Improving the Information and Legal Support of the Judicial System of Ukraine: Experience of the European Court of Human Rights

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Abstract

The research proposes a comprehensive approach to modernizing the information and legal support (ILS) of the judicial system of Ukraine, given European integration processes and the war of Russia against Ukraine. The need for substantial modernization of existing court automation systems to integrate with European systems and improve analytical capabilities for processing large data sets was identified. It was specified that the legal framework for the functioning of court information systems (IS) must be adapted to European legislation, and the organization of data warehouses and information flows must comply with EU standards. The principles of the functioning of court information systems should ensure the possibility of easy integration with the IS of the EU.

To investigate war crimes committed by Russia in Ukraine, it is proposed to establish reliable ILS, given the case law of the European Court of Human Rights (ECHR) in cases of human rights violations during conflicts. An innovative approach based on the use of artificial intelligence (AI) tools is proposed to increase the efficiency of judicial decision analysis and improve the ILS of the judicial system of Ukraine.It has been proven that the integration of the judicial systems of Ukraine and the EU is possible, provided there are reliable data analysis tools, process standardization, digitalization, data security, and integrated registers. The effectiveness of applying IT tools in the ILS of courts has been confirmed. It is proposed to establish specialized hybrid courts in Ukraine with international experts to address war crimes, harmonize legislation with international law, and implement the case law of the ECHR.

Keywords: *Information and Legal Support; Judicial System; European Court Of Human Rights; Digital Transformation; Artificial Intelligence.*

Introduction

At the current stage, the judicial system of Ukraine, like other state institutions, is at the epicenter of digital transformation. Its goal is to ensure the unity, transparency, openness, accessibility, and human-orientation of justice. In the context of the rapid development of digital technologies and their capabilities, the digitalization of legal proceedings is seen as an objective necessity for the establishment of an effective, independent, and impartial judicial system, which is an integral part of building Ukraine as a legal European state (Teremetskyi et al., 2023).

The protection of human rights is a fundamental principle of a democratic society, and ensuring such protection is one of the key tasks of the state (Cingranelli et al., 2023). In the extreme conditions prevailing in the world today, issues of security and the full functioning of state institutions to guarantee the rights and freedoms of citizens are of particular importance (Cingranelli et al., 2019). The provision of high-quality

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and fast services by the state is not just a trend, but an urgent requirement of the times. People need simple and understandable algorithms to obtain such services. Moreover, the deepening economic crisis both in Ukraine and in the world, as well as the full-scale invasion of Russia into Ukraine, are forcing the authorities to look for ways to save resources.

The digital transformation of the judicial sphere in Ukraine aims to create a citizen-friendly system, as well as a complete transition from paper document flow and correspondence to a digital format. The goal is to provide people with tangible benefits of digital services, which will save them time and effort. E-justice is a component of the State Anti-Corruption Strategy of Ukraine and aims to modernize and increase the efficiency of the judicial system (Kibenko, 2023). This will simplify document flow, accelerate case proceedings, and facilitate communication between participants in the process. For judges, this will mean less paperwork and time savings.

Digitalization is an all-encompassing process that touches all areas of work of courts, bodies, and institutions of the justice system (Kovalchuk & Teremeckyi, 2023). It is a dynamic process that is constantly evolving and changing over time. This state of affairs requires conducting scientific research in the relevant field to successfully implement digital technologies in legal proceedings, taking into account current European and global development trends and the legal framework (Aristovnik et al., 2021).

In the leading countries of the world, particularly the USA and EU countries, the latest information technologies play a key role in modernizing and increasing the efficiency of judicial systems (English et al., 2021). However, there is a constant need to process large, complex, and unstructured data sets, as well as to develop innovative tools for data collection, processing, integration, and visualization. A priority is the creation of effective methods and models for analyzing, storing, and exchanging operational data, which will ensure interaction between existing systems and standards of different EU member states, and the possibility of implementation in the ILS of the judicial system of Ukraine.

This issue has become particularly relevant in light of Russia's war against Ukraine and the prospect of European integration processes. The large-scale forced migration of Ukrainians to EU countries, as well as the close location of several EU, states to the country where hostilities are ongoing, have heightened the need to adapt the information support for decision-making in the judicial system of Ukraine to EU standards and legislation, as well as to integrate the judicial information systems of the EU and Ukraine.

In the context of Russia's full-scale invasion of Ukraine, the issue of rendering effective judicial decisions regarding the war crimes of Russians on the territory of Ukraine, which fall under various legal frameworks of international humanitarian law, national legislation of Ukraine, and the jurisdiction of international judicial bodies, is relevant. The ECHR, the International Criminal Court (ICC), and other international judicial bodies will play a decisive role in restoring justice and protecting the violated rights of those affected by Russian aggression (Ablamskyi et al., 2023). Establishing the fact of committing war crimes and their punishment is a complex task that often requires not only the interaction of the international community and judicial institutions but also reliable information support using the latest data analysis tools, such as big data and AI (Brooks et al., 2020; Teremetskyi et al., 2024). Analytical methods and scientific approaches to solving the problem of information support for judicial decision-making must comply with all legislative norms regarding processing, confidentiality, and protection of information, as well as be reliable – free from bias and discrimination against individuals or groups (Kovalchuk et al., 2023).

Under such circumstances, there is a need to study the organizational and legal foundations of information support for judicial decision-making. The relevance of this topic is reinforced by the fact that the development of innovative digital tools based on data science methods for modernizing the ILS of decision-making in the judicial system is at an initial stage. The integration of the judicial information systems of the EU and Ukraine is possible only if there are reliable data analysis tools and agreed procedures for information exchange. To form a unified IS for decision-making in the judicial system of Ukraine, compatible with similar systems in the EU, it is necessary to ensure data and process standardization, system interoperability, digitalization of judicial processes, data security, and registry integration. It is also necessary to implement innovative IT tools, such as AI, data mining, and machine learning (ML), and adapt legislation

in the field of digital technologies and data processing by EU norms. The presented research aims to propose innovative effective solutions for modernizing the ILS of Ukrainian courts, which will allow them to adapt to European standards of justice, operate effectively in wartime conditions, and comply with international human rights norms by the practice of the ECHR.

The work is structured into 5 sections. In the "Introduction" section, the relevance of researching the improvement of the ILS of the judicial system of Ukraine is substantiated in the context of ensuring the unity, transparency, openness, accessibility, and human orientation of justice. The prospects for integrating the judicial information systems of Ukraine and the EU for the formation of a unified decision-making system by European norms are outlined. The need to adapt legislation in the field of digital technologies and data processing to EU norms is identified. In the "Literature Review" section, a thorough review of scientific literature on the digitalization of legal proceedings, the implementation of European practices, and the use of AI in judicial systems is carried out. The "Methodology" section presents a comprehensive methodological approach that was applied in the research. In the "Results and Discussions" section, the current state of legal proceedings in Ukraine, the challenges of bringing those responsible for war crimes to justice, the role of the ECHR practice, and an innovative approach using AI to improve judicial decision analytics to enhance the ILS of the judicial system of Ukraine are analyzed. In the "Conclusions" section, the research results are summarized, and its limitations and prospects for future research are discussed. The new knowledge and ideas obtained in the course of this research can contribute to the development of a more effective ILS for the judicial system of Ukraine, which will comply with European legislation.

Literature Review

The digital transformation of the judicial system and the processes of European integration have drawn significant attention from the scientific community and practicing lawyers to the study of creating an effective ILS for the judicial system of Ukraine. Research into the possibilities of introducing innovative IT in the activities of courts and adapting the legal framework to European standards, in particular, the implementation of the ECHR practice to guarantee human rights in the context of Russia's active war against Ukraine, has become relevant (Kryvoruchko, 2022; Kuchuk, 2023). Many studies have been devoted to analyzing the advantages and risks of using innovative technologies, in particular machine learning and artificial intelligence, to increase the efficiency of information support for the judicial system (Mathis, 2022; Kovalchuk, 2024; Bhupatiraju et al., 2021). Karmaza et al. examined the phenomenon of AI and its use in the judicial systems of different legal states. Researchers studied the origin and evolution of AI in modern technological and information relations, its gradual penetration into various spheres of life, as well as the ways of implementing and possibilities of applying AI in the field of justice (Karmaza et al., 2021). Hovorushchenko et al. argued that the integration of information technologies into the legal system of Ukraine is aimed at ensuring equal access for all citizens to justice, introducing anti-corruption mechanisms to guarantee the independence of courts, and increasing the validity and transparency of judicial decision-making. However, during the digital transformation, it is important to maintain a balance with legislative norms regarding the security, confidentiality, and ethical use of innovative IT tools in the judicial system (Hovorushchenko, 2024).

A. Bielova analyzed the current state and prospective directions of bringing the court administration system in Ukraine closer to European standards in the context of the development of digitalization of legal proceedings. The author claimed that the digital transformation of the judicial system of Ukraine has a social and state orientation, optimization, and economic effects. This creates a unique technological space and forms extremely important prerequisites for the successful European integration of the court administration system in Ukraine, increasing the level of interaction between all its subjects, state authorities, and civil society, as well as harmonizing management decisions (Bielova, 2022). Researchers A. Rybalkin and Y. Nosenko studied the practice of the ECHR and determined the significance of the relevant practice of this body for the judicial system of Ukraine. They analyzed the activities of the ECHR, its role and its influence on legal proceedings in Ukraine. The researchers concluded that it is necessary and appropriate to implement the decisions of the ECHR in Ukrainian practice since this will ensure the protection and defense of human and civil rights and freedoms (Rybalkin & Nosenko, 2021).

Today, research on the topic of improving the ILS of the judicial system of Ukraine by harmonizing current legislation with European legal acts and digitalization of legal proceedings has become inevitable. This approach allows for increasing the efficiency and effectiveness of the functioning of the judicial system, making access to justice more prompt and accessible. Moreover, it can also enhance the transparency and reliability of the system, as well as the protection of the personal data of citizens. This issue has become particularly relevant for Ukraine in connection with Russia's full-scale invasion. Therefore, it is important to analyze the experience of the ECHR and implement its successful practices and legal initiatives in the judicial system of Ukraine

Methodology

The study employs a comprehensive methodology that combines literature analysis, legislation analysis, critical analysis, comparison, case study, and the proposition of novel IT solutions for improving the ILS of legal proceedings. The systematic method is used for a thorough review of scientific literature and legal acts regulating the ILS of the judicial system of Ukraine, the implementation of the ECHR practice, and issues of bringing those responsible for war crimes to justice during Russia's war against Ukraine. A critical analysis of existing judicial systems in Ukraine, in particular the Unified Judicial Information and Telecommunication System (UJITS), the Unified State Register of Court Decisions (USRCD), and the electronic court, was conducted. Their advantages, disadvantages, and the need for modernization by European standards were identified. A comparative analysis of Ukrainian legislation and judicial practice with European norms and the practice of the ECHR in the context of ensuring human rights during armed conflicts was performed. The case study method was applied to consider specific examples and cases of human rights violations by Russia during the war against Ukraine, as well as challenges regarding bringing those responsible for war crimes to justice. The modeling method and the experimental method were used to develop an innovative approach to improving the ILS of the judicial system of Ukraine using AI tools for automating the search, analysis, and processing of large arrays of text documents from the HUDOC ECHR database. The generalization method was used to consolidate the obtained results, formulate conclusions and recommendations, and determine further directions for improving the proposed approach. This combination of scientific methods will ensure a systematic and thorough approach to developing an effective innovative AI-based solution to improve the quality and efficiency of the ILS of the judicial system of Ukraine in the context of European integration processes.

Results and Discussions

The Current State of Information and Legal Support of the Judicial System of Ukraine

Today, the judicial system of Ukraine is at the stage of active digital transformation. The COVID-19 pandemic has significantly accelerated this process. Russia's full-scale invasion has become an impetus for the large-scale implementation of the latest information technologies in the justice system. Such innovations require the improvement of the existing ILS of justice. The legal framework regulating the ILS of the judicial system of Ukraine consists of several laws and subordinate legal acts. This set of regulatory documents covers various aspects of collecting, processing, and disseminating information related to the administration of justice in the country. In other words, the current ILS of the judicial system is regulated by a set of legislative and subordinate acts that establish requirements, procedures, and rules for working with relevant information within the functioning of the judicial branch of government in Ukraine. This includes Articles 126, 129, 130 of the Constitution of Ukraine (Law of Ukraine No. 254k/96-VR, 1996), the Law of Ukraine "On the Judiciary and the Status of Judges" (Law of Ukraine No. 1402-VIII, 2016), the Law of Ukraine "On Access to Public Information" (Law of Ukraine No. 2939-VI, 2011), the Law of Ukraine "On Access to Court Decisions" (Law of Ukraine No. 3262-IV), the Law of Ukraine "On Personal Data Protection" (Law of Ukraine No. 2297-VI, 2010), and the Law of Ukraine "On Information" (Law of Ukraine No. 2297-VI, 1992).

The automation of legal proceedings is an important direction of reforming the judicial system in Ukraine. Currently, the UJITS is in operation – an integrated system for automating court proceedings, document

management, office work, analytics, and communication between courts. UJITS ensures electronic data exchange, videoconferencing, electronic digital signature, and other services (State Judicial Administration of Ukraine, 2024). On March 16, 2024, a Law came into force that amends the Criminal Procedure Code (CPC) of Ukraine to ensure the gradual implementation of the UJITS (Law of Ukraine No. 3604-IX, 2024). Among the key innovations is the ability for lawyers to participate in court hearings via phone or tablet, as well as the remote interrogation of witnesses. According to Article 35 of the CPC, UJITS or its separate subsystems (modules) ensure, in particular, the automated distribution of materials among judges, the determination of jurors, the provision of information on the status of materials' consideration, the registration of incoming and outgoing correspondence with tracking of its movement, as well as the participation of parties to court proceedings in court hearings via videoconference (Law of Ukraine No. 2341-III, 2001).

One of the subsystems of UJITS is the "Electronic Court" system (Teremetskyi et al., 2023). It provides the opportunity to submit claims and other procedural documents in electronic form, as well as to participate in court hearings via videoconference. Within UJITS, systems for the automated distribution of court cases among judges have been implemented to avoid manipulation and ensure objectivity. A videoconferencing system is in operation, which provides the opportunity to conduct court hearings via videoconference, saving time and expenses for the movement of participants. Electronic archives are regularly formed for storing court materials, and the processes of archiving and destroying documents are automated.

However, the new realities of today and European integration processes impose new requirements on digital justice. The legal and regulatory framework for the functioning of the judicial IS must be adapted to European legislation. The organization of data storage and information flows that ensure the operation of courts must comply with European standards. The principles of operation of the IS in the judiciary must enable easy adaptation and integration with the relevant IS of the European Union. In 2002, the Verkhovna Rada of Ukraine adopted the Law of Ukraine "On the Concept of the National Program of Adaptation of the Legislation of Ukraine to the Legislation of the European Union" (Law of Ukraine No. 228-IV, 2002). One of the provisions of this Concept was the creation of a national information network of court decisions to ensure access to samples of judicial practice and the possibility of their public discussion. Within the framework of the UJITS, the Unified State Register of Court Decisions (USRCD) of Ukraine was created - an official electronic resource containing court decisions of courts of all instances in the territory of Ukraine. The legal basis of the USRCD is the Law of Ukraine "On Access to Court Decisions" (Law of Ukraine No. 3262-IV, 2006) and the resolution of the Cabinet of Ministers of Ukraine "On Approval of the Procedure for Maintaining the Unified State Register of Court Decisions" (Law of Ukraine No. 1200/0/15-18, 2018).

The USRCD is designed to ensure the openness of the courts and free access to court decisions for citizens and legal entities. The register contains court decisions since 2006 in criminal, civil, commercial, and administrative cases, as well as decisions of the Constitutional Court of Ukraine. The USRCD provides the ability to search by various parameters, such as case number, decision date, court, type of proceedings, etc. The State Judicial Administration of Ukraine is responsible for filling and administering the Register (Teremetskyi & Duliba, 2023). Access to the Register and viewing decisions is free and round-the-clock for all users. Decisions are published on the official website reyestr.court.gov.ua, except those containing state secrets or personal life information. The USRCD significantly increases the transparency and openness of the judicial system of Ukraine, promoting public access to justice (Law of Ukraine No. 3604-IX, 2024). To date, the Register stores over 16,000,000 court decisions. However, the USCED is still in test mode and provides access to documents in viewing mode only. This complicates the analytical work of participants in the judicial process, who have to study each court decision individually manually. Analysis of document content is a routine, time-consuming, and extremely laborious process. It requires manual processing, takes a lot of time from qualified employees of the judicial system, and is accompanied by so-called "human" errors.

Analytics of court decisions is an important tool for ensuring uniformity of judicial practice, increasing transparency, and predictability of justice (Zhang et al., 2021). For example, analyzing large volumes of

court decisions allows identifying contradictory decisions in similar cases in different courts or even in the same court (Park et al., 2021). This helps supreme courts to correct such discrepancies and ensure uniform interpretation of laws. By analyzing the rational parts of decisions, it is possible to identify areas where legislation is incomplete or ambiguous, leading to different interpretations. Court decision analysis is used to track trends in judicial practice over time, and changes in courts' approaches to interpreting legal norms (Nuranti et al., 2022). Analytical tools are used to assess the quality of judges' work and identify those who often make mistakes or make contradictory decisions (Mathis, 2022). With machine learning and big data analysis, models can be developed to predict likely decisions in certain categories of cases (Alghazzawi, 2022). Effective analytics requires full-text electronic databases of court decisions, powerful natural language processing, and data analysis tools. Automating the analysis of documents from the USCED based on innovative approaches and modern IT can ensure uniformity of judicial practice, increase efficiency and transparency of court decision-making, and uphold the rule of law.

Automation of judicial proceedings is a complex and lengthy process that requires significant investment and effort. However, its implementation significantly increases the efficiency of courts and the level of public confidence in the judiciary. By the end of 2027, it is planned to modernize the UJITS, which involves replacing or significantly upgrading the UJITS, modules, as well as implementing new IT systems (Khrypun, 2024).

Information and Legal Support for Russia's Responsibility for International Crimes Committed in Ukraine

The full-scale invasion of the Russian Federation into Ukraine on February 24, 2022, undermines the foundations of the modern international legal order and poses a threat to international peace and security. This unprecedented act of aggression has led to widespread violations of human rights and norms of international humanitarian law. Russia has encroached on the sovereignty and territorial integrity of Ukraine as a sovereign state, which is a gross violation of international law. Mass killings of civilians could be considered war crimes and crimes against humanity. The destruction of civilian infrastructure and residential buildings as a result of shelling and bombing violates the principle of distinguishing between military and civilian objects. Numerous cases of torture, ill-treatment, and sexual violence against civilians and prisoners of war are a direct violation of the Geneva Conventions (International Humanitarian Law Databases, 1949). The deportation of civilians, including children, to the Russian Federation may qualify as the crime of population transfer. Deliberate attacks on medical facilities, schools, and kindergartens are contrary to the norms of international humanitarian law (Melzer & Kuster, 2017).

These and other facts require a thorough investigation and bringing those responsible to account for the crimes committed. The ECHR and other international judicial bodies will play a decisive role in restoring justice and protecting the violated rights of those affected by Russian aggression. The ECHR considers cases of human rights violations during armed conflicts and war crimes, including the right to life (Article 2 of the Convention for the Protection of Human Rights and Fundamental Freedoms); the right to freedom from torture, inhuman or degrading treatment (Article 3 of the Convention); the right to liberty and security of person; state responsibility for acts of their armed forces (Council of Europe, 2024). The ECHR's practice establishes clear standards for the protection of human rights during armed conflicts and helps overcome impunity for war crimes by ensuring effective investigations, fair trials, and compensation for victims.

Russia's aggressive war against Ukraine undermines the fundamental principles of the international legal order established after World War II and requires bringing those responsible to justice at the international level. First of all, this concerns the criminal responsibility of individuals involved in the planning, preparation, unleashing, and waging of an aggressive war against Ukraine, as well as the commission of war crimes and crimes against humanity. This applies to the highest political and military leadership of the Russian Federation. Investigations can be conducted by the ICC or a special tribunal (Ablamskyi, 2023).

The list of war crimes is growing rapidly, but Article 8 of the Rome Statute states that the crime of aggression can only be committed by "a person in a position effectively to exercise control over or to direct the political or military action of a State" (UN, 1998). Soon, it is unlikely that any Russian official will appear

before any tribunal - international, hybrid, or otherwise. The limited resources and system of complementary jurisdiction of the ICC mean that only those most responsible for massive grave crimes in Ukraine will be prosecuted. This leaves a significant gap regarding accountability for violations of international humanitarian law in Ukraine committed by enlisted personnel and non-commissioned officers. Addressing the lack of accountability and preventing impunity for all international crimes, not just aggression, should be the main goal of the international community in the field of criminal justice regarding grave crimes in Ukraine.

According to statistics released by the Prosecutor General's Office of Ukraine, during 2022-2023, 12,331 criminal proceedings for war crimes were opened under Article 438 of the CPC of Ukraine (Criminal Procedure Code of Ukraine, 2006), which provides for criminal liability for violations of the laws and customs of war. Of these, 108 proceedings were suspended by Part 2 of Article 280 of the CPC of Ukraine (CPC of Ukraine, 2006) due to the failure to establish the whereabouts of the suspect. In 223 criminal proceedings, the suspect was served with a notice of suspicion, and in 84 of them, the prosecutor sent an indictment to court. Another 38 cases were closed (Office of the Prosecutor General of Ukraine, 2024).

Such a large number of criminal proceedings undoubtedly creates significant difficulties. Active hostilities are dealing a devastating blow to the judicial system. In addition to the general challenges facing the Ukrainian justice system, the huge number of cases exposes another problem common to all national jurisdictions - the lack of competence and general knowledge among prosecutors and judges about the complex international legal standards related to the prosecution of war criminals. Domestic court proceedings for war crimes in Ukraine must meet international standards.

Prosecution of war crimes under the principle of universal jurisdiction can become a vital tool for ensuring accountability for serious violations of international humanitarian law in Ukraine. This could partially reduce the burden on the Ukrainian judicial system, especially in complex cases. However, the lack of effective legal mechanisms for long-term solutions, such as a Special Tribunal on the Aggression against Ukraine or a hybrid alternative, remains a serious problem. One of the most comprehensive initiatives regarding international criminal accountability in Ukraine is the public international law and policy group's proposal to establish a Ukrainian High War Crimes Court (Draft Law for a Ukrainian High War Crimes Court, 2023). The proposed bill provides for the establishment of a "narrowly specialized court within Ukraine's judicial system" with jurisdiction over the four crimes within the ICC's jurisdiction: genocide, crimes against humanity, war crimes, and the crime of aggression. The bill defines these offenses by the Rome Statute (UN,1998), referring to the definitions in Ukrainian legislation (CPC of Ukraine, 2006).

The existing judicial mechanisms in Ukraine are insufficient for the competent and fair prosecution of the huge number, approximately 100,000, of potential war criminals (Office of the Prosecutor General of Ukraine, 2024). The ICC will also not be able to consider such a huge number of cases, nor will any international tribunal. None of the more than 121,000 potential war criminals awaiting trial in Ukrainian prisons are accused of the "most serious" crimes. The establishment of an extraordinary national tribunal could close the gap in holding perpetrators of international crimes in Ukraine accountable. It would provide an important additional platform for prosecuting large numbers of enlisted and non-commissioned perpetrators who might otherwise evade justice. New approaches need to be developed for forming international legal instruments for Ukraine and creating an effective judicial system capable of criminally prosecuting brutal war crimes on an unprecedented scale.

The ECHR is a supranational judicial body established within the Council of Europe. It was founded in 1959 based on the European Convention on Human Rights to ensure respect for human rights by the member states of the Council of Europe. The ECHR considers individual or state applications concerning violations of civil and political rights provided for by the Convention. Its jurisdiction is binding on all member countries of the Council of Europe. The ECHR's case law serves as the basis for harmonizing national legislations by the Convention and pan-European human rights standards (Council of Europe, 2024). Ukraine ratified the Convention in 1997, recognizing the jurisdiction of the ECHR (Law of Ukraine No 475/97-VR, 1997). Decisions of the ECHR are binding for enforcement in Ukraine after their translation into Ukrainian.

The practice of the ECHR is of great importance for Ukraine and serves as a guideline for improving the national judicial system and law enforcement. ECHR decisions can reveal inconsistencies between Ukrainian legislation and the Convention and stimulate the necessary changes. Courts in Ukraine must interpret national legislation in light of the ECHR's practice. Proper consideration and application of the ECHR's practice by courts and public authorities in Ukraine is an important factor in moving closer to European democratic values and the rule of law. The implementation of the ECHR's practice has become extremely relevant after Russia's full-scale invasion of Ukraine on February 24, 2022.

The ECHR's practice in dealing with war-related cases is extremely important in the context of Russia's military aggression against Ukraine. The ECHR examines cases concerning the death of civilians and military personnel during armed conflicts for violations by states of obligations under Article 2 of the Convention (the right to life). It assesses the necessity and proportionality of the use of force. Under Article 3 (prohibition of torture), the Court examines complaints about the inhuman treatment of prisoners of war, civilians, conditions of detention, etc. Judgments have already been rendered against Russia in cases concerning events in Chechnya (Council of Europe, 2024). By Article 5 (right to liberty), the ECHR analyzes the legality of the detention of civilians and military personnel during armed conflicts and the conditions of detention. The ECHR considers cases of violations of private and family life as a result of military actions, and occupation of territories, guaranteed by Article 8 (right to respect for private life). By Article 1 of Protocol 1 (protection of property), the Court assesses the proportionality of restrictions on property rights due to military circumstances, the legality of expropriations, and compensation for damages. On the issue of jurisdiction and responsibility, the ECHR determines the existence of a state's jurisdiction under Article 1 of the Convention in the territory of an armed conflict and allocates responsibility between states. The ECHR's practice serves as a guideline for ensuring fundamental rights during war and assessing the legality of states' actions in these situations by the Convention (Council of Europe, 2024).

The ECHR is holding a Grand Chamber hearing in the case of Ukraine v. Russia concerning Crimea. The case concerns Ukraine's accusations of a series of violations by the Russian Federation of the European Convention on Human Rights in Crimea, starting in February 2014. It also concerns the transfer of Ukrainian "convicts" to Russian territory and accusations of persecution of Ukrainian "political prisoners" (Information Note on the Court's case-law 247, 2020). Ukraine has four inter-state cases against Russia, including one joint case with the Netherlands. There are also over 7,400 individual applications pending regarding events in Crimea, eastern Ukraine, and the Sea of Azov, as well as Russia's military operations on Ukrainian territory since February 24, 2022 (Council of Europe, 2024).

However, active hostilities have been ongoing in Ukraine for the third year now. This significantly complicates the judicial process against war criminals and holds the perpetrators accountable from both a legal and practical point of view. Determining jurisdiction for trying war crimes cases is a critical issue. It could be a Ukrainian court, where crimes are currently being committed on a massive scale, international tribunals (e.g., the ICC), or specially established hybrid/mixed courts. Collecting evidence of war crimes during active hostilities is an extremely difficult process due to limited access to crime scenes, risks to investigators, and destruction of physical evidence. Satellite imagery, video, and eyewitness testimony play an important role. In this sense, the use of innovative IT such as big data, data mining, and AI is effective. In particular, they are used to search for missing persons or identify war criminals from photographs of individuals or crime scenes. AI tools are already capable of processing large amounts of information to detect implicit patterns and non-obvious relationships (Brooks et al., 2020). AI language models can extract entities and facts from document collections, identify individuals by voice or image, and determine locations from images. However, such technologies are not without bias and can only be applied to constitutional and legal norms, social justice, and ethical principles to ensure the protection of individual rights and freedoms (Ablamskyi et al., 2020). The use of real-time facial recognition technology without proper procedural safeguards and supervisory control mechanisms provided for by law violates Article 8 of the Convention for the Protection of Human Rights and Fundamental Freedoms (Council of Europe, 2024). This article protects the right to respect for private and family life. The absence of clear legislative norms regulating the use of this technology and ensuring the protection of the right to privacy makes such use of facial recognition unacceptable from the point of view of the Convention and the ECHR's legal positions.

Detaining suspected war criminals during wartime requires coordinated operational actions by the military, law enforcement, and international missions. It is often necessary to wait for active hostilities to cease. It is also necessary to ensure proper observance of the procedural rights of the accused by international standards, including the right to defense and a fair trial. The success of war crimes investigations depends on effective cooperation between states, courts, and international organizations in exchanging information, arrests, extradition of suspects, etc. Despite the difficulties, holding war criminals accountable is a critical task for restoring justice and the rule of law. Therefore, it is important to improve the information and legal support of Ukraine's judicial system today. This requires the introduction of the latest IT in all judicial processes and the development of an appropriate legal framework that will meet European standards for human rights protection and ECHR requirements. Ukraine's integration into the EU judicial system and implementation of the ECHR's practice requires modernization of the Ukrainian judiciary. This involves digitization of all court processes, creation of unified national electronic registers and databases, ensuring free public access to court decisions and case files, introduction of AI technologies for processing judicial information, adoption of legislation on cybersecurity, personal data protection, and access to public information by European directives. Only a comprehensive update of the legal and information support of the judiciary will allow Ukraine's judicial system to fully integrate into the European legal space.

AI Tools in the analysis of European Court of Human Rights decisions

The ECHR has its database called HUDOC (Human Rights Documentation), which contains decisions, judgments, summarized conclusions, and other official documents. Searching in this database is the main source for finding relevant documents. To effectively select documents, you need to use various search criteria, such as keywords, application numbers, specific Convention articles, countries, languages, etc. Using the right search queries allows you to get more relevant results. ECHR documents are available in different languages, so translation into the required language may be needed. ECHR judgments and decisions have a certain standard structure, which includes an introductory part, a statement of facts, a legal assessment, and a final decision. The ECHR is guided by its system of legal principles and case law. Therefore, when analyzing documents, it is necessary to take into account these principles and previous decisions relating to similar cases. To facilitate analysis, the ECHR offers various analytical tools, such as thematic overviews, guides to the Court's practice, and analytical reviews. Since the practice of the ECHR may change over time, more recent decisions may reflect a more current position of the Court. In general, the analysis of ECHR documents requires legal competence, careful study of the structure and context of documents, as well as an understanding of the principles and precedents on which the Court's work is based.

However, searching and analyzing documents at the ECHR is a routine manual time-consuming process. Using AI can significantly improve ECHR decision analytics. In particular, Natural Language Processing (NLP) tools allow automatic analysis of huge volumes of court decision texts, identifying legal concepts, norms, precedents, etc. This significantly accelerates and facilitates the search and systematization of relevant ECHR practice. Using ML methods based on historical ECHR decisions can enable the creation of systems that will suggest the most likely decisions in new cases based on their factual circumstances. AI systems can effectively identify inconsistencies or contradictions between new ECHR decisions and its previous practice, as well as analyze deviations from legal positions. AI tools can help find relevant connections between different cases based on common legal norms, concepts, or factual circumstances. AI can analyze the potential implications of ECHR decisions for national judicial systems and legislation, identifying the need for amendments. AI tools learn to generate texts of decisions, justifications, and comments based on the analysis of existing ECHR practice. The application of AI Tools opens up new opportunities for more effective analysis and use of ECHR case law by lawyers, scholars, and judicial bodies.To automate the search and analytics of relevant information in ECHR documents, an innovative approach based on the use of AI tools has been proposed (Fig. 1).

Figure 1. Schematic representation of the proposed approach to analyze relevant information in ECHR case documents

Source: compiled by the authors

In the model presented in Fig. 1, it is proposed to use parsing to automatically extract ECHR documents from the HUDOC database that meet the given selection criteria for further processing. Parsing is the process of studying and analyzing the structure of input data, usually textual, according to established rules and grammar (Slivnik & Mernik, 2023). It determines the syntactic structure of the input information for further processing. This method allows obtaining a dataset that contains all documents from HUDOC relevant to the defined search conditions. For example, all lawsuits against Russia from other states or all documents containing historical examples considered to be violations of the right to life, etc. The formed dataset can be used for further in-depth analysis of ECHR documents using NLP and Natural Language Generation (NLG) methods.

These are two closely related but different areas in the field of AI. NLG is the process of automatically creating human-understandable texts in natural language using computer systems and algorithms. The main goal is for systems to be able to generate coherent, grammatically correct, and meaningful texts, such as answers to questions, dialogues, reports, news stories, etc., based on structured data or internal knowledge. NLP is a branch of computational linguistics that deals with developing methods and algorithms for analyzing, understanding, and transforming text or speech into formalized, structured representations that can be processed by computer programs (Chang, 2023).

To generate relevant entities (names, dates, titles, etc.), facts, and circumstances, the large language model OpenAI GPT-4 was used (Fig. 2).
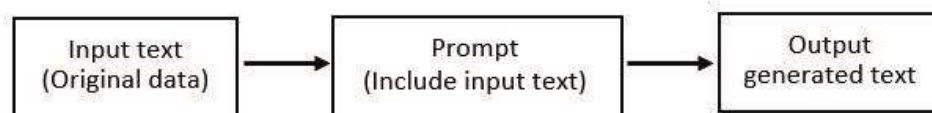

Figure 2 Workflow of Natural Language Generation Process

Source: compiled by the authors

The workflow depicted in Figure 2 commences with the original input text, which serves as the initial data source. This input text then undergoes a prompting stage, wherein it is utilized to formulate a prompt. Subsequently, this prompt is employed to generate the output text.

The HUDOC database stores documents written in various languages. GPT-4 can be used for high-quality translation from English into any other official language, or vice versa. Moreover, this language model is capable of recognizing the language from which translation needs to be performed.

Applying NLP methods to analyze documents from the ECHR database can increase the efficiency of analyzing large volumes of textual data. The HUDOC database contains a huge number of decisions, making human analysis a laborious and time-consuming process. NLP tools can significantly accelerate and

facilitate the processing of this data. These algorithms can identify certain patterns, regularities, and trends in large sets of textual data that are difficult for a human analyst to notice. With NLP, documents can be classified by topic, jurisdiction, Convention article, etc., which facilitates the search and organization of relevant information. NLP methods allow automatically extracting information about key objects, organizations, locations, dates, and other facts from unstructured textual data. NLP can help identify textual repetitions, which is useful for finding similar practices. Natural language understanding methods allow for a deeper analysis of texts, taking into account context and semantic connections. With NLP, the search for quotes and references to previous court decisions can be automated, simplifying legal analysis. Applying NLP to process the huge array of textual data from the ECHR can significantly increase the productivity of analytical work, improve the quality of analysis, and help identify hidden trends and patterns in judicial practice, thereby increasing the efficiency of the information retrieval system of the Ukrainian judicial system.

Conclusions

The article proposes a comprehensive approach to improving the information retrieval system of the Ukrainian judicial system given European integration processes and Russia's war against Ukraine. It has been studied that existing litigation automation systems, such as UJITS and USRCD, need substantial modernization to integrate with European judicial systems and improve analytical capabilities for processing large volumes of judicial data.

It is noted that the legal framework for the functioning of litigation information systems must be adapted to European legislation. The organization of data repositories and information flows that support the activities of courts must comply with European standards. The principles of information system functioning in the judiciary must ensure the possibility of easy adaptation and integration with relevant information systems of the European Union.

The issue of forming a reliable information retrieval system to ensure Russia's accountability for international crimes committed in Ukraine is considered. The practice of the ECHR in dealing with cases related to human rights violations during armed conflicts has been studied. The importance of implementing this practice in Ukraine to improve the information retrieval system of the national judicial system is emphasized. It is noted that the introduction of innovative AI tools can significantly increase the efficiency of working with textual documents from the practice of the European Court. It is determined that the modernization of the information retrieval system of the Ukrainian judicial system should meet European standards and the practice of the ECHR, which will effectively investigate and bring those responsible for war crimes to justice, ensuring proper protection of human rights.

It has been established that the integration of EU and Ukrainian judicial information systems is possible only if reliable data analysis tools and agreed information exchange procedures are in place. The need to ensure data and process standardization, system interoperability, digitalization of judicial processes, data security, and integration of court decision registers has been noted. The effectiveness of implementing innovative IT tools, such as AI, data mining, and ML in the information retrieval system of the Ukrainian judicial system has been proven. The need to adapt Ukrainian legislation in the field of digital technologies and data processing by EU norms has been emphasized.

It is noted that the automation of document analysis from the UJRS based on the use of innovative approaches and modern IT can ensure the unity of judicial practice, increase the efficiency and transparency of judicial decision-making, and uphold the rule of law. An innovative approach using AI technologies for automating the search, analysis, and processing of large volumes of textual documents from the HUDOC database is proposed to increase the efficiency of judicial decision analysis.

It is proposed to establish specialized hybrid courts in Ukraine with the participation of international experts as an effective mechanism for considering cases of war crimes in addition to the efforts of the ICC. At the same time, it is necessary to harmonize Ukrainian legislation with international law norms and implement the practice of the ECHR. An urgent need is the digitalization of judicial proceedings and the creation of

electronic registers and databases compatible with European ones with open access. Only a comprehensive modernization of the information retrieval system of the Ukrainian judicial system will allow it to integrate into the European space and effectively restore justice in the conditions of war.

The next stage of our research will be to study the possibilities of harmonizing Ukrainian legislation with international law norms and the application of smart technologies in the context of investigating war crimes and protecting human rights during armed conflict.

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