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The role of artificial intelligence in ensuring the efficiency and accessibility of justice

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Abstract: Information technologies are changing our world extremely fast. The availability of information technologies opens new opportunities but presents challenges. The above contributes to the relevance of applying artificial intelligence (AI) in the justice system. E-justice should facilitate digital market development, which is an essential e-government task. The legal industry has always been known for relying on tradition and resisting change. However, recent advances in AI technology are nimble to disrupt the legal landscape, changing how law firms and legal departments work. The article aims to clarify how to use AI to improve the efficiency and speed of judicial processes and analyze examples of successful implementation of AI systems in the legal field. The article determines the advantages and disadvantages of AI used in justice and examines the issue of accessibility and justice in the context of AI in justice. This research is relevant since it offers an in-depth understanding and analysis of new technologies in the context of legal challenges. It is possible to resort to this research when developing effective strategies for implementing artificial intelligence in the legal field, which constitutes its practical implication.

Keywords: Artificial intelligence. Electronic justice. Computer Technologies. Judiciary. International practice. National legislation.

Summary: Introduction – Materials and methods – Results – Discussion – Conclusions – References

Introduction

Qualitative changes that actively and rapidly affect almost every sphere of human activity are increasingly becoming characteristic features of today. The scientific and technical revolution (STR) is an ongoing process that, having begun in the Middle Ages with the appearance of the works of M. Copernicus and I. Newton, continues in our time thanks to fundamental shifts in scientific knowledge and technical and technological progress. In the middle of the 20th century information technology (IT) appeared and developed rapidly, and the first computer was created. Such technologies are inherently innovative. Thus, computer science achievements are the invention of powerful computer systems and the development of telecommunication networks, application software, and the most promising scientific direction – AI. The fields of application of AI systems are unlimited – from robots that make their decisions to machines with self-learning capabilities.

In 1950, the English mathematician Turing published the article "Computing Machines and Intelligence", noting that our interest in thinking machines arose due to a special kind of machine, usually called "an electronic or digital computer in a computer". He wondered how machines could think. The researcher noted that these machines were designed to perform any operations like a person. Since computing machines solve calculation problems of any complexity and are logically identical (there is no need to create a new machine for each new problem), they will be solved by only one computer, given the corresponding program is set.[1]

Modern IT affects all aspects of human life, and the field of justice is no exception. AI is an innovative technology that can affect the quality of the administration of justice, improve judicial processes, on the one hand, and contribute to the efficiency of the judge's work, on the other. If used in the judicial system, these tools and services increase the potential and quality of the judiciary, and therefore their research is an urgent scientific problem. Since there are few actual results on the AI application in the judicial system of Ukraine and related fields, the study of world practices can be useful and far-sighted.

The relevance of this phenomenon is best characterized by a quote from Google executive director Sundar Pichai: "Artificial intelligence is the new electricity. Very soon, neural networks will penetrate all spheres of life". One of the spheres of "penetration" of new technologies is the sphere of justice. This is not a question of the future but an already available reality. The judicial systems of some countries witness the introduction of the latest technologies and algorithms, which can quite easily and quickly process data and make the system fair, transparent, and

[1] A.M. Turing, 'Computing Machinery and Intelligence' (1950) 59(236) Mind. p.433-460.

efficient. At the same time, there is also a deviation from the "righteous path" since the machine can also detect prejudice.

AI is a set of sciences and methods capable of processing data to address complex computer problems. AI has human qualities and is capable of learning and solving problems. An important part of AI is therefore machine learning, or ML. The crucial condition for training AI in the field of justice is the data availability and unimpeded access to it. This makes it possible to analyze court practice more deeply and predict the outcome. The more data available, the more AI can refine models and improve predictive ability. AI imitates the work of the human brain using a system of neural networks built on the principle of organization and functioning of biological neuron cells — nerve cells of a living organism. However, an obvious shortcoming of AI is the lack of such a human quality as empathy, that is, empathy: while the judge may accept the arguments of the defendant, for example, in the case of late payment of alimony or debt repayment, the machine will not make any concessions.

Materials and methods

The methodological basis of the work is general scientific and special methods of scientific knowledge of facts and phenomena of legal reality. Thus, dialectical and idealistic methods served as the basis for revealing the role of AI in ensuring the efficiency and accessibility of justice. The terminological method made it possible to define the categories of the issues under study.

Special legal methods, such as formal-dogmatic and interpretation of legal norms, were used to examine international standards, norms of current domestic legislation, and practice of state authorities and courts. The statistical method helped to process empirical data and compare research results and statistics. The comparative legal method made it possible to highlight the positive experience of foreign countries in applying AI in judicial processes to improve its efficiency and speed.

Many scholars devoted their works to this issue, including Tsuvina, Varava, Cherpovytska, Zuryan, and Matviyev.[2] [3] [4] [5] [6] The article aims to clarify how to use AI

[2] T. A. Tsuvina, 'Online courts and online dispute resolution in the context of the international standard of access to justice: international experience' (2020) (149) Problems of Legality. p. 62-79.

[3] I. Varava, 'Innovations in the professional activity of lawyers: using the capabilities of artificial intelligence' (2020) 1(32) Information and Law. p. 47-54.

[4] I. Y. Cherpovytska, 'Modern foreign experience in the implementation of information and communication technologies as a means of optimizing communication between civil society and the judiciary' (2022) 56 Scientific Bulletin of the International Humanitarian University. p. 20-26. https://doi.org/10.32841/2307-1745.2022.56.5.

[5] V. Zuryan, 'Urgent problems and prospects for the development of electronic justice in Ukraine' (2020) (4) Bulletin of the Penitentiary Association of Ukraine. p. 173-181.

[6] R. I. Matviyev, 'The complexity of the integrity of judges in the context of the latest trends in legal reality' (2023) 13 Bulletin of LTEU. Legal Sciences. p. 24-28.

to improve the efficiency and speed of judicial processes and analyze examples of successful implementation of AI systems in the legal field. The article determines the advantages and disadvantages of AI used in justice and examines the issue of accessibility and justice in the context of AI in justice. This research is relevant since it offers an in-depth understanding and analysis of new technologies in the context of legal challenges. It is possible to resort to this research when developing effective strategies for implementing artificial intelligence in the legal field, which constitutes its practical implication.

Results

Humanity has been actively dealing with issues of artificial intelligence since the 1950s. The first definition of this concept was formed by John McCarthy in 1956 at a conference at Dartmouth University. AI is a set of sciences and methods capable of processing data to address complex computer tasks. From a theoretical point of view, AI imitates the work of the human brain with the help of a biological system of neural networks, which makes it possible to assist a person in solving numerous easy and difficult problems. However, the complete replacement of a person with AI is impossible now since it cannot imitate some emotional characteristics inherent in a human (for example, empathy). In addition, AI as an inorganic mechanism has many confirmed errors and malfunctions. The crucial condition for applying AI in the field of justice is the data availability and unimpeded access to it.

The issue of introducing artificial intelligence in justice remains debatable for every country in the world. The legislation does not allow replacing the judge with a software algorithm, but some legal practitioners discuss the appropriate involvement of artificial intelligence in this area. Thus, Article 6 of the European Convention on the Protection of Human Rights and Fundamental Freedoms enshrines the right to review cases by an independent and impartial court. However, Article 6 of this Convention does not explicitly prohibit the use of artificial intelligence nor specify that justice should be administered only by a human judge.[7]

The ethical prerequisite for AI use was the adoption of the European Ethical Charter on the use of Artificial Intelligence in judicial systems and their environment by the European Commission for the Efficiency of Justice of the Council of Europe in 2018.[8] The Charter provides principles that can guide politicians, legislators, and legal professionals as they face the rapid development of artificial intelligence

[7] Council of Europe, 'Convention on the Protection of Human Rights and Fundamental Freedoms' available at https://zakon.rada.gov.ua/laws/show/995_004#Text (last visited on September 15, 2023).

[8] Council of Europe, 'European ethical Charter on the use of Artificial Intelligence in judicial systems and their environment' https://rm.coe.int/ethical-charter-en-for-publication-4-december-2018/16808f699c (last visited on October 27, 2023).

in national judicial processes. The Charter states that AI use in the field of justice can increase its efficiency and quality and must be implemented in a responsible manner that complies with the fundamental rights guaranteed, in particular, by the European Convention on Human Rights and the Council of Europe Convention on the Protection of Personal Data. The Charter defines the main principles that should be followed in the field of artificial intelligence and justice:

– the principle of respect for fundamental rights: ensuring the compatibility of the development and implementation of artificial intelligence tools and services with fundamental rights;

– the principle of non-discrimination: the special prevention of the development or strengthening of any discrimination between individuals or groups of individuals;

– the principle of quality and security: regarding the processing of judicial decisions and data, using certified sources and intangible data with models developed in an interdisciplinary manner and in a secure technological environment;

– the principle of transparency, impartiality, and fairness: make data processing methods accessible and understandable, allow external audit;

– user-controlled principle: excludes a prescriptive approach and ensures that users are informed participants and in control of their choices.

The use of AI tools and services in judicial proceedings is a problem that requires further theoretical development, considering the continuous IT development, as well as technological innovations in judicial systems caused by such qualitative changes. Judiciary adapts to new conditions as objectively new tasks appear, and, therefore, the need to solve them.[9]

In its Conclusion No. 14, the Advisory Council of European Judges (CEPEJ) defines IT as an instrument for improving the administration of justice. It is believed to facilitate access to justice, advance court proceedings, and speed up court activity. CEPEJ holds IT is central in providing information to judges, lawyers, and other stakeholders in the justice system, the public, and the media. At the same time, IT should meet the needs of judges and other system users, which, in any case, should not violate guarantees and procedural rights, the principle of impartiality in the consideration of a case.

Judges should be involved in all decisions regarding the use and development of IT in the judiciary. The CEPEJ warns it is necessary to account for the needs of those who cannot use IT tools. Judges should be empowered to insist on the personal presence of interested parties, the provision of printed documents, and oral hearings. Furthermore, IT cannot replace the judge's authority to examine and evaluate evidence.

[9] G. Said, K. Azamat, S. Ravshan, A. Bokhadir, 'Adapting Legal Systems to the Development of Artificial Intelligence: Solving the Global Problem of AI in Judicial Processes' (2023) 1(4) International Journal of Cyber Law. https://doi.org/10.59022/ijcl.49.

The CEPEJ encourages the use of IT to strengthen the role of the judiciary in upholding the rule of law in democratic states but cautions that IT should not interfere with the powers of the judge and undermine the guiding principles of the judicial process by Article 6 of the European Convention on Human Rights (ECHR). The CEPEJ recognizes that the role of AI in society is increasing. Moreover, the CEPEJ hopes for a positive effect of the widespread adoption of AI for societies in general and judicial systems in particular. Therefore, within the scope of its mandate, CEPEJ has officially proclaimed five fundamental principles, reflected in the Charter.

The Charter is designed for public and private entities empowered to create and implement AI tools and services involving judicial decision-making and data (machine learning or any methods derived from data science). It should also guide the activities of public authorities in the legislative regulation, development, control, or use of such tools and services. The Charter defines AI as a set of scientific methods, theories, and technologies for reproducing human cognitive abilities with the help of a machine.[10]

Modern developers are looking for machines capable of solving complex tasks that used to be solved by people. However, the term *artificial intelligence* is criticized by experts who distinguish between "strong" (capable of solving specialized and diverse problems completely autonomously) and "weak" or "moderate" AI (high performance in the field of learning). Some experts argue that "strong" AI will require significant advances in basic research, not just simple improvements in the efficiency of existing systems capable of modeling the world. The tools defined in the Charter were developed using machine learning methods, i.e., based on "weak" AI.

CEPEJ emphasizes that a state should encourage the use of AI but within the limits of responsibility. State regulation of this area needs to be guided by and consider the fundamental human rights proclaimed by the ECHR, the Convention for the Protection of Individuals about Automatic Processing of Personal Data, and the principles of the Charter.[11]

According to the developers, court decisions in civil, commercial, and administrative cases processed by AI will help increase the likelihood of predicting the applicable law and its content. As for criminal cases, it is essential to account for numerous caveats when using AI to prevent discrimination based on confidential data by the right to a fair trial. Regardless of where exactly AI is used (providing legal

[10] A. Olas, Looking beyond Covid-19 pandemic: does Artificial Intelligence have a role to play in preparing the justice system for the next global pandemic or similar hardship? The European perspective. Brill, 2023. 276 pages.

[11] Council of Europe, 'Convention for the protection of individuals with regard to automatic processing of personal data'. https://rm.coe.int/1680078b37 (last visited on October 4, 2023).

advice, developing or making court decisions, advising a direct user), the processing should also rely on an external and independent expert program evaluation, which is transparent, impartial, fair, and certified. The principles of effective use of AI in judicial proceedings proclaimed in the Charter are essential for the proper functioning of the system, and its purpose cannot be realized without them.

The first principle of the Charter is the principle of respect for fundamental rights. There must be a guarantee that AI tools and services comply with human rights and fundamental freedoms (primarily those proclaimed by the ECHR and the Convention for the Protection of Personal Data). The ECHR and the GDPR should guarantee that the processing of court decisions and data has clear objectives compatible with rights and freedoms. When using AI tools in cases of legal dispute, assistance in making a court decision, or providing guidance to the public, it is necessary to ensure that the guarantees of the right to access justice and the right to a fair trial (equality of rights and respect for the adversarial process) are observed or not violated. In addition, the principles of the rule of law and judicial independence in the decision-making process must be duly respected.[12]

Therefore, preference should be given to the following types of software development: either "ethical by design" (the program developers make ethical choices by inertia and thus do not leave a choice to the user) or "human rights-oriented". Consequently, rules prohibiting direct or indirect violations of fundamental rights protected by conventions are integrated at certain stages of program design and training.[13]

The second principle is the principle of non-discrimination, which implies the creation of efficient safeguards against the development or intensification of any discrimination between individuals or groups of individuals. AI can identify existing discrimination by aggregating systematized data about individuals or groups of individuals, so public and private decision-makers should ensure that AI tools do not reproduce or reinforce such discrimination and do not lead to deterministic analyses or use. Particular attention should be paid to both the development and deployment phases, especially when processing is directly or indirectly based on sensitive data, including race and ethnicity, socioeconomic status, political opinions, religious or philosophical beliefs, trade union membership, genetic or biometric data, and data related to health or sexual life and orientation. If such discrimination exists, authorized persons should take corrective measures to limit or neutralize

[12] S. M. Smokov, V. V. Horoshko, M. V. Korniienko, S.V. Medvedenko, 'Rule of Law as a Principle of Criminal Procedure (on materials of the European Court of Human Rights)' (2022) 14(3) Pakistan Journal of Criminology. p. 37-46.

[13] D. Mhlanga, 'The role of artificial intelligence and machine learning amid the COVID-19 pandemic: What lessons are we learning on 4IR and the sustainable development goals' (2022) 19(3) International Journal of Environmental Research and Public Health. p. 1879.

these risks. However, the use of machine learning and multidisciplinary scientific analysis should be encouraged to overcome it.

The third principle is the principle of quality and security, which implies respect for the processing of judgments and data and the need to use certified sources and intangible data with models developed in an interdisciplinary manner in a secure technological environment. The developers of machine learning models should work closely with experts in the relevant field of the justice system (judges, prosecutors, lawyers, etc.) and researchers in the fields of law and social sciences (e.g., economists, sociologists, and philosophers). Thus, the formation of a mixed project team in short cycles of creating functional models is one of the organizational methods that allows for an interdisciplinary approach. Existing ethical safeguards should be continuously disseminated among project teams and reinforced through feedback.

The judgment-based data in the software that implements the machine learning algorithm should come from certified sources and not be altered while the learning engine uses it. In addition, the created models and algorithms must also be stored and used in a secure environment to ensure system integrity.

The fourth principle is the principle of openness (transparency), impartiality, and honesty, which implies accessible and understandable ways of processing data and using external audits. The CEPEJ believes that it is crucial to strike a balance between intellectual property rights to certain processing methods and the need for transparency (access to the design process), impartiality (absence of bias), fairness, and intellectual integrity (priority of the interests of justice) when using tools that may have legal consequences or a significant impact on people's lives. It should be made clear that these measures apply to the design and operation of chains, as the selection process and the quality and organization of data directly affect the learning phase.

The first option includes full technical transparency (e.g., open-source code and documentation), which is sometimes limited by the protection of commercial information. The system can also provide additional explanations through communication to describe the procedure for obtaining results. This communication should cover the nature of the services provided, the tools developed, and the presentation and risks of errors. Independent bodies and experts should be empowered with certifying and verifying processing methods or providing preliminary advice. Public authorities should conduct certification, subject to regular review.[14]

[14] T. Sourdin, B. Li, D. M. McNamara, 'Court innovations and access to justice in times of crisis' (2020) 9(4) Health Policy and Technology. p. 447-453.

The fifth principle, the "user-controlled" principle, emphasizes the exclusion of a prescriptive approach and the existence of a guarantee of awareness of the user subject, who controls their choice (decision). The user's autonomy should be increased and not limited to AI tools and services. The user should be able to review court decisions and data used by him/her at any time and not continue to be bound to these decisions and data, taking into account the specific features of a particular court case.

Users should be informed in clear and understandable language about the binding or non-binding nature of the decision proposed by the AI tool concerning the various options available, as well as about their right to legal advice and the right to access the court. It is mandatory to inform users about their rights to object AI pre-processing of the case before or during the trial; they can demand that a court examine the case in the context of Article 6 of the ECHR. In other words, when implementing any AI-based information system, a computer literacy program should be developed for its users, and a discussion with the participation of justice system professionals should be proposed.

CEPEJ insists that the principles proclaimed by the Charter be applied throughout the judicial systems and their implementation be monitored and evaluated by public and private actors to improve practices continuously.

The USA has become the main AI user in the justice system, particularly in civil and criminal cases. Researchers from Stanford University have developed an algorithm that acts as a judge's assistant when choosing a preventive measure for a defendant. This program allows for a fair assessment of risks and the detention of a much smaller number of people while maintaining a balance of public safety. The product of the commercial company Northpointe is the Correctional Offender Management Profiling for Alternative Sanctions (COMPAS) software, which assesses the risk of reoffending by a person who is to be sentenced. The COMPAS program is based on the processing of data obtained by answering questionnaires by defendants. If defendants refuse to answer questionnaires, the program relies on information from their files. The data are divided into dynamic ones subject to change (drug addiction, professional status, or inclination to join a criminal group) and static ones that cannot change (gender, age, criminal status, and criminal history). As a rule, the judge passes a sentence based on the risk assessment of the program's findings.

However, it is worth noting that the use of the COMPAS program violates ethical standards, which is confirmed by the findings of research by the American non-governmental organization ProPublica. A striking example of such violations is the case of State v. Lomis, which was heard by the Wisconsin Supreme Court in 2016. According to the case file, Lomis was sentenced by the circuit court using

the COMPAS risk assessment, and the appellate court affirmed the specific issue of whether the use of the COMPAS risk assessment in sentencing violated the defendant's right to due process, either because the proprietary nature of COMPAS prevents defendants from challenging the scientific validity of the COMPAS score or because COMPAS scores take into account the sex of the individual. Lomis argued in his complaint that the court's consideration of the COMPAS risk assessment at sentencing violated the defendant's right to due process. This led to the court's erroneous use of its discretion to assume that the factual basis for the charges had been repeated (existing COMPAS risks). As a result, Lomis lost the case.[15]

Paul Zilli, an African American, was convicted of stealing a lawnmower and some tools in 2013. Paul's lawyer negotiated a plea deal with the prosecutor, under which Paul pleaded guilty and was sentenced to one year in prison and another year of administrative supervision. The COMPAS program assessed Paul as a high risk of committing further crimes, and it was after this that the judge changed his mind, canceling the plea agreement and sentencing Paul to two years in state prison and three years of administrative supervision.

The above examples emphasize that AI-based programs reveal the result of judicial analysis rather than its entire process. Thus, neither the defendant, the judge nor the public can see the decision-making process behind the sentencing prediction (although any sentence must be reasonable). It is unclear what criteria the developers of the COMPAS program used to determine the algorithm of work and establish risk assessments. Therefore, this issue is classified as an intellectual secret.

The uniqueness of modern data processing is that it does not try to reproduce the human model of cognition but creates contextual statistics based on data without any guarantee of false autocorrelations. Moreover, there is a real risk that the algorithm may provide discriminatory conclusions. An example is the COMPAS software (since 2017, the company has been called Equivalent). This program assesses the risk of reoffending by a person in respect of whom a judge is to pass a sentence. It is the most widely used program in the US criminal justice system.

COMPAS is based on data obtained from 137 questionnaires answered by the defendant, or in case of refusal, the information is taken from the defendant's file. The data are divided into dynamic data that are variable and can change – drug addiction, environment, professional status, and statistical data that cannot change and are more determinative for forming a conclusion – age, gender, criminal history, and offender status at the time of the first offense. During the survey, individuals are asked the following questions:

[15] I. Dankwa-Mullan, E. L. Scheufele, M. E. Matheny, Y. Quintana, W. W. Chapman, G. Jackson, B. R. South, 'A proposed framework on integrating health equity and racial justice into the artificial intelligence development lifecycle' (2021) 32(3) Journal of Health Care for the Poor and Underserved. p. 300-317.

1. How often did you get into fights when you were at school?
2. How many of your friends/acquaintances have ever been arrested?
3. How old were you when your parents divorced, if any?
4. Does a hungry person have the right to steal?

During the calculation, the defendants are divided into risk groups ranging from 1 to 10 (1 to 4 – low risk; 5-7 – medium risk; 8-10 – high risk). The judge then passes a sentence based on this risk assessment.[16]

The American non-governmental organization ProPublica revealed a violation of ethical standards by the algorithms used in the COMPAS program, namely racial bias. The algorithm was twice as likely to label African American defendants as repeat offenders, while white defendants were identified as low-risk. The assessment proved to be unreliable in predicting, as only 20% of African Americans out of the expected 40% reoffended.[17]

Two African Americans, Brisha Borden and Sade Jones, tried to steal a children's bike and scooter in 2014. Prior to this, Borden had committed minor offenses. Vernon Prather, a 41-year-old white man, was arrested for stealing tools worth $86.35 in 2015. Prater was a more experienced criminal; he had already been convicted of robbery and attempted robbery, for which he served five years in prison. The program showed that Brisha Borden was at high risk of reoffending even though she had no new charges for two years. Prater was assessed as low risk at the time and later received an eight-year sentence for stealing electrical appliances worth thousands of dollars.[18]

The story of Paul Zilli, an African American, demonstrates that judges change their minds after seeing AI reports. In 2013, a man from Wisconsin was convicted of stealing a lawnmower and some tools. His lawyer negotiated a deal with the prosecutor. Paul pleaded guilty, for which he was supposed to spend one year in prison and further administrative supervision. Northpointe assessed Zilli as a high risk for further crimes, and it was after this that Judge James Babler changed his decision, reversing the plea and sentencing Zilli to two years in state prison and three years of supervision.

There should be a solid ground to justify any decision. AI-based programs, such as SOMPAS, show results but do not disclose the entire analysis process. Therefore, neither the defendant, the public, nor even the judge can see what

[16] D. Golovin, Y. Nazymko, O. Koropatov, M. Korniienko, 'Electronic evidence in proving crimes of drugs and psychotropic substances turnover' (2022) 5(2) Access to Justice in Eastern Europe. p. 156-166. https://doi.org/10.33327/AJEE-18-5.2-n000217.

[17] R. Vinuesa, H. Azizpour, I. Leite, M. Balaam, V. Dignum, S. Domisch, A. Felländer, S.D. Langhans, M. Tegmark, F. Fuso Nerini, 'The role of artificial intelligence in achieving the Sustainable Development Goals' (2020) 11(1) Nature Communications. p. 1-10.

[18] O. Kovalova, M. Korniienko, O. Postol, 'Ensuring of child's dignity as a principle of modern education: administrative and legal aspects' (2019) 21(2) Asia Life Sciences Supplement. p. 341-359.

decision-making process this prediction is based on. This secrecy exists, on the one hand, because of the existing patent rights of the developers of these programs, which have a risk of plagiarism, and on the other hand, because of the Black Box problem, in which the patent holders are not able to fully understand the decision-making mechanisms. Northpointe refused to explain how the algorithm calculated the risk score, as this information is confidential. Unfortunately, in this whole story, there was no reasonable balance between ensuring the patent rights of developers and the fundamental rights of persons who were once defendants and whose information was processed by the COMPAS algorithm.

The US judicial systems willingly use the advantages of electronic systems. The first ideas to use digital technologies in solving legal problems emerged in the United States as early as the 2000s. Rocket Lawyer and Legal Zoom have developed and implemented legal tech that provide education services for mobile documents, smart contracts, and legal advice. Legal tech is used to provide many support services (appealing against decisions on administrative offenses issued using automated control). These electronic systems can estimate the positive or negative chance of a particular court case being resolved based on the data provided in an online questionnaire and, on this basis, offer a range of services to represent interests in court for a percentage of the amount received if the case is won.[19]

Another intellectual development has the main function of predicting the final decision of the US Supreme Court. The program can analyze the entire list of Supreme Court decisions since 1952 and their interpretations. The creators have developed an algorithm in which data on the resolved case is entered into the information base according to two parameters, which allows predicting 69.7% of the decisions of the highest judicial body of the United States, as well as accurately forecasting 70.9% of the results of the votes of the supreme judges in a given year.

Another system developed by American researchers is the DARE program, which recognizes false testimony in court. In order to have a chance to use the DARE program efficiently, AI was trained using video footage from 121 trials. The system tracks visual changes in facial expressions, voice, and speech. DARE's performance in recognizing deception was 92%. In this case, there is a clear interaction between information technology and psychology, which can often help solve a crime. However, these studies cannot consider all possible reactions of the human psyche. The above and similar systems should be used with a high degree of control. The main role of such programs should be to assist the user in making a particular decision and choosing the most effective strategy of action within a particular trial.

[19] R. M. Re, A. Solow-Niederman, 'Developing artificially intelligent justice' (2019) 22 Stanford Technology Law Review. p. 242-289.

AI can structure information. In complex court cases, it can be useful to recognize patterns in text documents and case files. For example, electronic discovery (eDiscovery) exists in the United States. eDiscovery allows identifying, collecting, and providing information stored on digital media. eDiscovery uses a learning method in AI technology to invent the best algorithm for finding relevant sections in a large amount of information. The parties to the case agree on the search terms and coding to be used. The judge determines the evidence. This process is much faster and more accurate than a human search. The courts of the United States and the United Kingdom recognize this methodology of document research.

China, a direct competitor in the technology arena, can compete with the United States for the title of leader in the use of technology. Since 2017, an online court has been operating there in the form of a mobile application of the main Chinese program WeChat. A video chat replaces a traditional courtroom, and an avatar controlled by AI instead of a judge. The first digital court was the Hangzhou court, and then the Chinese government created similar courts in Beijing and Guangzhou. In total, the courts have reviewed about 119,000 cases and issued decisions on 88,000 cases. The court is empowered to consider copyright disputes, online business disputes, and e-commerce violations.[20]

In European justice systems, the use of AI algorithms remains predominantly a private sector initiative, and the state does not properly perceive it. Moreover, certain issues of AI applications are subject to criminal prosecution. For example, France has criminalized the analysis of case law, which makes it possible to predict what decision a particular judge might make in a case. Such liability was adopted under pressure from the judiciary, arguing that court decisions are used to analyze the behavior of a particular judge, which violates their rights.

In the UK, in 2013, the Government presented a program to reform the criminal justice system called Swift and Sure Justice. Researchers have concluded that in the case of remote participation in a court hearing via teleconference, including cross-examination, victims of sexual crimes recall traumatic events better, as they avoid the psychological trauma caused by a personal meeting with the suspect.

The first “virtual court” was held in the Birmingham Magistrates’ Court. Currently, UK courts are actively modernizing their equipment and implementing special software. In addition, the UK uses a digital system in which AI can predict the decisions of the European Court of Human Rights (ECtHR). The principles of its operation are based on the analysis of 584 judgments issued by the Strasbourg Court on complaints of torture, humiliation of personal dignity of a person and

[20] C. Chen, Y. Hu, M. Karuppiah, P.M. Kumar, ‘Artificial intelligence on economic evaluation of energy efficiency and renewable energy technologies’ (2021) 47 Sustainable Energy Technologies and Assessments. p. 101-358.

citizen/subject, events related to the restriction of fundamental rights and freedoms, etc. Machine learning technologies allow for determining the outcome of court cases in 79% of cases.[21]

AI can be useful for different types of court cases in legal proceedings. Thus, the statistics of court cases in the Netherlands showed that out of 1.5 million cases per year, a large share is so-called routine cases – cases with a predictable outcome in which a decision is made based on the information provided. This is typical, to a greater extent, for family and labor cases. In such cases, the court considers the mechanism for resolving a legal conflict proposed by the parties to the conflict from the point of view of its legality and is similar to a notary. Such cases include divorce by mutual consent, establishment of parental custody, termination of employment, etc. Thus, a court decision in such cases is a document that is largely produced automatically, confirming that the agreement complies with the law. In more complex cases, where there is a dispute about the law, especially in criminal cases, the needs for IT in general, and AI, in particular, are different. Consequently, AI can play different roles in different types of cases (types of processes) in courts.

AI can consult and provide useful advice to people looking for solutions to their legal problems and lawyers. In this case, AI provides relevant information and answers questions to the user. The user is free to take the advice or not. This ability of AI becomes an opportunity for an individual to prevent a future legal dispute. AI support in the entire process of a court ruling or its part can eliminate monotonous actions. The first proven example of online dispute resolution is Solution Explorer used in the Civil Court (CRT) in British Columbia, Canada. Solution Explorer is a front-end of the CRT that uses Q&A to provide personalized legal information in plain language and free self-help tools to resolve disputes without the need to file a lawsuit. It applies a basic form of AI – an expert system that makes specialized legal knowledge widely available to the public.[22]

The Estonian Ministry of Justice has asked IT specialists to create a robot judge that will resolve disputes on small claims up to EUR 7,000. This robot judge is designed to reduce the burden on the state apparatus. The project is still under development but expected to start with consideration of cases over conflicts with contracts. Both parties are expected to upload all the necessary documents and other relevant information, and the program will make a decision that can later be appealed in court. The developer assures that the system will be adjusted after receiving feedback from lawyers and judges.

[21] A. Nguyen, H. N. Ngo, Y. Hong, B. Dang, B.P.T. Nguyen, 'Ethical principles for artificial intelligence in education' (2023) 28(4) Education and Information Technologies. p. 4221-4241.

[22] G. Currie, K. E. Hawk, 'Ethical and legal challenges of artificial intelligence in nuclear medicine' (2021) 51 Seminars in Nuclear Medicine. p. 120-125.

As for replacing judges with robots, it is impossible shortly. After all, many years will pass before AI meets the right to a fair trial, the standard outlined in Article 6 of the ECHR. For now, it can assist in searching and structuring information, advice, or suggestions for legal inquiries, provided it is constantly updated.[23]

In Ukraine, the implementation of AI in justice remains a problematic issue. The first step towards this is the launch of an electronic court, which has not found an effective implementation way yet. This electronic court can reduce the time for data processing and analysis of case law.

According to the Concept for the Development of Artificial Intelligence in Ukraine, approved by Order of the Cabinet of Ministers of Ukraine No. 1556-p,[24] artificial intelligence is an organized set of information technologies used to perform complex tasks by using a system of scientific research methods and algorithms for processing information received or independently created during work, as well as to create and use its knowledge bases, decision-making models, algorithms for working with information.

A wide range of scientific problems lies in the area of digitalization of the legal system in Ukraine. In the context of reforming domestic legislation, the digitalization of the codes on liability for public offenses (the Criminal Code, the Code of Administrative Offenses) is only part of the national digitalization program for the legal system. At the same time, the purpose of the digitalization of codes is to help law enforcement agencies (detectives, investigators, prosecutors, judges, defense attorneys, probation officers, prison and enforcement officers, etc.) make decisions when solving a particular problem using AI. A prerequisite for this is to build codes on a single methodological basis, which includes the following: a single structure (e.g., books, sections, subsections, articles, paragraphs, or subparagraphs), terminology, typification (classification) of offenses, and their legal consequences, unification of various registers, other materials, etc.[25] [26]

A prerequisite for the introduction of AI in Ukraine is the launch of the Unified Judicial Information and Telecommunication System (UJITS). The system envisages a paperless workflow owing to electronic digital signatures and document management. It also involves creating personal accounts for procedural actions and improving the

[23] F. Olan, E. O. Arakpogun, J. Suklan, F. Nakpodia, N. Damij, U. Jayawickrama, 'Artificial intelligence and knowledge sharing: Contributing factors to organizational performance' (2022) 145 Journal of Business Research. p. 605-615.

[24] Cabinet of Ministers of Ukraine, 'About the approval of the Concept of the development of artificial intelligence in Ukraine'. https://zakon.rada.gov.ua/laws/show/1556-2020-p#Text (last visited on October 4, 2023).

[25] T. A. Tsuvina, 'Online courts and online dispute resolution in the context of the international standard of access to justice: international experience' (2020) (149) Problems of Legality. p. 62-79.

[26] M. V. Korniienko, I. V. Petrunenko, I. V. Yena, K. O. Pankratova, K. A. Vozniakovska, 'Negative effects of corruption offenses for the country's economy' (2020) 11(5) International Journal of Management. p. 1072-1083. https://doi.org/10.34218/IJM.11.5.2020.098.

Unified State Register of Court Decisions by adding a system of hyperlinks to the legal positions of the Supreme Court. This will enable the algorithm to select the relevant Supreme Court decision for a particular case and construct a draft decision without human intervention. Today, the Electronic Court subsystem is operating in test mode, allowing you to file an exhaustive list of claims, track the progress of the case, submit procedural documents, pay court fees, and monitor the receipt of claims against you, all of which are done online.[27]

However, the complete implementation of UJITS will take several years. Only a few courts have implemented certain modules, and electronic lawsuits must be duplicated in hard copy. Due to several issues, the government has implemented an active policy of digital transformation. This will lead to rapid development in this area and result in more efficient and transparent work of Ukrainian courts. With the change of government in 2019, digitalization became one of the priorities of state policy, and the goal was to create a "state in a smartphone". Naturally, the newly created Ministry of Digital Transformation was supposed to become one of the locomotives of this trend in Ukraine. Among its tasks was a fairly new issue for Ukraine, but not for the world, to ensure AI development.

The Ministry of Digital Transformation has developed and published the Draft Order of the Cabinet of Ministers of Ukraine "On Approval of the Concept of Artificial Intelligence Development in Ukraine" for public discussion. This strategic document is intended to actualize the issue of artificial intelligence and its development as one of the drivers of Ukraine's social and economic development until 2030. The concept tries to build on and reflect the main principles of the Organization for Economic Cooperation and Development (OECD) Guidelines on Artificial Intelligence, which Ukraine joined in 2019.[28]

The main principles of the development and use of AI technologies include the following:

– AI should benefit people and the planet, contributing to inclusive growth, sustainable development, and prosperity;

– AI systems shall be developed and used only in compliance with the rule of law, and their use shall be ensured by appropriate guarantees, in particular, the possibility of unimpeded human intervention in the system's operation;

– ensuring transparency and responsible disclosure of information about AI systems;

[27] O. Yu. Drozd, L. V. Soroka, 'Digitization of courts: European experience' (2023) 1 Scientific notes of Taurida National V.I. Vernadsky University. p. 77-81.

[28] I. Varava, 'Innovations in the professional activity of lawyers: using the capabilities of artificial intelligence' (2020) 1(32) Information and Law. p. 47-54.

– organizations and individuals that develop, implement, or use AI systems are responsible for their proper functioning by the above principles.

The draft Concept defines the following core areas of state policy in the field of AI: education and human capital, science and innovation, economy and business, cybersecurity, defense, public administration, legal regulation and ethics, and justice. The drafters of the Concept also consider the trend toward electronic justice, whose implementation in Ukraine has been subject to numerous struggles in recent years. The Ministry of Digital Transformation envisages that one of the areas of use of artificial intelligence should be the issuance of court decisions in cases of minor complexity (by mutual agreement of the parties) based on the analysis of current legislation and court practice performed by artificial intelligence.[29]

Although such innovation may reduce the workload of Ukrainian courts, it is important to consider the potential threats. The judicial system's problems with delivering just decisions may lead to heterogeneity of practice. Additionally, there are issues with the timely filling of the Unified Register of Court Decisions and determining which cases will be classified as minor.

Discussion

The first positive aspect of using Artificial Intelligence (AI) in justice is the objectivity of the case with the exclusion of some human factors. Jerome Frank noted that justice is "what the judge ate for breakfast". In the article "Extraneous Factors in Court Decisions", the authors analyze court decisions and provide evidence that "the probability of a favorable decision for the defendant is greater at the very beginning of the day or after a break than later in the sequence of cases". Another positive aspect is the speed of case processing. In 2019, the Beijing Internet Court announced the launch of an online courtroom center that uses AI as a judge with a female image, voice, facial expressions, and movements.

The Beijing Internet Court notes that the use of this technical breakthrough will help judges concentrate on their work, while the AI judge will help with routine work. Other AI programs in China help to make court proceedings faster. For example, the mobile mini-court, the number of users of which reached more than 3 million in 2020, and courts across the country used this application to consider more than 2.14 million cases. Since Chinese courts are overwhelmed with millions

[29] I. Y. Cherpovytska, 'Modern foreign experience in the implementation of information and communication technologies as a means of optimizing communication between civil society and the judiciary' (2022) 56 Scientific Bulletin of the International Humanitarian University. p. 20-26. https://doi.org/10.32841/2307-1745.2022.56.5.

of cases, and domestic legal reforms have led to a sharp increase in the workload, it is quite beneficial to use AI in justice.[30]

Even though the AI system has several positive features that are already part of justice in several countries, there are threats in terms of violating fundamental human rights. An example of this problem is the Correctional Offender Management Profiling for Alternative Sanctions (COMPAS) program, which processes completed offender profiles and provides information on the risk of recidivism. The investigation published by ProPublica proved that several inalienable human rights were violated. The authors of the publication concluded that "the COMPAS system unevenly predicts recidivism between the sexes". However, the most dangerous consequence of using this program was the identification of signs of racial discrimination. The researchers compared the assessment statistics for African Americans and white people and proved that "African American defendants received a 77.3% higher violent recidivism score".

Another negative feature of AI integration is the lack of empathy in computer technology. A court should be independent and objective, but the human factor sometimes plays an important role in a fair judgment. The significance of a human judge is exemplified by Judge Frank Caprio's decision. The offender was a 96-year-old man who was speeding in a school zone while driving his 63-year-old son, who had cancer, to the hospital. After considering the case, the judge released the man from the penalty of a fine.[31]

Thus, on the one hand, AI enables countries to review cases faster and better and provides a more impartial decision-making environment. On the other hand, computer technology poses threats to human rights, for which society has fought so hard. Widening discrimination and violating the principle of innocence are already real negative consequences.

The issue of integrating AI into justice has not escaped Ukraine, which has embarked on the path of its development and standardization by European norms and requirements. One of the main tasks is to improve the judicial system, as this branch of power is discredited in the eyes of Ukrainian society. As for the disadvantages of introducing AI into Ukrainian justice, it is a threat to the development and improvement of national laws. When there is a problem that the relevant law cannot fully protect the victim, the higher courts begin to explain the provisions of the written rule, which in turn allows for judicial lawmaking and strengthening of national legislation. An example of the importance of judicial interpretation is the

[30] Y. Rydkoborod, A. Melash, 'The role of artificial intelligence in criminal proceedings' (2023) 5(35) Scientific Perspectives. p. 690-700.

[31] Zh. Udovenko, N. Rudenko, 'Advantages and disadvantages of the implementation of the artificial intelligence system in the justice system of Ukraine' (2023) 4(10) Current Issues in Modern Science. p. 252-262.

problem of application and prosecution under Article 126-1 of the Criminal Code of Ukraine on domestic violence.[32] The main reason for the ineffectiveness of this provision is the sign of systematicity. Judges of different instances tried to analyze the article from a practical perspective, but everyone had a different vision of the definition of systematic nature. Some decisions stated that it was "from two or more crimes", but the Supreme Court found that systematic violence is considered from the moment of violence for the third time.[33]

In this context, it is worth noting that the task of judges is not only to establish justice and protect the rights of victims but also to be the process that simultaneously writes and explains the law. AI, in turn, makes decisions based on existing practice, which means that machine learning algorithms can perpetuate existing discrimination or reproduce past mistakes.

The next problem is the uncertainty of AI's legal personality and its responsibility for its decisions. On the one hand, AI cannot be held criminally liable because it does not have such a component as guilt, and the responsibility for the actions of software agents rests with commercial corporations, manufacturers, or users. On the other hand, AI can already be considered a subject of criminal liability. AI, physically embodied in a robotics object, should be considered a subject of legal relations somewhere between legal entities and individuals; therefore, AI has every reason to bear responsibility under the Criminal Code of Ukraine.

At the same time, the benefits of using AI in the justice system are undeniable. The main achievement of AI applications is the unloading of courts and reduction of the workload for each representative of the Themis. The staff shortage is not a problem but a catastrophe. The staff shortage in the judicial system in Ukraine is more than two thousand judges, causing an increased workload and, in turn, a failure to consider a case within a reasonable time.[34]

Ukraine has every opportunity to develop computer technologies that can benefit the country. Today, some programs have a set of AI characteristics that help lawyers and judges before and during the trial. An example is Verdictum Ligazakon, which can analyze a procedural document and predict the potential resolution of a dispute based on the statement of claim and previous case law.

AI has no stereotypes that can influence people's decisions. This helps to provide more objective decisions that will not depend on personal beliefs and

[32] Verkhovna Rada of Ukraine, 'Criminal codex of Ukraine'. https://zakon.rada.gov.ua/laws/show/2341-14#Text (last visited on November 26, 2023).

[33] V. Zuryan, 'Urgent problems and prospects for the development of electronic justice in Ukraine' (2020) (4) Bulletin of the Penitentiary Association of Ukraine. p. 173-181.

[34] R. I. Matviyev, 'The complexity of the integrity of judges in the context of the latest trends in legal reality' (2023) 13 Bulletin of LTEU. Legal Sciences. p. 24-28.

stereotypes. AI helps to reduce the time and effort required to prepare cases and ensure access to justice. This allows for more time to be spent on the case.[35]

The result is an improvement in the level of judicial services provided to the public and increased trust in the work of the court. At the same time, the analysis of foreign experience provides a practical understanding of potential threats to the digitalization of the judiciary. AI may be seen as a neutral tool, but in reality, it may contain a certain level of hidden subjectivity. For example, AI algorithms may be dependent on prior information and data and may contain hidden discrimination.

AI may be limited in its ability to understand the context and reproduce human behavior in complex situations. This can lead to a lack of flexibility and insufficient ability to adapt to new situations. The risk of data leakage: The use of AI in criminal proceedings and justice requires a large amount of sensitive information. This can lead to the risk of data leakage and misuse. Lack of ethical standards: In the absence of ethical standards governing the use of AI in criminal proceedings and justice, ethical issues may arise, such as insufficient privacy protection and the possibility of using AI for control.

Violations of human rights, inhibition of the judicial lawmaking process, and uncertainty about the legal personality of AI hinder the process of rapid integration of AI into the judiciary. However, we believe that the gradual integration of AI into Ukrainian justice and its development as an auxiliary tool is an important task that will help restart the Ukrainian judiciary, bring it closer to European standards, and increase the level of respect for courts and representatives of the Themis.

Conclusions

Since the mid-1990s, there have been discussions about replacing judges with robots. Indeed, robots and computers are increasingly taking over the physical and mental labor of humans. Global practices have proven the usefulness of Information Technology (IT) for justice, especially when it comes to processing large amounts of information and making complex decisions, and there are certain achievements and failures in the use of AI in judicial systems and related industries in different countries. The experience of using innovative technologies in these areas in technologically advanced countries needs to be studied, and it may be useful in developing specific actions to reform the Ukrainian judicial system.

[35] O. Oliynychuk, R. Oliynychuk, A. Kolesnikov, 'Electronic justice as an element of the modern judicial system' (2022) (3) Actual Problems of Jurisprudence. p. 141-147.

The future of justice certainly lies in technology and the automation of judicial processes. AI has a huge potential to speed up the data processing process, relieve the work of courts, and make it more efficient. However, it is very important to adhere to fundamental principles when using AI.

For the global community, the issue of introducing artificial intelligence in justice is still controversial and is accompanied by different approaches, ranging from the active use of artificial intelligence in resolving various categories of disputes (copyright disputes, commercial disputes) to criminalizing the use of artificial intelligence algorithms to predict court decisions. The national legislation does not provide for the possibility of replacing a judge with an algorithm, but it is possible to discuss the partial involvement of AI in the judicial system.

AI systems are used in countries, such as the United States, China, and France. This system represents a so-called judge's companion or digital judge (systems that replace a judge in deciding a case). Thus, the use of AI technologies in the legal sphere and legal practice is an important factor in the development of the legal system, ensuring human and civil rights and freedoms. AI is an essential tool for legal reform, a new component of its implementation technology, and a means of increasing the efficiency of implementing qualitative legal changes in the current conditions of the information society. However, in Ukraine, the introduction of artificial intelligence in justice remains a problematic issue. The first important step towards this is the actual introduction of an electronic court, which has not yet found its effective way of implementation. National justice is being modernized. This process, at least for now, seems to be a long one, and theoretical research will be needed.

A função da inteligência artificial em garantir a eficiência e acessibilidade da justiça

Resumo: As tecnologias da informação estão mudando nosso mundo de forma extremamente rápida. A disponibilidade dessas tecnologias abre novas oportunidades, mas também apresenta desafios. Isso contribui para a relevância da aplicação da inteligência artificial (IA) no sistema de justiça. A e-justiça deve facilitar o desenvolvimento do mercado digital, o que é uma tarefa essencial do governo eletrônico. A indústria jurídica sempre foi conhecida por se basear na tradição e resistir à mudança. No entanto, os recentes avanços na tecnologia de IA têm o potencial de transformar o cenário jurídico, alterando a forma como escritórios de advocacia e departamentos jurídicos trabalham. O objetivo deste artigo é esclarecer como usar a IA para melhorar a eficiência e a celeridade dos processos judiciais, além de analisar exemplos de implementação bem-sucedida de sistemas de IA no campo jurídico. O artigo identifica as vantagens e desvantagens da IA utilizada na justiça e examina a questão da acessibilidade e da justiça no contexto da IA no sistema judicial. Esta pesquisa é relevante, pois oferece uma compreensão e análise aprofundadas das novas tecnologias no contexto dos desafios jurídicos. Pode-se recorrer a esta pesquisa para o desenvolvimento de estratégias eficazes para a implementação da inteligência artificial no campo jurídico, constituindo sua implicação prática.

Palavras-chave: Inteligência artificial. Justiça eletrônica. Tecnologias da informação. Judiciário. Prática internacional. Legislação nacional.

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