the legal sense, debatable issues regarding the status of AI in the criminal sense, the possibility of granting AI the status of a subject of intellectual property rights. The formal-logical method made it possible to analyze the trends in the development of Ukrainian legislation regarding the legal regulation of AI from the point of view of compliance with the rules of rules of the norm-making technique. The methods of legal logic were used during the development of proposals for the legal regulation of AI technologies in Ukraine for the needs of banking under the influence of the dynamic development of digital technologies.

The comparative legal method allowed to compare the separate provisions of Ukrainian banking legislation with the existing provisions of the banking security of EU. This allowed to conclude that the existing economic and legal categories are, to a certain extent, interrelated and interdependent. The authors also addressed the separate provisions of the relevant legal journalism, which can contribute for the development of the proper system of legal regulation of AI in Ukraine to ensure the high level of security of in the field of banking.

4. Findings

The martial law introduced in Ukraine necessitated the development and implementation of effective means of protection for all spheres of social life, including banking. After the full-scale Russian invasion, the Ukrainian banking system must ensure uninterrupted payments and consumer access to all types of banking services, and urgently adapt its operation to the conditions of martial law. The operation is complicated by a number of significant circumstances and adverse consequences rising out of military events. The number of bank consumers has decreased due to the migration of a part of the population out of Ukraine, and banking institutions have lost part of their staff that moved abroad or within Ukraine to other regions; and there have been periodic attempts of large-scale cyber-attacks to the domestic banking system. In such conditions, there appeared a need to implement innovative solutions related to the maximum digital transformation of banking services and digitization. This direction should open new opportunities for remote work with clients, maintain a high level of customer service, and maintain the demand for banking services among Ukrainians who are temporarily outside the country. The application of AI technologies in banking is capable to upgrade the national market of payment services and form a new paradigm of security for the operation of banking institutions.

In accordance with the Concept for the Development of Artificial Intelligence in Ukraine (hereinafter referred to as the concept), AI is defined as an organized set of

information technologies that can be used to perform complex tasks through the use of a system of scientific research methods and information processing algorithms obtained or independently created during work, and also create and use its own knowledge bases, decision-making models, algorithms for working with information and determine ways to achieve the set tasks (Verkhovna Rada of Ukraine, 2020). The mentioned concept does not include a classification of AI types, the scope and limits of its application; instead, its content outlines a scope of problems requiring solution, while some of them can be solved in a relatively short time. For example, this refers to the provision of non-availability of professional development programs for lecturers of higher educational establishments in the field of AI. On the other hand, solving some security problems requires fundamental optimization of Ukrainian legislation and the adoption of an up-to-date legal framework that would create real conditions for the implementation of global AI practices. In the working version of the strategy for the AI development in Ukraine for 2022–2030, artificial intelligence is defined as a system of algorithms and programs for generation of new knowledge and solution of creative tasks created and controlled by the artificial consciousness of a computer (Shevchenko, 2022). We believe that, first, there is a need to use a unified concept of AI for Ukrainian legislation to avoid disagreements regarding the its perception.

It's worth to mention, that the updated Strategy of Ukrainian Financial Sector Development (2023) contains certain essential provisions that determine the future trends of the development of the financial sector of Ukraine. Moreover, the vision and mission of the financial sector of Ukraine are logically formulated in the context of implementation of EU legal acts (EU *acquis*) in the field of financial services. In particular:

- It was carried out the initial assessment of the state of implementation of EU legal acts in the field of financial services to identify the inconsistencies to be eliminated within the framework of accession of Ukraine to the EU;
- The implementation of EU *acquis* acts has been ensured as a result of the update of the Association Agreement between Ukraine and the EU;
- The proposals for the national program for the implementation of Ukrainian legislation to EU Law in the area of financial services have been prepared in terms of integration into single internal market of financial services of the EU (National Bank of Ukraine, 2023).

Section III of the relevant strategy is entitled, “Goals, objectives, and methodology of Ukraine’s financial sector development strategy”. Among the five main goals defined in the corresponding section of the strategy, goal 4, “Modern financial services” is of significant importance for the further implementation of AI technologies in banking of Ukraine.

In particular, in part of the defined sub-goals of development of infrastructure for digital financial services and automation and paperless technologies in provision financial services, digital defense of the financial sector. In particular, the development of infrastructure for digital financial services and automation and paperless technologies in the provision of financial services, digital defense of the financial sector is defined as part of the sub-goals.

Innovations aimed at the best service to consumers, including ensuring a high level of security of banking transactions, should attract potential bank customers and

facilitate citizens' access to cashless banking transactions. Innovative AI technologies today allow banks to use various methods for improvement and launch of banking products. The innovation process in a banking institution connected with the development and implementation of certain innovations covers various stages of banking, starting from the development of the concept to the immediate practical implementation. Banks, as a rule, either improve existing services or introduce new ones that have not yet been tested at the market of banking services of Ukraine. Breakthrough banking products using AI technologies at the stage of initial implementation might not bring any profits to the bank, but will contribute to the growth of its positive image and development of the banking industry. AI technologies in the banking sector of Ukraine have been implemented at a certain level, and the scope of their application is gradually covering more and more banking services.

Bank chatbot services enable to pay for services, receive notifications about the transaction status, and carry out banking transactions in a messenger convenient for consumers. The chatbots' operation is based on such a type of AI as natural language processing (NLP) (Lutkevitch and Burns, 2023), which is used to replace operators. Also, bank customers do not always contact banks by phone, they can use convenient messengers that have certain advantages, because the chat platforms store the history of requests, give immediate answers to users' questions, and create individual offers for customers. The opportunity to apply in writing through a chatbot without the need to make calls to the bank and sometimes wait for a long time also provides a more comfortable service for consumers. For example, Mastercard uses the KAI chatbot. The relevant services are actively used by PrivatBank and other banks of Ukraine. The use of mobile banking applications with AI elements, for example, FacePay in Privat24 allows payment using the user's face with additional confirmation in the bank application. A certain level of security could also be provided by biometric identification (Kurylo et al., 2021).

Ukrsibbank (2022) is testing the Khmarka chatbot, which can recruit personnel, remind employees about the sequence of actions in certain situations, and conduct a parallel polling among a large number of respondents.

Video analytics as AI-based video analysis software currently allows banks to analyze videos and identify emerging objects. This technology is to a certain extent effective in identifying persons who have committed criminal offenses related to banking activities. AI technologies are used to detect fraudulent activities in the use of bank payment cards, in particular, for better identification of socially dangerous acts committed by persons in the banking sector.

Advances in AI technologies enable the banks to automate and accelerate processes of 24/7 customer service (even on weekends and holidays). The banking institutions cut their costs owing to the reduction of their staff and the improved efficiency of certain activities, since AI technologies do not get tired, do not get sick, do not need leaves and wages. Moreover, there is no emotional human component, which makes under certain circumstances the artificial operator works exclusively in accordance with the settings without any personal interest, which can contribute to the minimization of corruption abuses in the banking sector. On the example of the automated system of document flow of courts (ASDC) in Ukraine, where lawsuits received by the court office are later distributed for consideration by an impartial

automated system among judges without the involvement of the president judge in this process, which allows to diminish official abuse.

Another ability of AI is the management of social media of banking institutions for the purposes of effective marketing. In particular, Oschadbank in Ukraine started to manage social media using ChatGPT technology (Burnyak, 2023). Currently, the testing of posts with informational content and visual design created with AI technologies is carried out.

Risk management for retail lending decisions is another opportunity for AI technologies in banking. In particular, modern innovative scoring systems examine information about the bank consumers using AI and machine learning technologies. The results of examination enable the bank to determine the borrower's creditworthiness, considering the level of their income, education, marital status, previous credit history and other circumstances.

Aladdin Platform—the development of BlackRock international investment company—could be another prospect for the further implementation of AI technologies in Ukraine. A risk-adjusted system based on AI technologies can benefit the economy of Ukraine at the stage of rehabilitation and recovery after the lifting of the martial law. Aladdin platform can effectively work with a significant volume of customers, large sums of money. It should be noted that AI-based chatbots are currently effectively used not only in the banking sector of Ukraine, but they are also applied to improve interaction with clients of state bodies, for example, “Ukrposhta” Private Joint Stock Company (PJSC) and “Kyivvodokanal” Private Joint Stock Company (PJSC).

Summarized information on certain types of AI technologies used in Ukrainian banking is given in **Figure 1**.

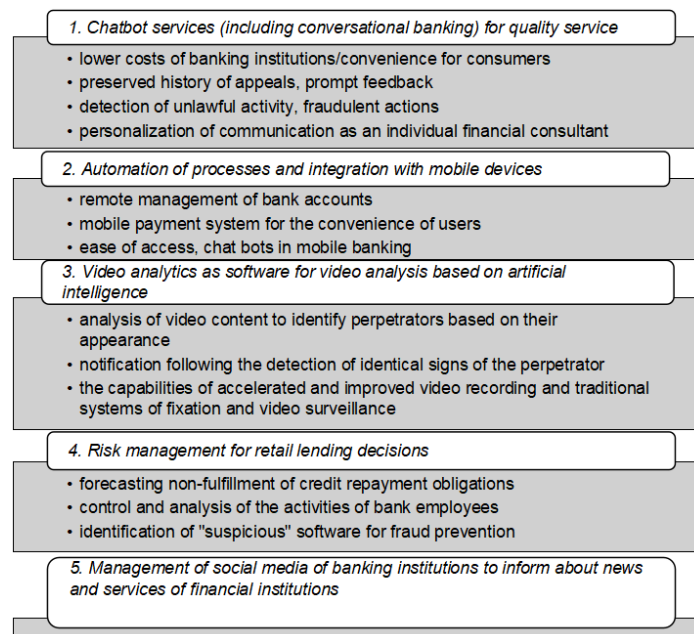


Figure 1. Certain types of digital technologies with AI elements that are applied in the Ukrainian banking.

5. Discussion

The unlimited abilities of AI systems initiate a discussion about digital rights of people. Global digitization should not cause the regression of human rights. Digital rights are human rights to access, use, create and publish digital works, and to access and use computers and other electronic devices, communication networks, including the Internet. According to the provisions of article 8 of chapter III, “Freedom of choice” of the European Declaration on Digital Rights and Principles (European Commission, 2022) of the Digital Decade, AI should serve as a tool for people, the ultimate goal of which is to improve well-being of humans.

An important issue is the legality of use of certain types of AI technologies, the development of AI ethics standards, since the uncontrolled development of relevant systems can cause unpredictable risks for civilization. In this regard, the intensive development of AI systems requires timely legal regulation, compliance with the principles of the rule of law. Counteraction to socially dangerous consequences to the environment and universal values of legal protection is of great importance. In case of any adverse consequences caused with the use of prohibited AI practices, the mechanisms of prosecution for such actions should be developed and should have a unified character for the legal systems of most civilized states. Since unification is a process of convergence of the legal systems of the world, one of the directions of international unification of legislation is the listing of offenses that are dangerous for the international community and require international cooperation for combating.

A logical question that arises in the settings of digitalization, the expansion of algorithms and the capabilities of machines is the protection of human rights, the legal status of AI, and setting of safe limits for the use of AI systems in various spheres of social life. The question of the feasibility and safety of biometric technologies used in combination with AI technologies is already questionable, since restrictions on the use of biometric data are provided for in the draft EU Law on AI. Therefore, it is expected that in the future the issue of systematization and processing of biometric data of citizens with the AI systems will be minimized, considering the existing risks of their improper use. Harmful AI practices are defined in the draft EU Law on AI as being contrary to EU values. Art. 5 of the draft EU Law on AI classifies the use of remote “real time” biometric identification systems in public places for the purpose of law enforcement activities as prohibited AI practices, even for the purpose of their use by law enforcement agencies (European Commission et al., 2021).

It is also necessary to consider the risks that may be caused by the access of generalized strong AI to the biometric data of a natural person. The consequences can be unpredictable and socially dangerous, turn into the unlawful use of a person’s biometric data and the creation of very sophisticated deepfakes. Restrictions on the use of biometric data in the draft EU Law on AI refer to certain areas and types of activities, which theoretically can be socially useful. This refers to the inadmissibility of using AI systems to identify persons who are suspected of a criminal offense, and to determine the characteristics of their behavior and state of mind.

It should be noted that deepfakes belong to quite dangerous technologies, which are created through synthesis of an image of a certain person based on AI technologies. Deepfakes can be used to compromise individuals. Under the conditions of the martial

law in Ukraine, their distribution can be regarded as part of the tactics of information warfare and propaganda. The technology is based on the mechanism of superimposing images on video to create a seemingly real video clip with information that can influence public opinion. For example, in 2022, a deepfake appeared on the Internet with an alleged message from the President of Ukraine, Volodymyr Zelenskyi, about the laying down of weapons and the surrender of Ukraine (Lutsenko, 2022). Later, the Center for Strategic Communications and Information Security in Ukraine (hereinafter-CSCIS) confirmed information that the relevant video is a deepfake and was edited with AI technologies.

As already noted, the European Parliament adopted a compromise text of the EU Law on AI with the relevant additions. Amendment 647 of the relevant text of the law states that non-compliance with the ban on the AI practice specified in Art. 5 of the law on AI is subject to administrative fines of up to EUR 40,000,000 or, if the offender is a corporation, up to 7% of its total global annual turnover for the previous financial year.

Another important provision of the draft EU Law on AI is the issue of the use of intellectual property. Copyright on items created by AI is not regulated in Ukraine. In addition, the risks caused by the unlawful use of AI systems should also be regulated and provide the responsibility of the developers of the relevant technologies.

Currently, Ukraine has developed a working version of the Strategy for the Development of Artificial Intelligence in Ukraine for 2022–2030 (Shevchenko, 2022). Chapter 7 of the mentioned strategy is devoted to the implementation of AI in the priority areas of Ukraine's development. The authors name the following areas: security and defense, research and education, medicine, industry and energy, telecommunications, transport and infrastructure, agriculture. At the same time, no attention is paid to the application and development of AI technologies in the banking sector. The elaboration of the AI development strategy for Ukraine and its subsequent approval are important tasks that must be addressed as soon as possible in order to ensure the digital transformation of the economy and the development of the state (Shevchenko, 2023). At the same time, there is a need to develop a target strategy for the development of the banking sector using AI technologies for the coming years. This strategy should list the types of AI-based digital technologies that are used, tested and should be introduced into the domestic banking sector. In addition, the structure of the specified strategy should include up-to-date information on the principles of the legal regulation of AI in Ukraine.

There is a logical need to optimize certain provisions of the Law of Ukraine “On banks and banking activity” (Verkhovna Rada of Ukraine, 2001), in particular, part 2 of the said law—in the part of definitions—should be supplemented with a definition of “artificial intelligence technology” and its appropriate explanation. Chapter 8 “Requirements for bank activity” of the Law of Ukraine “On banks and banking activity” does not contain any information about the admissibility of using AI technologies in the provision of banking services. There are no legal grounds for the use of digital technologies with AI elements in banking. It would be logical in this context to supplement part 1 of Art. 47 “Types of bank activities” of the mentioned Law with the following wording: “The bank also has the right to provide banking services and other financial services using artificial intelligence technologies.”

Currently, technology advances are used not only for useful purposes, but also for socially dangerous acts. Therefore, the effective Criminal Code of Ukraine (hereinafter the CCU) contains chapter XVI “Criminal offenses in the field of use of electronic computing machines (computers), systems and computer networks and telecommunication networks” (Verkhovna Rada of Ukraine, 2001). The corresponding chapter XVI appeared in the effective Criminal Code of 2001, but was absent in the Criminal Code of the Ukrainian SSR adopted in 1960. This section appeared with the development of social relations and technical progress, which contributed to the criminalization of the relevant social relations. Offenders take advantage of technology innovations, having access to volumes of structured data, the corresponding software and expertise. Dupont et al. (2018) note that specific software and online courses with instructions for using AI are freely available. There is an extensive criminal data market, and the equipment of enough capacity at a moderate price is available on the legal market, which allows to expect the use of AI technologies for unlawful purposes (Dupont et al., 2018). Some scientists, in particular, Radutnyi considers AI as an offender, noting that the virtualization of a part of human life is obvious in the near future, which undoubtedly involves the use of AI. At the same time, the scientist defines AI as an electronic personality that can be endowed with the ability to realize the social danger of its actions, control its behavior; therefore, it can be recognized as an offender (Radutnyi, 2017). We adhere to the opinion that AI technologies, as those that are very likely to be used, inter alia, to the detriment of society, can be defined in the criminal law sense as one of the ways to commit criminal offenses.

Therefore, in the future, offenses using AI technologies can be classified, for example, according to the sign of the offender: 1) actions committed by AI as an offender (in case it is recognized so); 2) unlawful actions of the user (intentional or careless) that led to any socially dangerous consequences; 3) unlawful actions of the developer of a separate AI technology (intentional or careless), which caused any socially dangerous consequences. Considering the possible risks, there is a need to determine the set of factors of social stipulation of the criminalization of actions with AI technologies in the criminal law of EU states and Ukraine.

Article 361¹ of the Criminal Code of Ukraine “Creation for unlawful use, distribution or sale of malicious software or technical means, and their distribution or sale” should be supplemented with part 3 as given below: “actions provided for in parts 1 and 2 of this article, if committed with artificial intelligence technologies”. For the needs of the banking sector, the above proposal of criminalization is important. It is the banking sector of the economy that is associated with attracting significant amounts of money, which affects the level of abuse, making it somewhat vulnerable.

Summarized information on the risks and benefits of AI application in Ukrainian banking is given in **Table 1**.

Table 1. Separate risks (disadvantages) and benefits of AI application in Ukrainian banking.

Risks (disadvantages) of AI application	Benefits of AI application
1) An increase of unemployment level due to the reduction of jobs replaced using digital technologies with elements of AI	The remote customer service provision, in particular in conditions complicated by the legal regime of martial law
2) Lack of “human factor” and individual approach to solving the “client-bank” problem	Demand for banking services among Ukrainians who are temporarily outside the country
3) The probability of disclosure of personal data of persons and the use of the data for illegal purposes	Reducing the costs of banking institutions for maintaining employees
4) Unregulated legal relations in the current legislation, which complicates the reliability of the legal assessment of certain situations involving AI	Detection of cyber threats and prevention of fraud in the field of banking
5) Impossibility of prosecuting AI in the event of socially dangerous consequences due to its misuse or misappropriation	Analysis of a significant volume of personal data, continuity of data collection

6. Conclusion

AI is able to perform effectively complex and simple routine tasks that require continuity to achieve high performance in a competitive environment. Digitization and development of remote bank customer service provide significant advantages for the banking operations in the setting complicated by martial law.

The implementation of certain digital technologies with elements of AI enabled to solve, to a certain extent, the problems of personnel transformations in the banking institutions in Ukraine. AI systems are already performing important tasks today and, in the perspective of Ukraine’s post-war recovery, they will function as a strategic auxiliary tool for the socio-economic rehabilitation of the state.

The banking system of Ukraine will need restoration as well. Banking institutions operating under the martial law ensure the interests of citizens, their comfortable access to all types of banking services and operations.

The acceptability of use of biometric identification technologies in the banking sector of the Ukrainian economy should be reviewed in the future and adapted to the unified provisions of EU Law on AI. The adoption of regulations on AI at the EU level will allow to outline the directions of development of national legislation and to develop the AI law as a branch of law in Ukraine. Under the conditions of the martial law, the introduction of a range of temporary measures to regulate AI to minimize the impact of any external threats is quite timely.

The post-war recovery of Ukrainian economy will require significant investment in the field of financial technologies and artificial intelligence, which can only be ensured if the relevant technologies function within the framework of the artificial intelligence law developed and adopted at the state level.

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