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Address: 42 Moskovskaya Str., 420111 Kazan, Russian Federation
Tel.: +7 (843) 231-92-90
Fax: +7 (843) 292-61-59
E-mail: lawjournal@ieml.ru
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Kazan Innovative University named after V. G. Timiryasov. Address: 42 Moskovskaya Str., 420111 Kazan, Republic of Tatarstan, Russian Federation. Tel.: +7 (843) 231-92-90. Fax: +7 (843) 292-61-59. E-mail: info@ieml.ru. Website: https://ieml.ru

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Digital Transformation of Law: Modern Challenges and Prospects for Regulation

Ildar R. Begishev
Kazan Innovative University named after V.G. Timiryasov, Kazan, Russia

Elizaveta A. Gromova
South Ural State University (National Research University), Chelyabinsk, Russia

This issue contributes to the study of one of the most pressing topics of modern legal science – the legal system interaction with artificial intelligence technologies, the digitalization of judicial processes, and the transformation of legal consciousness under the digital revolution. The research articles collected in this volume reflect the multidimensional nature of the challenges faced by the legal doctrine and suggest specific ways to overcome them.

First of all, one should note that the digital transformation of law is not an abstract theoretical issue. On the contrary, it is a practical reality that many countries of the world are experiencing, from developed democracies to countries with emerging legal systems. At the same time, the introduction of digital technologies into the administration of justice and legal regulation exposes deep contradictions between technological capabilities and the requirements of fairness, between the speed of data processing and human dignity, between algorithmization and legal uncertainty.

In this regard, the research articles presented in this issue highlight various aspects of this process and, as we hope, will serve as a basis for further constructive scientific discussion.

One of the key topics of the issue is using large language models and artificial intelligence systems in criminal proceedings. The article by **Mikhail Spiridonov (Russia)** contains a detailed analysis of the opportunities and risks associated with the use of neural networks (ChatGPT, Claude, YandexGPT, and others) in law enforcement. The author convincingly demonstrated that the quality of the results obtained using such tools largely depends on the prompt quality and structure, as well as on the availability of relevant legal sources and judicial practice in the model "knowledge". Moreover,

the study showed that it is advisable to use generative AI models only as an auxiliary analytical tool with a mandatory legal verification of the results obtained. Thus, the article provides a methodological basis for responsible implementation of artificial intelligence technologies in legal practice.

Secondly, the issue contains a number of papers devoted to an empirical analysis of the implementation of digital systems in various jurisdictions. The work of **Walter T. Chikwana (Zimbabwe)** describes the phased implementation of an electronic case management system in Zimbabwe. The author identified both the positive results of digitalization (increased transparency, faster case management, reduced corruption) and existing challenges (the need for staff training, investments in technological infrastructure, and resistance of traditional procedures). A similar practice-oriented approach is used in the article by **Solomon Girma Taddesse (Ethiopia), Vidhyanshi Bhanwar (India)** and **Shruti Verma (India)**, who analyzed the development of online dispute resolution mechanisms in India. The authors emphasize that technological solutions should be integrated into the local institutional realities and take into account the specifics of access to justice in developing countries. Therefore, a universal model of digitalization is impossible; adaptation to the specific socio-economic conditions and legal traditions of each jurisdiction is required.

Thirdly, the issue pays considerable attention to the problems of legal regulation of digital technologies. The article by **Anthi Koskina (Greece)** raises the urgent question of legal gaps in the regulation of the use of artificial intelligence technologies in the space sector. The author argues that traditional international legal instruments, including the 1967 Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies, are insufficiently adapted to the new challenges associated with the systems autonomization and potential militarization. In this regard, the work by **Ildar Begishev (Russia)** proposes the concept of an international convention aimed at prohibiting the development, production and use of autonomous weapons systems. The article substantiates the urgency of a global legal response and suggests specific mechanisms for international cooperation. Thus, the authors demonstrate that legal regulation should be proactive, internationally coordinated and take into account not only technical capabilities, but also existential risks.

A special place in the issue is occupied by the work of **Marina Alekseeva (Russia)** and **Svetlana Rybak (Russia)**, dedicated to the problem of cyberaddiction among young people. The authors transfer the discussion of digital risks from the technical-organizational level to the level of social psychology, pedagogy, and legal education. The study convincingly showed that the problem of digital addiction requires an integrated approach, including legal regulation, educational initiatives, psychological support, and the formation of a value system among the younger generation. This contribution is particularly important for the development of public policy in the field of protecting the rights and interests of children and youth in the digital space.

Analysis of all the materials in the issue allows identifying several fundamental conclusions that are important for both the scientific community and practitioners.

First of all, the digital transformation of law is not a one-dimensional process, but a complex interaction of technological capabilities, legal norms and institutional structures. As a result, the formation of an effective regulatory environment is possible solely by consolidating scientific, technical, and socio-humanitarian knowledge. Consequently, its regulation requires an interdisciplinary approach and close cooperation between specialists in various fields of knowledge – lawyers, politicians, philosophers, psychologists, economists, mathematicians, computer scientists, programmers, roboticists, electronics engineers and other specialists in engineering and technical spheres. A dialogue between representatives of various professions and disciplines is not just desirable, but objectively necessary to develop balanced and sustainable regulatory solutions that meet the needs of the modern digital society.

Secondly, the effective use of digital technologies in the legal field is impossible without the development of quality standards, verification procedures and ethical standards. As the works published in this issue show, the mechanical implementation of AI tools without proper methodological preparation and critical thinking may lead to the aggravation of existing problems.

Thirdly, during the implementation of digital technologies, we should pay special attention to the protection of fundamental human rights. Automated decision-making, algorithmic resource allocation, and digital surveillance can significantly increase structural inequalities, especially among vulnerable populations. Therefore, regulation should be aimed not only at stimulating digital innovations and technologies, but also at guaranteeing justice, humanism, and equality of citizens.

In addition, it is becoming obvious that the legal regulation of digital technologies cannot be exclusively a national matter. The cross-border nature of digital networks, the global scale of operations of large technological corporations, and the common challenges require coordinated international actions. However, such actions should be sensitive to national features.

This issue of the Journal demonstrates that the academic community is capable of a serious, balanced understanding of law digitalization. The authors of the articles abstain from simplified solutions and share neither technological optimism nor pessimism. They offer analytical tools, practical recommendations, and conceptual mechanisms for understanding these complex phenomena.

In conclusion, I would like to express my gratitude to the authors for their attentive and responsible attitude to their chosen research topics, to the reviewers for the high-quality reviews of the submitted materials, and to our editorial staff for supporting this initiative. We are convinced that the materials in this issue will be useful not only to researchers and teachers, but also to judges, legal advisers, legislators, law enforcement officers, and government officials seeking to develop effective and fair policies in the field of law digitalization.

We continue to consider our Journal as an open platform for discussing issues facing legal science and practice in the context of technological change. We invite our colleagues to actively participate in this important scientific discussion.

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Possibility of Using Publicly Available Neural Networks in Criminal Proceedings

Mikhail S. Spiridonov

South Ural State University (National Research University), Chelyabinsk, Russia

Keywords

criminal law,
criminal proceedings,
digital technologies,
experiment in law,
generative artificial intelligence,
law enforcement,
law,
neural networks,
prompt,
sentencing

Abstract

Objective: to experimentally check the ability of publicly available neural networks to solve formalized criminal law problems with a pre-established normatively correct result.

Methods: a set of complementary methods of scientific cognition helped to achieve the work objective. The methods of analysis and synthesis, induction and deduction formed the general scientific basis, which made it possible to systematically comprehend the issues under study. Among special legal tools were formal legal analysis and official interpretation of legal norms, which ensured the rigorous normative assessment of the results obtained. The key empirical research method was a controlled experiment, organically combined with modeling law enforcement situations and a comparative analysis of the answers of six publicly available neural networks to identical criminal law problems.

Results: during the experiment, publicly available neural networks showed significant discrepancies in the accuracy and consistency of answers to formalized criminal law problems: none of the tested models demonstrated a stable and error-free result. In the absence of direct reference to the relevant legal sources, the models systematically made mistakes when determining the term of conviction expungement, applying the rules for sentencing, and determining the type of recidivism of crimes. This indicates reproductive rather than analytical-legal nature of the models. Providing accurate quotations from regulations and explanations of the Russian Supreme Court Plenum significantly improves the correctness of answers from certain neural networks. The most and least effective models were identified, as well as the basic

requirements for drafting a legally correct query in the field of criminal proceedings.

Scientific novelty: the study is an attempt to experimentally check the capabilities of publicly available neural networks in relation to specific criminal law problems with a pre-established normatively correct answer. The results obtained made it possible to propose the typology of errors made by neural networks, reveal their procedural causes, and identify the fundamental limitations of using generative artificial intelligence in law enforcement.

Practical significance: the results can be used in law enforcement and education: to determine the acceptable limits of using publicly available neural networks in criminal proceedings; to develop methodological recommendations for making legally correct queries to generative artificial intelligence systems; and to prevent typical errors when using neural networks in professional legal activity.

For citation

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Contents

Introduction

There were several reasons for writing this article. The first reason is the growing discourse among judicial officials about the incredible prospects of using artificial intelligence (AI) tools in court proceedings and using them to improve the work of both the judicial system in general and any single judge in Russia. This suggests that these statements either are based on some unpublished research that has shown amazing results in the AI effectiveness in legal practice, or, more likely, are a manifestation

of the general naively positive opinion about AI. The second reason is the personal curiosity of the author. It seems very tempting to shift some of the work of a professional criminal lawyer to a virtual assistant, especially when their knowledge base and search abilities are promised to far exceed the average human capabilities.

At first glance, the possibility of using AI in various fields, for example, in legal education (Danielyan, 2024) or in checking local draft laws (Ke Wang, 2023), really does not seem a fantastic and remote prospect. Along with this, recent publications have expressed opinions about the limited capabilities of these systems (Callister, 2020). They note the opacity and unpredictability of AI technologies, potential risks to people's rights and guarantees, such as privacy, the right to non-discrimination, and a fair trial (Buzova, 2024; Vlasova, 2025; Vorozhevich, 2025; Dedov, 2023; Zharova, 2025; Kalyatin, 2024; Karczkhiya, 2024; Kravchenko, 2025; Chebodaeva, 2023; Farinella & Gulyaeva, 2024). Researchers skeptically assess the potential of these technologies in resolving legal conflicts, stating their greater usefulness as a means of documenting and systematizing regulations (Navarro-Dolmestch & Fuentes-Loureiro, 2023). Some authors also reasonably point out the risks associated with the use of generative AI in justice, such as generating incorrect but plausible results (Kirpichev, 2024).

The relevance of the topic is confirmed by the fact that publications on the AI practical application very poorly reflect legal sphere (Avdoshin et al., 2024; Avetisyan, 2024; Andrianov et al., 2024; Baryshnikov, 2022; Betelin, 2024; Eremin & Selenginsky, 2023; Kobrinskii, 2024; Oborotistov & Muraev, 2023; Orlov, 2025; Raikov, 2024; Razumov & Dus, 2024; Rimshin & Kucherenko, 2024; Sayfullin et al., 2023; Sozaeva, 2024). It is most interesting to experimentally study the capabilities of modern publicly available neural networks in solving ordinary legal problems that may arise in a criminal case. It is worth noting that we are interested in exactly those neural networks that anyone can freely use today. If these tools can be used to correctly answer certain legal questions, this will indicate a prospect of developing specialized neural networks for a specific area of law enforcement. Accordingly, this is the thesis that this study aims to verify.

1. Methods and tools

1.1. Description of neural networks participating in the study

The following publicly available neural networks (further – NNs) (as of November 2025) were used for this study:

– YaGPT (YandexGPT);
– ChatGPT 5;
– Claude Sonnet 4.5;
– GigaChat;
– DeepSeek;
– Perplexity (actually, an aggregator of several neural networks).

These NNs' functioning is based on the transformer architecture, when a model trained on a huge set of data analyzes the context and generates text. It identifies statistical patterns in the language and builds mathematical connections between words, i.e. simulates understanding through calculations.

These tools employ such methods of automatic text processing in natural language as supervised learning, unsupervised learning, and partially supervised learning (Belov et al., 2020). Large language models are generators of tokens (a minimal unit of text to which a numerical representation is assigned) able to consistently predict them, thereby completing documents. At the same time, despite the current development of large language models, the basic principle of their operation remains the same – it is a tool for completing documents (Berryman & Ziegler, 2025).

Hence, when formulating a request for such an NN, it is necessary to convey the user's task and the accompanying context so that the model can help find a solution.

1.2. Formulating a prompt

The publicly available NNs selected for this study appear in the form of a dialog box in which the user writes a question (request) and receives a written answer to it. Given this mode of operation, the user's request must meet certain standards to obtain a correct result. The quality of the query correlates with the accuracy (correctness) of the NN's response.

Currently, there is a wide variety of literature on making queries to NNs (prompt engineering), which describes the basic requirements for them. For example, some authors suggest the following order of making queries to NNs: set the area (describe in detail the desired style or specify the appropriate personality); specify the format (define the rules that the model should follow and the response structure); give examples (add a few examples of the correct solution to the problem); evaluate the quality (find errors, evaluate the answers and determine what affects the response quality); divide the task into subtasks (break down complex tasks into related stages) (Phoenix & Taylor, 2025). One can also find such requirements for a prompt: initially, clearly identify the purpose of the request; think over the desired outcome; determine the format for presenting the outcome; structured the request into paragraphs; use precise wording and specialized terms in the request; explicitly specify the initial conditions and set the level of response detailization; set instructions and rules at the beginning of the request (Kuzmenko, 2025).

Hence, based on the above requirements, the following request was made:

1. Read the question carefully.
2. Answer the question with maximum accuracy.
3. For each key part/thesis of your answer:

– Evaluate confidence (on a 1–100 scale).

– Clearly state whether this is accurate knowledge or an assumption/logical conclusion.

4. If confidence in any part is <70/100, obligatorily suggest an alternative or clearly warn about possible inaccuracy/incompleteness.

5. Formulate three different answers to this question, each with a confidence score as indicated. Choose the most reliable answer.

6. Provide sources, if known.

7. Your role is a judge of a Russian district or city court. You are well-versed in the criminal-procedural legislation of Russia, and you have extensive theoretical and practical experience.

8. In responding to this request, refer to: the Criminal Procedural Code of the Russian Federation; the Criminal Code of the Russian Federation; Resolutions of the Plenum of the Supreme Court of the Russian Federation, including Resolution of the Plenum of the Supreme Court of the Russian Federation No. 14 dated 06/07/2022, and Russian judicial practice on this issue (take practice only from verified sources – https://www.vsrf.ru, www.consultant.ru, https://www.garant.ru, https://sudact.ru, websites of the Russian general jurisdiction courts); always check the relevance of the information.

9. If the information (regulations, online resources, etc.) may be outdated or invalid, obligatorily report it.

10. Carefully study all the contents of the sources, without missing a single point.

11. Make sure that every detail, question or point presented in the materials is taken into account and analyzed.

12. Answer format:

12.1. Give an answer with a detailization level of 100 out of 10.

12.2. When responding, use clear, non-ambiguous language.

12.3. All notes about possible outdated information and verification of sources should be explicit and understandable to the user.

12.4. When responding, reflect the received information as accurately as possible, relying on all sections and details of sources, files and text.

12.5. If the analysis shows that the legal issue does not have an unambiguous answer (i.e., there are varying judicial practices, conflicting legal norms or expert opinions on it), clearly indicate that the issue is debatable, which point of view is preferable and why.

12.6. Do not pass off hypotheses or guesses as an established legal fact.

Using the above request, neural networks were asked to solve the following criminal law problems:

Ivanov, an adult citizen of Russia, was sentenced by the verdict of the Kalininsky District Court of Ufa dated 12.10.2021 under Part 1 of Article 264.1 of the Russian Criminal Code to 1 year of imprisonment on probation for 1 year, with deprivation of the right to engage in activities related to driving vehicles for a period of 1 year and 6 months. The verdict entered into force on 12.11.2021. Ivanov was again detained for driving under alcohol on 01.06.2023. Question: Can Ivanov's actions be qualified as a crime, and if so, under what article of the Russian Criminal Code will they be qualified?

An adult citizen Petrov was convicted twice.: 1) on 05.11.2023, by the Ivanovo District Court under paragraph "b" of Part 2 of Article 158 of the Russian Criminal Code to 6 months of imprisonment in a general regime correctional colony, released on 05.05.2024 after serving his sentence; 2) on 12.08.2024, by the Ivanovo District Court under Part 1 of Article

161 of the Russian Criminal Code to 1 year of imprisonment to be served in a high-security penal colony. On 10.06.2024, Petrov stole a jacket worth 10,000 rubles. For this crime, he was sentenced on 10.09.2024 by the Ivanovo District Court under paragraph "b" of Part 2 of Article 158 of the Russian Criminal Code to 1 year in prison. Based on Article 70 of the Russian Criminal Code, by the totality of sentences, the unserved part of the sentence of 12.08.2024 was partially attached to the imposed punishment. One year and 6 months of imprisonment were finally imposed, to be served in a high-security penal colony. According to the latest verdict, the court recognized Petrov's actions as a dangerous recurrence of crimes. Questions: 1) is the final punishment correctly imposed in the verdict of 10.09.2024? 2) is the recidivism of crimes correctly established in this verdict?

1.3. The expected outcomes and the assessment criteria

Both problems are taken from real judicial practice. The first is based on criminal case No. 1-230/2022 (UID 76RS0013-01-2022-000945-09) in relation to a citizen Chernykh, considered by the Rybinsk City Court of the Yaroslavl region on 18.04.2022 with a verdict of guilty.

The circumstances of the case are as follows: Chernykh was sentenced on 03.07.2018 by the magistrate of the judicial district No. 3 of the Rybinsk Judicial district of the Yaroslavl region under Article 264.1 of the Russian Criminal Code to 11 months of imprisonment, suspended for a probation period of 2 (two) years with deprivation of the right to engage in activities related to driving vehicles for a period of 2 (two) years and 8 (eight) months. The imprisonment was served on 03.07.2020, the deprivation of the right to engage in activities related to driving was served on 13.03.2021. After that, on 02.02.2022 at about 00:55 am, Chernykh in a state of alcoholic intoxication drove a Renault Sandero car near 33 Tolbukhina Street in the city of Rybinsk, Yaroslavl region. The court of first instance qualified these actions as driving a car by a person who is intoxicated and has a criminal record for committing a crime under Article 264.1 of the Russian Criminal Code.

The Court of Cassation did not agree with the verdict and pointed out that Chernykh's criminal record under the verdict of 03.07.2018 had been extinguished at the time of the new deed commission. This should exclude his criminal liability under Part 2 of Article 264.1 of the Russian Criminal Code, where the presence of a criminal record is a mandatory sign of a crime (Cassation Resolution of the General Jurisdiction Cassation Court No. 2 No. 77-1487/2024 dated 04.06.2024). The Cassation Court decision was based on paragraph 14 of the Resolution No. 14 of the Russian Supreme Court Plenum dated 07.06.2022 "On the practice of courts applying legislation regulating the calculation of the repayment period and the procedure for removing criminal records".

A similar example is criminal case No. 1-74/2024 (UID 50RS0036-01-2024-000324-74) in relation to a citizen Malofeev, considered by the Pushkin City Court of the Moscow Region on 12.02.2024 with a verdict of guilty, which was also overturned on cassation on a similar basis (Cassation Resolution of the General Jurisdiction Cassation Court No. 1 No. 77-1251/2025 dated 16.04.2025).

Thus, the short answer to the first problem will be as follows: there is no corpus delicti in Ivanov's actions, since the criminal record under the first sentence was extinguished on 13.05.2023.

Assessment criteria for the first problem are: the absence of corpus delicti is correctly determined and the correct justification is given by expunging the criminal record the next day after serving (executing) the additional sentence. If both criteria are met, the answer is assessed as 100%; if only one criterion is met, the answer is assessed as 50%.

The second problem is based on paragraph 5 of clause 27 of the Resolution of the Russian Supreme Court Plenum dated 29.11.2016 No. 55 "On the court verdict" (stating the need to determine the type of recidivism when assigning a type of correctional institution) and clause 52 of the Resolution of the Russian Supreme Court Plenum dated 22.12.2015 No. 58 "On the practice of assigning criminal punishment by the courts of the Russian Federation" (on applying general rules in the imposition of punishment for a set of crimes to a person who committed another crime before sentencing in the first case).

Based on this, the short answer to the second problem will be as follows: according to Article 70 of the Russian Criminal Code, the final punishment by the totality of sentences was assigned to Petrov incorrectly, since it was necessary to apply Part 5 of Article 69 of the Russian Criminal Code (the imposition of punishment by the totality of crimes). Dangerous recidivism was incorrectly determined, since at the time of the crime commission there was only one criminal record, forming a relapse. Hence, Petrov's actions are a simple recidivism.

Assessment criteria for the second problem are: the error in the application of Article 70 of the Russian Criminal Code and in determining the type of relapse was correctly identified. If both criteria are met, the answer is assessed as 100%; if only one criterion is met, the answer is assessed as 50%.

As one can see, the solution of the above problems generally depends on the exact definition of the rule to be applied (in the first problem – the rule for calculating the repayment period of a criminal record, in the second problem – the rule for sentencing with multiple crimes) and the correctness of calculations (in the first problem – determining the period of the additional punishment execution and the date of a criminal record repayment; in the second problem – determining the chronology of crimes and sentences). Thus, these problems are based on analyzing precisely defined parameters, and therefore require calculations and exclude the need to formulate evaluative judgments. The problem statements provide comprehensive information that allows one to give a complete and correct answer.

2. Description of the outcomes

2.1. Problem 1

None of the NNs gave a 100% correct answer (Table 1). The closest was Claude Sonnet 4.5, which pointed out that the deed cannot be qualified under Part 2 of Article 264.1 of the Russian Criminal Code, since the criminal record was expunged after the probation period. The assessment for this answer is 50%, because the repayment time of the criminal record was determined incorrectly. Other models did not cope with this problem. DeepSeek gave the least accurate answer, since, instead of expunging a criminal record, it provided judgments about the administrative punishment effect.

Table 1. Answers to Problem 1. Attempt 1

Model	Brief answer	Assessment (%)
Chat GPT 5	Ivanov's actions may be qualified under Part 2 of Article 264.1 of the Russian Criminal Code if the criminal record has not yet been expunged	0
Claude Sonnet 4.5	Qualification under Part 2 of Article 264.1 of the Russian Criminal Code is impossible, since the criminal record was expunged after the probation period	50
YaGPT	Ivanov's actions should be qualified under Part 2 of Article 264.1 of the Russian Criminal Code since the criminal record has not yet been expunged	0
Perplexity	Ivanov's actions should be qualified under Part 2 of Article 264.1 of the Russian Criminal Code since the criminal record has not yet been expunged	0
GigaChat	Ivanov's actions should be qualified under Part 2 of Article 264.1 of the Russian Criminal Code since the criminal record has not yet been expunged	0
DeepSeek	Ivanov's actions should be qualified under Part 2 of Article 264.1 of the Russian Criminal Code since he drove a vehicle in a state of alcohol intoxication during the administrative punishment in the form of deprivation of a special right	0

Apparently, the NNs failed to reach the text of the above-mentioned clause 14 of the Resolution of the Russian Supreme Court Plenum dated 06/07/2022 No. 14 "On the practice of courts applying legislation regulating the calculation of the repayment period and the procedure for removing criminal records". In this regard, a second attempt was made, during which each model was provided with an accurate quote of the said legal norm. The results changed (Table 2). On the second attempt, Claude Sonnet 4.5, YaGPT and ChatGPT gave a 100% correct answer. They correctly stated that there was no corpus delicti in Ivanov's actions due to the expungement of his conviction. At the same time, these models recognized the mistake in the first attempt and correctly applied the quote provided to them. Also, the first two models correctly determined the repayment date of the criminal record, and ChatGPT was mistaken in this, indicating a month earlier. This did not affect the answer correctness, so the result was accepted.

Table 2. Answers to Problem 1. Attempt 2

Model	Brief answer	Assessment (%)
Chat GPT 5	There is no corpus delicti in Ivanov's actions, as his previous conviction was expunged on 13.04.2023	100*
Claude Sonnet 4.5	Ivanov's actions at the time of his arrest on 01.06.2023 cannot be qualified as a crime, since 19 days passed since the expungement of his criminal record.	100
YaGPT	Ivanov's criminal record was expunged on 13.05.2023, and his actions, committed on 01.06.2023, cannot be qualified under Part 2 of Article 264.1 of the Russian Criminal Code due to the absence of an outstanding criminal record at the time of the act	100
Perplexity	Ivanov's criminal record will be considered expunged only on 13.05./2024, therefore, his actions should be qualified under Part 2 of art. 264.1 of the Russian Criminal Code	0
GigaChat	Ivanov remained convicted until 12.11.2023, therefore, his actions constitute a crime under Part 1 of art. 264.1 of the Russian Criminal Code	0
DeepSeek	On 01.06.2023, Ivanov's criminal record was expunged, the term of administrative punishment in the form of deprivation of the right expired, and his actions should be qualified under Part 2 of Article 264.1 of the Russian Criminal Code	0

Note: given the above commentary.

This time, the least accurate answer could not be determine, since the answers from Perplexity, GigaChat and DeepSeek were equally incorrect. It is only worth noting that the first two models continued to consider Ivanov to be convicted, that is, they ignored the quote of the legal position provided to them; DeepSeek misunderstood its content, considering that the criminal record repayment had no legal significance in answering the question.

2.2. Problem 2

The questions posed in the second problem did not cause difficulties for Claude Sonnet 4.5 and ChatGPT – these models gave 100% correct answers (Table 3).

Table 3. Answers to Problem 2

Model	Brief answer	Assessment (%)
Chat GPT 5	The final punishment was determined unlawfully, since the Court applied Article 70 of the Russian Criminal Code, although it should have applied Article 69 of the Russian Criminal Code: the crime was committed before the previous sentence was pronounced; dangerous recidivism was determined incorrectly, since Petrov had only one criminal record at the time of the crime	100
Claude Sonnet 4.5	The final punishment was imposed incorrectly, as the Court mistakenly applied Article 70 of the Russian Criminal Code (totality of sentences) instead of Article 69 of the Russian Criminal Code (totality of crimes). Establishing a dangerous recidivism is wrong. There is a simple recidivism in Petrov's actions	100
YaGPT	The final punishment was set correctly. A dangerous recidivism was set incorrectly, since Petrov had only one criminal record at the time of the crime, so there was no recidivism	0
Perplexity	The punishment was imposed correctly, and the recidivism was correctly established	0
GigaChat	The application of Article 70 of the Russian Criminal Code was legitimate, but the type of correctional institution was incorrectly defined. The recognition of a dangerous relapse was unjustified, since there is no relapse at all in Petrov's actions	0
DeepSeek	The final punishment was assigned incorrectly in terms of the type of correctional facility. The presence of a dangerous recidivism was incorrectly established, the recidivism should have been recognized as simple	50

Perplexity, YaGPT, DeepSeek and GigaChat did not see a mistake in applying the provisions of Article 70 of the Russian Criminal Code when imposing final punishment. At the same time, the last three models "doubted" the correctness of the relapse type, with YaGPT and GigaChat coming to the wrong conclusion about the absence of recidivism at all. DeepSeek was more accurate, indicating the presence of a simple recidivism, so its answer was assessed as 50% correct. Therefore, Perplexity gave the least accurate answer.

Thus, the most accurate answers to each problem were formulated by Claude Sonnet 4.5 (both problems were solved, all attempts were successful). The next most accurate was Chat GPT 5 (both problems were solved, but the first one with a reservation), followed by YaGPT (one problem was solved on the second attempt) and DeepSeek (the second problem was partially solved).

Since the problems were correctly solved by several NNs at once, the random nature of the results can be excluded. The reasoning of the answers provided by the models

also shows that they were obtained through computational processes, rather than random issuance. This demonstrates the real capabilities of the tested NNs, which directly correlate with the amount of data loaded into them and the settings of their computational algorithms.

Conclusions

The above test results make it possible to formulate the following conclusions:

1. Publicly available neural networks demonstrate a limited ability to solve formalized criminal law problems based on the analysis of strictly defined factual data and the application of unambiguous legal norms; however, this ability is unstable and varies significantly between models.

2. It was experimentally confirmed that the accuracy of neural network responses critically depends on the request structure and the direct provision of relevant legal sources. In the absence of such a source, the models are unable to independently identify relevant legal positions, including clarifications from the Russian Supreme Court Plenum; this fact demonstrates their reproductive rather than analytical-legal nature.

3. The use of neural networks is possible solely as an auxiliary tool for preliminary analysis, subject to mandatory subsequent legal verification of the outcomes, since the errors identified during our study exclude the possibility of their independent application in law enforcement activities.

References

Andrianov, A. A., Zaluzhnyy, A. A., Mitskevich, A. V., Ponomarev, A. V., & Ptitsyn, P. B. (2024). Prospects of artificial intelligence application in the nuclear industry. *Atomnaya Energiya*, *137*(5–6), 304–309. (In Russ.).

Avdoshin, S. M., Pesotskaya, E. Y., & Patrushev, K. A. (2024). Technologies of trusted artificial intelligence. *Information technologies*, *30*(8), 400–410. (In Russ.). https://doi.org/10.17587/it.30.400-410

Avetisyan, A. I. (2024). Artificial intelligence in the humanitarian field. Threats and opportunities. *Vestnik Rossijskoj Akademii Nauk*, *94*(7), 623–628. (In Russ.). https://doi.org/10.31857/S0869587324070028

Baryshnikov, P. N. (2022). Human and artificial intelligence systems. *Voprosy Filosofii*, *7*, 214–218. (In Russ.). https://doi.org/10.21146/0042-8744-2023-7-214-218

Belov, S., Zrelova, D., Zrelov, P., & Korenkov, V. (2020). Overview of methods for automatic natural language text processing. *Sistemny Analiz v Nauke i Obrazovanii*, *3*, 8–22. (In Russ.). https://doi.org/10.37005/2071-9612-2020-3-8-22

Berryman, J., & Ziegler, A. (2025). *Prompt Engineering for LLMs: The Art and Science of Building Large Language Model-Based Applications*. Astana: Sprint Buk. (In Russ.).

Betelin, V. B. (2024). Scientific problems of ensuring technological sovereignty in the field of artificial intelligence technologies. *Vestnik Rossijskoj Akademii Nauk*, *94*(7), 629–634. (In Russ.). https://doi.org/10.31857/S0869587324070031

Buzova, N. N. (2024). Is it possible to use artificial intelligence technology in judicial protection of copyright and related rights? *Rossijskoe Pravosudie*, *3*, 36–45. (In Russ.). https://doi.org/10.37399/issn2072-909X.2024.3.36-45

Callister, P. D. (2020). Law, Artificial Intelligence, and Natural Language Processing: A Funny Thing Happened on the Way to My Search Results. *Law Library Journal*, *112*(2), 161–212. https://doi.org/10.31228/osf.io/dw29y

Chebodaeva, V. A. (2023). Content generated by a neural network: who is to blame and what to do? *Journal of the Intellectual Property Rights Court*, *4*, 46–58. https://doi.org/10.58741/23134852_2023_4_5

Danielyan, A. S. (2024). Legal education and artificial intelligence: vectors of interaction. *Russian Journal of Economics and Law*, *18*(3), 804–823. (In Russ.). https://doi.org/10.21202/2782-2923.2024.3.804-823

Dedov, D. I. (2023). The right to a fair trial: new challenges and opportunities in the context of technologization of legal proceedings. *Journal of Foreign Legislation and Comparative Law*, *19*(1), 38–45. (In Russ.). https://doi.org/10.12737/jzsp.2023.005

Eremin, N. A., & Selenginsky, D. A. (2023). On the possibilities of applying artificial intelligence methods in solving oil and gas problems. *Izvestija Tulskogo Gosudarstvennogo Universiteta. Nauki o Zemle*, *1-1*, 201–211. (In Russ.). https://doi.org/10.46689/2218-5194-2023-1-1-201-211

Farinella, F., & Gulyaeva, E. E. (2024). Neurorights: Time to discuss rights to mental privacy and integrity. *Lex Genetica*, *3*(3), 44–61. https://doi.org/10.17803/lexgen-2024-3-3-44-61

Kalyatin, V. O. (2024). Is patent law ready for using artificial intelligence? Intellektualnaya sobstvennost. *Promyshlennaya sobstvennost*, *3*, 58–62. (In Russ.).

Karczkhiya, A. A. (2024). Legal protection of the achievements of artificial intelligence. Intellektualnaya sobstvennost. *Avtorskoe Pravo i Smezhnye Prava*, *4*, 4–16. (In Russ.).

Ke Wang (2023). On the Application of Artificial Intelligence in Local Legislation. *Applied Mathematics and Nonlinear Sciences*. https://doi.org/10.2478/amns.2023.1.00371

Kirpichev, A. E. (2024). Prompts for generative artificial intelligence in legal discourse. RUDN Journal of Law, 28(4), 906–918. (In Russ.). https://doi.org/10.22363/2313-2337-2024-28-4-906-918

Kobrinskii, B. A. (2024). Trust in artificial intelligence technologies. *Artificial Intelligence and Decision Making*, *3*, 3–17. (In Russ.). https://doi.org/10.14357/20718594240301

Kravchenko, O. V. (2025). Generative artificial intelligence: legal risks for business. *Yuridicheskaya Nauka*, *11*, 201–206. (In Russ.).

Kuzmenko, O. V. (2025). *Prompology: The Art of Dialoging with Neural Networks*. Moscow, Vologda: Infra-Inzheneriya. (In Russ.).

Navarro-Dolmestch, R., & Fuentes-Loureiro, M.-Á. (2023). Una aproximación a ChatGPT como herramienta jurídica: sesgos, capacidades y utilidades futuras. En: Miró, F. (coord.). *"Digitalización y algoritmización de la justicia". IDP. Revista de Internet, Derecho y Política, 39*. (In Spanish). https://doi.org/10.7238/idp.v0i39.417024

Oborotistov, N. Yu., & Muraev, A. A. (2023). Using artificial intelligence in dentistry. *Russian Journal of Stomatology*, *16*(4), 70–71. (In Russ.).

Orlov, Yu. N. (2025). Application of artificial intelligence methods in medicine. *Vestnik Rossijskoj Akademii Nauk*, *8*, 30–37. (In Russ.). https://doi.org/10.7868/S3034520025080032

Phoenix, J., Taylor, M. (2025). *Prompt Engineering for Generative AI: Future-Proof Inputs for Reliable AI Outputs*. Astana: Sprint Buk. (In Russ.).

Raikov, A. N. (2024). An optical computer for artificial general intelligence. *Information Society*, *2*, 11–19. (In Russ.). https://doi.org/10.52605/16059921_2024_02_11

Razumov, V. I., & Dus, Yu. P. (2024). New technologies of natural intelligence in reasoning automationtasks. *Tomsk State University Journal of Philosophy, Sociology And Political Science*, *77*, 53–61. (In Russ.). https://doi.org/10.17223/1998863X/77/4

Rimshin, V. I., & Kucherenko, V. A. (2024). Application of artificial intelligence in inspection of firings of buildings and structures. News of Higher Educational Institutions. *Construction*, *1*, 39–46. (In Russ.). https://doi.org/10.32683/0536-1052-2024-781-1-39-46

Sayfullin, A. A., Gabitov, A. A., Adeev, A. A., Salov, A. S., & Aspaev, N. A. (2023). Development of the application of artificial intelligence in computer technologies. *Pribory i Sistemy. Upravlenie, Kontrol, Diagnostika*, *1*, 15–22. (In Russ.). https://doi.org/10.25791/pribor.1.2023.1381

Sozaeva, D. A. (2024). Artificial intelligence technologies in standardization of procurement activities. *Standards and Quality*, *8*, 48–50. (In Russ.). https://doi.org/10.35400/0038-9692-2024-8-80-24

Vlasova, E. L. (2025). Artificial intelligence and legal discrimination. *Pravo i Gosudarstvo: Teoriya i Praktika*, *3*, 281–284. (In Russ.). https://doi.org/10.47643/1815-1337_2025_3_281

Vorozhevich, A. S. (2025). Do copyrights arise for works created with the help of artificial intelligence? Part II. *Patenty i Liczenzii. Intellektualnye Prava*, *3*, 28–37. (In Russ.).

Zharova, A. K. (2025). Dipfake technologies: socio-legal risks of violation of individual's privacy and legal solutions. *Legal Order: History, Theory, Practice, 2*, 63–68. (In Russ.). https://doi.org/10.47475/2311-696X-2025-45-2-63-68

Author information

Mikhail S. Spiridonov – Cand. Sci. (Law), Associate Professor, Department of Criminal Procedure, Criminology and Forensics, South Ural State University (National Research University)
Address: 76 prospekt Lenina, 454080 Chelyabinsk, Russia
E-mail: spiridonovms@susu.ru
ORCID ID: https://orcid.org/0009-0008-2715-8912
WoS Researcher ID: https://www.webofscience.com/wos/author/record/AAK-9097-2021
RSCI Author ID: https://elibrary.ru/author_items.asp?authorid=1089837

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Исследование возможностей применения общедоступных нейронных сетей в уголовном судопроизводстве

Михаил Сергеевич Спиридонов

Южно-Уральский государственный университет (национальный исследовательский университет), Челябинск, Россия

Ключевые слова

генеративный искусственный интеллект,
назначение наказания,
нейронные сети,
право,
правоприменение,
промпт,
уголовное право,
уголовное судопроизводство,
цифровые технологии,
юридический эксперимент

Аннотация

Цель: исследование направлено на экспериментальную проверку способности общедоступных нейронных сетей решать формализованные задачи уголовного права с заранее установленным нормативно корректным результатом.

Методы: для достижения поставленной цели применялся комплекс взаимодополняющих методов научного познания. Общенаучную основу исследования составили методы анализа и синтеза, индукции и дедукции, позволившие системно осмыслить изучаемую проблематику. В рамках специального юридического инструментария использовались формально-юридический анализ и официальное толкование норм права, что обеспечило строгость нормативной оценки полученных результатов. Ключевым эмпирическим методом исследования выступил контролируемый эксперимент, органично сочетавшийся с моделированием правоприменительных ситуаций и сравнительным анализом ответов шести общедоступных нейронных сетей на идентичные уголовно-правовые задачи.

Результаты: в ходе проведенного эксперимента установлено, что общедоступные нейронные сети обнаруживают существенные расхождения в точности и последовательности ответов при решении формализованных задач уголовного права: ни одна из тестируемых моделей не продемонстрировала стабильного и безошибочного результата. Выявлено, что в отсутствие прямого указания на соответствующие правовые источники модели систематически допускают ошибки при определении момента погашения судимости, применении правил назначения наказания и установлении вида рецидива преступлений, что свидетельствует об их репродуктивном, а не аналитико-правовом характере. Предоставление точных цитат из нормативных актов и разъяснений Пленума Верховного Суда Российской Федерации существенно повышает корректность ответов отдельных нейронных сетей. Определены наиболее и наименее результативные модели, а также

сформулированы основные требования к составлению юридически корректного запроса в сфере уголовного судопроизводства.

Научная новизна: настоящее исследование представляет собой попытку экспериментальной верификации возможностей общедоступных нейронных сетей применительно к конкретным задачам уголовного права с заранее известным нормативно верным ответом. Полученные результаты позволили выявить типологию воспроизводимых нейронными сетями ошибок, раскрыть их процессуальные причины, а также обозначить принципиальные ограничения использования генеративного искусственного интеллекта в правоприменительной деятельности.

Практическая значимость: результаты исследования могут использоваться в правоприменительной и образовательной деятельности: для определения допустимых границ применения общедоступных нейронных сетей в уголовном судопроизводстве, разработки методических рекомендаций по составлению юридически грамотных запросов к системам генеративного искусственного интеллекта, а также в целях предупреждения типовых ошибок при обращении к нейронным сетям в ходе профессиональной юридической деятельности.

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Спиридонов, М. С. (2026). Исследование возможностей применения общедоступных нейронных сетей в уголовном судопроизводстве. *Journal of Digital Technologies and Law*, *4*(1), 10–25. https://doi.org/10.21202/jdtl.2026.2

Список литературы

Авдошин, С. М., Песоцкая, Е. Ю., Патрушев, К. А. (2024). Технологии доверенного искусственного интеллекта. *Информационные технологии*, *30*(8), 400–410. EDN: https://elibrary.ru/MRRLBL. DOI: https://doi.org/10.17587/it.30.400-410

Аветисян, А. И. (2024). Искусственный интеллект в гуманитарной сфере. Угрозы и возможности. *Вестник Российской академии наук*, *94*(7), 623–628. EDN: https://elibrary.ru/FMXFED. DOI: https://doi.org/10.31857/S0869587324070028

Андрианов, А. А., Залужный, А. А., Мицкевич, А. В., Пономарев, А. В., Птицын, П. Б. (2024). Перспективы применения искусственного интеллекта в атомной отрасли. *Атомная энергия*, *137*(5–6), 304–309. EDN: https://elibrary.ru/XNBGZO

Барышников, П. Н. (2023). Человек и системы искусственного интеллекта. Санкт-Петербург: Юридический центр. *Вопросы философии*, *7*, 214–218. EDN: https://elibrary.ru/BXRFOF. DOI: https://doi.org/10.21146/0042-8744-2023-7-214-218

Белов С. Д., Зрелова Д. П., Зрелов П. В., Кореньков В. В. (2020). Обзор методов автоматической обработки текстов на естественном языке. *Системный анализ в науке и образовании: сетевое научное издание*, *3*, 8–22. EDN: https://elibrary.ru/YJFAYK. DOI: https://doi.org/10.37005/2071-9612-2020-3-8-22

Берриман, Дж., Циглер, А. (2025). *Промт-инжиниринг для LLM. Искусство построения приложений на основе больших языковых моделей*. Астана: Спринт Бук.

Бетелин, В. Б. (2024). Научные проблемы обеспечения технологического суверенитета в области технологий искусственного интеллекта. *Вестник Российской академии наук*, *94*(7), 629–634. EDN: https://elibrary.ru/FMSVIQ. DOI: https://doi.org/10.31857/S0869587324070031

Бузова, Н. В. (2024). Возможно ли применение технологии искусственного интеллекта при судебной защите авторских и смежных прав? *Российское правосудие*, 3, 36–45. EDN: https://elibrary.ru/DOURTE. DOI: https://doi.org/10.37399/issn2072-909X.2024.3.36-45

Власова, Е. Л. (2025). Искусственный интеллект и правовая дискриминация. *Право и государство: теория и практика*, *3*, 281–284. EDN: https://elibrary.ru/TZNYRI. DOI: https://doi.org/10.47643/1815-1337_2025_3_281

Ворожевич, А. С. (2025). Возникают ли авторские права на произведения, созданные при помощи искусственного интеллекта? Часть II. *Патенты и лицензии. Интеллектуальные права*, *3*, 28–37. https://elibrary.ru/CJHOOV

Даниелян, А. С. (2024). Юридическое образование и искусственный интеллект: векторы взаимодействия. *Russian Journal of Economics and Law*, *18*(3), 804–823. EDN: https://elibrary.ru/PWFHAU. DOI: https://doi.org/10.21202/2782-2923.2024.3.804-823

Дедов, Д. И. (2023). Право на справедливый суд: новые вызовы и возможности в условиях технологизации судопроизводства. *Журнал зарубежного законодательства и сравнительного правоведения*, *19*(1), 38–45. EDN: https://elibrary.ru/UGNHOB. DOI: https://doi.org/10.12737/jzsp.2023.005

Еремин, Н. А., Селенгинский, Д. А. (2023). О возможностях применения методов искусственного интеллекта в решении нефтегазовых задач. *Известия Тульского государственного университета. Науки о Земле*, *1-1*, 201–211. EDN: https://elibrary.ru/LGOGCA. DOI: https://doi.org/10.46689/2218-5194-2023-1-1-201-211

Жарова, А. К. (2025). Технологии дипфейк: социально-правовые риски нарушения частной жизни лица и правовые решения. *Правопорядок: история, теория, практика*, *2*, 63–68. EDN: https://elibrary.ru/NGILIG. DOI: https://doi.org/10.47475/2311-696X-2025-45-2-63-68

Калятин, В. О. (2024). Готово ли патентное законодательство к использованию искусственного интеллекта? *Интеллектуальная собственность. Промышленная собственность*, *3*, 58–62. EDN: https://elibrary.ru/AZDCNH

Карцхия, А. А. (2024). Правовая охрана достижений искусственного интеллекта. Интеллектуальная собственность. *Авторское право и смежные права*, *4*, 4–16. EDN: https://elibrary.ru/QKLHFK

Кирпичев, А. Е. (2024). Промпты (запросы) для генеративного искусственного интеллекта в юридическом дискурсе. *Вестник Российского университета дружбы народов. Серия: Юридические науки*, *28*(4), 906–918. EDN: https://elibrary.ru/ILOQXB. DOI: https://doi.org/10.22363/2313-2337-2024-28-4-906-918

Кобринский, Б. А. (2024). Доверие к технологиям искусственного интеллекта. *Искусственный интеллект и принятие решений*, *3*, 3–17. EDN: https://elibrary.ru/HHRFBG. DOI: https://doi.org/10.14357/20718594240301

Кравченко, О. В. (2025). Генеративный искусственный интеллект: правовые риски для бизнеса. *Юридическая* наука, *11*, 201–206. EDN: https://elibrary.ru/AFPVYE

Кузьменко, О. В. (2025). *Промптология. Искусство диалога с нейросетями*. Москва, Вологда: Инфра-Инженерия.

Оборотистов, Н. Ю., & Мураев, А. А. (2023). Применение искусственного интеллекта в стоматологии. *Российская стоматология*, *16*(4), 70–71. EDN: https://elibrary.ru/YQYOBK

Орлов, Ю. Н. (2025). Методы искусственного интеллекта в медицине. *Вестник Российской академии наук*, *8*, 30–37. EDN: https://elibrary.ru/DTDSKQ. DOI: https://doi.org/10.7868/S3034520025080032

Разумов, В. И., & Дусь, Ю. П. (2024). Новые технологии естественного интеллекта в задачах автоматизации рассуждений. *Вестник Томского государственного университета. Философия. Социология. Политология*, *77*, 53–61. EDN: https://elibrary.ru/TUWFQU. DOI: https://doi.org/10.17223/1998863X/77/4

Райков, А. Н. (2024). Оптический компьютер для искусственного общего интеллекта. *Информационное общество*, *2*, 11–19. EDN: https://elibrary.ru/YPLVLS. DOI: https://doi.org/10.52605/16059921_2024_02_11

Римшин, В. И., Кучеренко, В. А. (2024). Применение искусственного интеллекта при обследовании арматуры зданий и сооружений. *Известия высших учебных заведений. Строительство*, *1*, 39–46. EDN: https://elibrary.ru/EYDGRW. DOI: https://doi.org/10.32683/0536-1052-2024-781-1-39-46

Сайфуллин, А. А., Габитов, А. А., Адеев, А. А., Салов, А. С., Аспаев Н. А. (2023). Развитие применения искусственного интеллекта в компьютерных технологиях. *Приборы и системы. Управление, контроль, диагностика*, *1*, 15–22. EDN: https://elibrary.ru/ADUUBV. DOI: https://doi.org/10.25791/pribor.1.2023.1381

Созаева, Д. А. (2024). Технологии искусственного интеллекта в стандартизации закупочной деятельности. *Стандарты и качество*, *8*, 48–50. EDN: https://elibrary.ru/QWJYZQ. DOI: https://doi.org/10.35400/0038-9692-2024-8-80-24

Феникс, Дж., Тейлор, М. (2025). *Промт-инжиниринг для GenAI. Паттерны надежных запросов для качественных результатов*. Астана: Спринт Бук.

Чебодаева, В. А. (2023). Контент, сгенерированный нейросетью: кто виноват и что делать? *Журнал Суда по интеллектуальным правам*, *4*, 46–58. EDN: https://elibrary.ru/RDRUUP. DOI: https://doi.org/10.58741/23134852_2023_4_5

Callister, P. D. (2020). Law, Artificial Intelligence, and Natural Language Processing: A Funny Thing Happened on the Way to My Search Results. *Law Library Journal*, *112*(2), 161–212. https://doi.org/10.31228/osf.io/dw29y

Farinella, F., & Gulyaeva, E. E. (2024). Neurorights: Time to discuss rights to mental privacy and integrity. *Lex Genetica*, *3*(3), 44–61. EDN: https://elibrary.ru/DRMCLK. DOI: https://doi.org/10.17803/lexgen-2024-3-3-44-61

Ke Wang (2023). On the Application of Artificial Intelligence in Local Legislation. *Applied Mathematics and Nonlinear Sciences*. EDN: https://elibrary.ru/TEVDRM. DOI: https://doi.org/10.2478/amns.2023.1.00371

Navarro-Dolmestch, R., & Fuentes-Loureiro, M.-Á. (2023). Una aproximación a ChatGPT como herramienta jurídica: sesgos, capacidades y utilidades futuras. En: Miró, F. (coord.). "Digitalización y algoritmización de la justicia". *IDP. Revista de Internet, Derecho y Política*, *39*. (на испанском). EDN: https://elibrary.ru/NJVACG. DOI: https://doi.org/10.7238/idp.v0i39.417024

Сведения об авторе

Спиридонов Михаил Сергеевич – кандидат юридических наук, доцент кафедры уголовного процесса, криминалистики и судебной экспертизы, Южно-Уральский государственный университет (национальный исследовательский университет)
Адрес: 454080, Россия, Челябинск, проспект Ленина, 76
E-mail: spiridonovms@susu.ru
ORCID ID: https://orcid.org/0009-0008-2715-8912
WoS Researcher ID: https://www.webofscience.com/wos/author/record/AAK-9097-2021
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Digitalization of Justice in Zimbabwe: Institutional Challenges and Practical Solutions

Walter T. Chikwana

Judicial Service Commission of Zimbabwe, Harare, Zimbabwe

Keywords

access to justice,
cybersecurity,
digital literacy,
digital technologies,
electronic filing of documents,
electronic justice,
interagency cooperation,
judicial proceedings,
law,
virtual hearings

Abstract

Objective: to investigate the process of implementing an Integrated Electronic Case Management System in Zimbabwean judicial system; to describe key problems, results achieved and lessons learned in order to facilitate access to justice and overall effectiveness of judicial proceedings.

Methods: the research was carried out in the genre of applied doctrinal-legal analysis with a descriptive approach to the phased implementation of the Integrated Electronic Case Management System. The methods used included studying legislation, analyzing the technical architecture of the system, integrating stakeholders and operational impacts, as well as a systematic review of internal reports of the Judicial Service Commission (JSC) of Zimbabwe, support service query logs, user registration statistics and empirical observations of the implementation stages and the change management program.

Results: the introduction of the Integrated Electronic Case Management System automated the full cycle of the judicial process, from electronic filing of documents to the execution of decisions and appeals. It provided a noticeable increase in transparency and accountability through online case tracking and audit logs. Case review rates in higher instances increased, while accumulation of cases significantly decreased. Online registration mechanisms, virtual hearings, electronic signatures and online payments were introduced. At the same time, systemic obstacles were identified – unstable electricity supply, limited Internet access in remote areas, a shortage of devices, a low level of digital literacy, language barriers, and concerns about cybersecurity.

Scientific novelty: the article presents a comprehensive empirical analysis of the nation-wide digitalization of judicial proceedings in Zimbabwe, which

demonstrates the relationship between technological transformations and institutional parameters of independence, accountability, and access to justice. The author substantiated the role of a phased strategy and change management programs as conditions for sustainable digital transformation of the judicial system.

Practical significance: the results provide practical recommendations for court administrators and policy makers: preference for phased implementation; strengthening infrastructure support and electronic registration centers; large-scale training programs; strengthening cybersecurity and harmonizing legislation to ensure inclusive, reliable and sustainable development of electronic justice.

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Contents

Introduction

The Judiciary in Zimbabwe embarked on a metamorphic process to digitise the courts. 1 May 2022[1] with the introduction of a digital platform which allowed for the filing of all manner of court processes or pleadings as well as the hearing of matters electronically. The system leverages technology to enhance judicial administration generally and the management of the courts in particular. When fully operational it entails the total discontinuation of paper-based pleadings and obviates the need for litigants and legal practitioners to physically appear in court to argue their cases. That digitisation is enabled by a computerised court and case management software called the Integrated Electronic Case Management System (hereinafter IECMS). The IECMS integrates all courts under one system by automating the entire lifecycle of a case from the initial filing, to its disposition, execution of judgment and the subsequent appeal processes. At its full implementation, it is also intended to fully integrate the courts with other justice sector stakeholders, such as the National Prosecuting Authority of Zimbabwe (NPA), the Zimbabwe Republic Police (ZRP), the Zimbabwe Anti-Corruption Commission (ZACC), the Law Society of Zimbabwe (LSZ), and the Zimbabwe Prisons and Correctional Services (ZPCS). After full integration, all those stakeholders will be able to directly interact with courts online via the IECMS. The integration process must therefore be understood in two senses. First, it is between and amongst the entirety of the courts and the users and litigants who come before them. Second, it is an integration between and amongst the courts and stakeholders in the justice sector.

The IECMS represents a complete shift in the direction in which the courts in Zimbabwe were hitherto run. It typifies the abandonment of the traditional paper-based processes and the advent of a streamlined, digital framework. At its core, the IECMS is a comprehensive web-based application, inherently reliant on robust and ubiquitous internet connectivity. That fundamental dependency on connectivity cuts across the entire judicial ecosystem, from the centralised data centre where the system's vital components are hosted to every court station where judicial staff, legal professionals, and the public interact with it daily (Gómez, 2024; Helberger & Felzmann, 2025; Maroz, 2023; Sourdin & Weller, 2025; Grudtsina, 2025; Luo, 2024; Stepanov et al., 2021; Wang & Chen, 2022; Boldyrev & Maksimov, 2025; Alekseevskaya, 2020).

The paper explores Zimbabwe's experience in implementing the IECMS. It draws insights from the challenges and successes encountered during the process. The digitisation initiative was driven by inefficiencies in the manual, paper-based case management systems, which had resulted in document losses, delays in finalisation of cases, limited access to justice and complaints of corruption generally associated with human-driven processes.

[1] This was the same day the Judiciary saw the establishment of the first paperless court in the form of the stand-alone Commercial Division of the High Court. See remarks by Chief Justice Luke Malaba on the occasion of the opening of the 2023 legal year on 9 January, at p9 of the speech.

The paper equally highlights the role of judicial digitisation in promoting judicial accountability, transparency, independence, efficiency, and access to justice, all of which are at the core of principles guiding the judiciary and the JSC in Zimbabwe[2]. The digitisation, mechanisms such as online case tracking and performance monitoring have enhanced transparency by ensuring that judicial officers remain answerable to constitutional and legal standards while maintaining their judicial autonomy. Digitisation eradicated bureaucratic inefficiencies by enabling precise monitoring of judicial officers' workloads and performances. For instance, the progression of cases can now be tracked online by judicial officers, court staff, and litigants. Heads of courts and court managers can also monitor case backlogs and performances of judicial officers and other members of the judicial service without the need to physically visit the court stations. Instead, they rely on the court monitoring tools which are in-built in the IECMS. The transparency which results from the system fosters public trust in the judiciary, because of the enhanced access to case statuses and progress (Gafar, 2024; Reiling & Contini, 2022). In addition, the introduction of virtual hearings, e-filing, online payments, e-signatures and e-stamping has further improved processes turnaround times and made the Zimbabwean judicial system more user-friendly and accessible.

The paper also traverses the connection between judicial digitisation and judicial independence. Digitisation contributes to judicial independence by reducing reliance on manual processes and paperwork. In the process, the external pressures that are traditionally attendant and may serve to influence court operations are limited. Equally, judicial officers benefit from better workload management which allows them more time to focus on delivering informed and better reasoned decisions.

The paper underscores the importance of aligning technological advancements with public needs to ensure streamlined processes and improved access to justice. The public awareness campaigns, training programmes, and technical support mechanisms, such as e-filing centres, IECMS help desks, and 24/7 call centres, were critical in driving the adoption of the IECMS and ensuring a smooth transition. The phased implementation approach, where implementation started from the apex courts such as the Constitutional Court and Supreme Court before gradually moving down to the Magistrates' Courts, allowed for iterative improvements which in turn fed into user confidence-building.

Finally, the writer fully acknowledges the contributions previously made by other writers in critiquing the Zimbabwe IECMS implementation matrix. Those contributions stirred an interesting discourse on the trajectory adopted by the judiciary of Zimbabwe thus far. It is hoped that this paper will play its small part in the development and improvement of the body of knowledge around the digitisation of the courts in Zimbabwe.

[2] See sections 165 and 190 of the Constitution of Zimbabwe.

1. Methodology

This paper is grounded in applied legal research, undertaken for a practical purpose, namely to support and strengthen the ongoing digitisation of court administration in Zimbabwe (Chynoweth, 2008)[3]. In line with applied legal research that is produced with a particular purpose in mind, the analysis is directed at identifying implementable lessons that can facilitate improvements in the administration of justice through the IECMS rollout.

Methodologically, the paper employs applied doctrinal legal research by analysing the legal and institutional framework relevant to court administration and the digitisation of judicial processes. Doctrinal legal research formulates legal understanding through analysis of legal rules found in statutes and cases and is often described as black-letter law. The paper also relies on desk-based documentary analysis of available rollout materials and implementation information reflected in the phased account set out in the paper, consistent with legal research that is commonly conducted through reading and analysing published sources to develop an argument.

2. Evolution of the judiciary: from paper-based court procedures to digitization

Prior to the introduction of IECMS in the courts, the judicial system in Zimbabwe operated under a manual, paper-based case management framework, which limited accountability, efficiency, and accessibility. Court users and litigants were required to file all documents physically and to attend hearings in person. The service of court processes and pleadings was not spared. It could only be done physically. The payment of court and other user fees was limited to cash transactions at court registries. That manual system resulted in numerous inefficiencies, bottlenecks and at times in outright deliberate manipulation of court processes. Critical court documents and often times, entire case files were lost or stolen. Stories of pleadings and other court documents having been fraudulently back-date-stamped were not uncommon giving an unfair if not illegal advantage to litigants guilty of tardiness in defending claims against them. The tracking of cases was disjointed, access to information was difficult, and accountability mechanisms were weak. There was no centralised system to monitor the progress of cases, which led to huge backlogs, inconsistencies in court processes, and general poor monitoring of court performances and reporting. Whilst the judiciary in Zimbabwe was stagnant and became saddled with al these man-made challenges, other countries were taking steps to mitigate them or had already ridden the crest of that wave.

The last straw which spelt the doom of the manual systems came unexpectedly with the outbreak of the COVID-19 pandemic at the end of 2019. The situation rapidly

[3] Assim, L. (2015). An overview of research design and methodology. ERS Consultants CC.

deteriorated and by the beginning of 2020, practically all courthouses in the country were closed for long spells. The Government in compliance with the World Health Organisation recommendations imposed strict curfews often supervised by the security forces. There were severe restrictions on human movement[4]. As a result, court attendances by both court staff and members of the public became impossible. Routine court operations were suspended for extended periods. Legal practitioners were unable to operate, persons remanded in custody for criminal violations could not be brought to court, and the general public was effectively denied access to the courts. The consequences of the COVID-19 restrictions included an increase in court backlogs and significant difficulties in accessing the courts. Needless to say, the suspension of court proceedings did not halt the emergence of legal disputes, thus resulting in an untenable situation where the judiciary could not perform its constitutional mandate of dispensing justice. It impacted on the rule of law. While the COVID-19 pandemic exposed the fragilities of the justice delivery system, in Zimbabwe, it also became an opportunity for the JSC to innovate new justice delivery methods, such as the virtual court platforms, which are part of the core features of the IECMS[5].

The glaring limitations prompted the judiciary to accelerate its long-standing ambition to digitise court operations[6]. It increasingly became inevitable that the only way the integrity of the courts and the administration of justice could be preserved was to digitise the courts and enable court processes to be undertaken from anywhere. The Chief Justice of Zimbabwe, the Honourable Mr Justice L. Malaba graphically captured the scenario when he commented as follows:

"The impact of the COVID-19 pandemic, though traumatic and harrowing in many respects, has revealed a certain truth about the use of technology. Various professionals have now embraced digitisation in their day-to-day activities…The Judiciary appears to have been slow in adopting electronic justice, as it has found comfort in traditional ways of doing things, such as reliance on hard copies of books, allowing physical appearance in courts, and filing of physical documents. The Judiciary is doing this at its own peril, as the use of information communication technology has increasingly become the normal way of doing any business, including the business of delivering justice…The problems presented to the Judiciary by the nature and gravity of the impact on the justice delivery system by the consequences of the lockdown and restrictive

4 See, for example, the Public Health (COVID-19 Prevention and Containment) Regulations, 2020 [SI 77 of 2020].

5 Sibanda, A. (2022). Zim moves closer to virtual courts. https://goo.su/c9glXX

6 During the 2021 Legal Year Opening ceremony in Zimbabwe, the observation was made that, "It became apparent to the JSC that, in the midst of the raging pandemic, Information Communication Technologies ("ICT") had evolved from being an option to an absolute necessity. Courts could not afford to lag behind in harnessing the potential of ICT in ensuring that access to justice is not disrupted". See The Honourable Mr Justice L. Malaba, 2021 Legal Year Opening Speech: Ensuring Efficiency and Effectiveness of the Judiciary (Harare: Judicial Service Commission of Zimbabwe, 2021) at p. 21.

measures put in place by Government to prevent and contain the spread of COVID-19 are enough justification for the reform of the justice system"[7].

Notably, the decision to digitise the court system in Zimbabwe was also grounded in the Constitution of Zimbabwe, 2013 ("the Constitution"). Section 190(2) of the Constitution mandates the JSC to promote the efficient, effective, and transparent administration of justice[8]. Against the backdrop of inefficiencies caused by the paper-based case management system, the JSC was legally obligated to correct the issues which militated against the efficient administration of justice in the country by adopting strategies aimed at enhancing the efficiency of the courts. It was on that basis that the IECMS was formulated and designed by the judiciary as a tool to further its mandate in terms of section 190(2).

In addition, section 165 of the Constitution outlines the foundational principles which are supposed to guide the Judiciary of Zimbabwe. They include judicial impartiality, the imperative to perform judicial duties efficiently and with reasonable promptness, and the requirement for members of the judiciary, individually and collectively, to respect and honour their judicial office as a public trust and to strive to enhance their independence to maintain public confidence in the judicial system[9]. In keeping with section 165, digitisation of the courts aligns with those principles. A system which requires litigants to physically file processes at court stations which are often situated long distances from where the litigants live can never by any yardstick allow the dispensation of justice efficiently and with reasonable promptness. Instead, the introduction of virtual hearings as a component of digitisation made it possible for judicial officers, legal practitioners, and litigants to participate in proceedings remotely. That facilitates the performance of judicial duties efficiently and with reasonable promptness, among other outcomes.

The Declaration of Rights in the Constitution also presents a separate constitutional basis for the digitisation of the courts. Section 69(3) of the Constitution guarantees every person the right to access the courts, or some other tribunal or forum established by law for the resolution of any dispute. Access to the courts, which is usually mistaken for procedural rights of access far transcends that narrow conception. Rather, it is intrinsically linked to the principle of fairness in the treatment of all persons, guaranteeing the protection of their human dignity through the dispensation of justice by the courts[10].

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7 Address by the Hon Mr. Justice Luke Malaba, Chief Justice of Zimbabwe, on the occasion of the official opening of the 2022 legal year on 10 January 2022, with the theme, 'Use of Technology to enhance efficiency and the rule of law in the Judiciary'.

8 The Judicial Service Commission (JSC) is a constitutional body established in terms of section 189 of the Constitution of Zimbabwe, 2013. Its primary administrative mandate, as provided in section 190 of the Constitution, is to promote and facilitate the independence and accountability of the judiciary and maintain the administration of justice in Zimbabwe in a high state of effectiveness, efficiency, and transparency.

9 See subsections (1) and (2) of section 165 of the Constitution of Zimbabwe, 2013.

10 See Museredza and Others v Minister of Agriculture, Lands, Water and Rural Settlement and Others. CCZ-1-22 at p. 11, para. 23.

There is little doubt if any therefore, that the full realisation of the constitutional right to access the courts anticipates unhindered access to the courts. In that regard, digitisation breaks down physical and economic barriers to access the courts, including the requirement for litigants to travel long distances to file processes or argue their cases at the nearest court stations. It follows, therefore, that the computerisation of the courts is further informed by broader principles of access to the courts, fairness and equity, which encompass the need to prioritise citizens' needs for justice delivery over institutional convenience, the pursuit of both procedural and substantive justice, the suitability of technology in ensuring access to the courts, judicial efficiency and ensuring equal treatment[11], especially for economically disadvantaged litigants.

In light of the constitutional foundations outlined above, the digitisation of the court system in Zimbabwe is appropriately recognised as a necessary and unavoidable development. Although prior to 2017, there had been efforts to integrate other forms of computer systems into court operations, what is noteworthy is that such efforts only involved the scanning of court records to enhance accessibility and to create some semblance of backup and traceability. The conceptualisation of full digitisation started in June 2017[12]. It was at that time, that a committee chaired by a Judge of the High Court of Zimbabwe was appointed to explore and recommend the feasibility of establishing an Integrated Electronic Case Management System (IECMS)[13]. The committee comprised various stakeholders, who included other judges, the Head of Information and Technology of the JSC, the Chief Registrar of the Superior Courts, and the Registrars of the High Court and the Labour Court. The team benchmarked the initiative against systems in other countries and conducted a baseline study to assess what would be required, given the limitations of the existing case management system. Following that assessment, a recommendation was made confirming that the implementation of an electronic case management system was indeed feasible[14].

Consistent with the adoption of the recommendations made by the aforementioned Committee, an implementation committee was later established to oversee the system design[15]. It carried out a system requirements analysis, a needs assessment, a system specification and selection, as well as the procurement of the system developer. Synergy International Systems, Inc. was subsequently selected as the developer[16].

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11 Section 56 of the Constitution of Zimbabwe, 2013 guarantees every person the right to equality before the law and equal treatment and benefit of the law.

12 The Honourable Mr Justice L. Malaba, Remarks to Thank the Committee Appointed to Recommend an Appropriate Integrated Electronic Case Management System for Zimbabwean Courts (Harare: Judicial Service Commission, 19 November 2018) at p. 2.

13 The Chairperson of the committee was the Hon Justice Dr E Tsanga, a judge of the High Court.

14 The Justice Dr E Tsanga report was presented to the JSC by the committee on 19 November 2018.

15 The committee was led by the Senior Judge of the commercial division of the High Court, the Hon Mr Justice J Mafusire.

16 This is a Global Software Developing company, headquartered in Viginia USA, with regional offices in Netherlands and Rwanda and a development and learning Centre in Armenia.

According to Muserere and Watson:

"The IECMS software vendor, Synergy International Systems, Inc., was selected because of the flexibility of their e-Case platform and the company's extensive regional experience, including national-level systems in Rwanda and Uganda. This experience included the critical best practices and lessons learned from rolling out similar systems in both countries, which were eagerly applied by the JSC"[17].

After rigorous processes of system development, trials, testing, and the procurement of both software and hardware requirements, the IECMS, was ready for launch in 2022. It was designed to integrate the Constitutional Court, Supreme Court, Commercial Division of the High Court, the General Division of the High Court, Labour Court, Administrative Court, Magistrates' Court, and the Office of the Sheriff for Zimbabwe under a single IT framework[18]. The system also has the capacity to integrate other justice sector players into the court system. It automates and tracks all aspects of a case's life cycle, from initial filing of the case through to its disposition. It also covers post-disposition processes such as execution, appeals and reviews. Accordingly, the IECMS, as a digital tool, reimagined the courtroom not just as a physical space, but also as a dynamic platform for both virtual and physical hearings.

2.1. Legislative framework and regulatory alignment

The successful implementation of the IECMS inevitably required comprehensive amendments to existing statutes and court rules to provide a legal foundation on which the adoption of the electronic procedures could ride. It is in that respect that a legislative evolution has been systematically undertaken over the years. Those legislative amendments in many ways, mirrored the phased approach[19] to implementation whilst also ensuring that legal frameworks remained synchronised with technological capabilities.

2022: Legislative Developments. The initial IECMS deployment required amendments to the rules governing the affected courts to accommodate the electronic procedures which were alien under the physical regime. Resultantly, the amended Constitutional Court Rules were published[20], followed by the Supreme Court Rules and High Court (Commercial Division) Rules[21]. Those amendments established the legal basis for electronic filing, service of processes, and case management in the respective courts.

2023: Legislative enactments. The expansion of the IECMS to cover more courts, required corresponding legislative amendments to align court practices and procedures

17 Muserere, S. & Watson, A. (2023). Best practices and approaches to judicial digital transformation: Zimbabwe IECMS case study. The Court Administrator, 15 (Fall 2023). At p. 11.

18 Ibid.

19 The phased-out approach will be discussed in greater detail later in this paper.

20 Statutory Instrument No 8 of 2022.

21 This was done under Statutory Instruments 79 and 80 of 2022.

in those courts with system capabilities. The High Court Rules 2021, the Labour Court Rules and the Administrative Court Rules (Miscellaneous Appeals) were enacted through various statutory instruments[22].

Most significantly, the Judicial Laws Amendment Act 2023[23] was enacted to comprehensively amend multiple statutes, which deal with the administration of justice. The amended statutes included the Constitutional Court Act, Supreme Court Act, High Court Act, Administrative Court Act, Labour Court Act, Magistrates Court Act, and the Criminal Procedure and Evidence Act. The amendments introduced virtual court sittings and provided the legislative foundation essential for full IECMS utilisation and implementation.

2024: Regulatory Refinements. During the implementation of the system in the High Court General Division, the legislature raised concern that the High Court (Amendment) Rules 2023 (No. 1), did not sufficiently support access to justice objectives. Significantly, the Parliamentary Legal Committee issued an adverse report on the High Court (Amendment) Rules 2023 No 1[24]. The report noted that the requirement for electronic filing of pleadings and notices was problematic given that large segments of the population in rural areas lacked reliable internet connectivity[25]. It also noted that not everyone had electronic devices which would enable them to access the IECMS. The Committee's report argued that online hearings undermined the public hearing component of court proceedings by limiting public participation. Concern was also raised that the English-only instructions on the IECMS created language barriers. The further contention was made that, because the country's power supply was erratic with long hours of load shedding experienced countrywide, yet the system heavily relied on uninterrupted power supply, its efficacy would be minimal. As a result, Parliament requested the JSC to revise the rules. The JSC agreed and the earlier rules were consequently repealed and replaced by new ones, in the form of the High Court (Amendment) Rules 2024 (No. 2), gazetted on 8 May 2024[26]. The new rules explicitly integrated the concepts of IECMS accounts and the IECMS platform into the High Court Rules, 2021, effectively putting in place clear legal authority for electronic filing, service, and virtual hearings and addressing the concerns raised by the legislature.

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22 High Court (Amendment) Rules 2023, under Statutory Instrument No 153 of 2023 and Statutory Instrument No 2 of 2023 respectively.

23 Act No 5 of 2023.

24 In terms of section 152 of the Constitution of Zimbabwe, 2013, the Parliamentary Legal Committee is responsible for examining all Bills, except Constitutional Bills, statutory instruments and draft legislation referred to it. Its function is to assess whether any provision in such legislation contravenes the Constitution or exceeds the authority granted by the enabling Act, and to report its findings to Parliament or the relevant authorities.

25 Parliamentary Legal Committee. Adverse Report of the Parliamentary Legal Committee on Statutory Instrument 153 of 2023, High Court (Amendment) Rules, 2023 (No. 1) (Harare: Parliament of Zimbabwe, 2023). https://clck.ru/3SKsqz

26 Statutory Instrument 81 of 2024.

2025: Magistrates' Court Alignment. In preparation for the implementation of phase 4 deployment of the IECMS in Magistrates' Courts, the Magistrates' Court (Civil) Amendment Rules were promulgated[27]. The amendments aligned the Magistrates Court Rules 2018 with key IECMS features, ensuring that the lower courts possessed the same electronic capabilities and legal framework as the Superior Courts, thereby promoting consistency across the judicial system.

2.2. The launch of the IECMS

As already stated, the IECMS overhauled the paper-based case management system and replaced it with a paperless electronic case management system.

Earlier, it was pointed out that the introduction of the IECMS is centred on the constitutional obligation of the JSC to ensure the proper, efficient, effective, and transparent administration of justice, as well as the duty of the State to ensure the realisation of citizens' right to access the courts. The constitutional grounds for the adoption of the IECMS as a tool for efficiency in the administration of justice achieve several allied objectives, including to enhance the operational efficiency of the courts in Zimbabwe, reduce the costs of and delays in litigation, improve access to justice, and promoting transparency, integrity, and accountability in the administration of justice.

2.2.1. The Phased Implementation of IECMS

The JSC deliberately decided against an omnibus approach in rolling out the IECMS. Instead, the implentation is being done in four phases. The staggered implementation is a strategy designed to gradually roll out a new system in stages rather than in one fell swoop. It is intended to reduce risk and to allow for better change management[28]. Each phase introduces a specific set of features or serves a particular part of the court system, providing time for adaptation, troubleshooting, and integration of feedback before moving to the next step. Phased implementation works through a series of distinct and planned stages, which are incremental in that they introduce new components gradually over time, allowing different user groups to adopt the new system at different times while supporting the old system until the new one is fully operational[29].

The phased implementation matrix adopted by the JSC is informed by various realities. The approach was adopted to support the gradual uptake of the system by the courts and all stakeholders, while allowing the JSC the opportunity to observe how the IECMS functions and assess both the system's strengths and limitations. It also provided the space for resource mobilisation to allow the putting together of both material and

27 Statutory Instrument No 52 of 2025.

28 Phased Implementation: A Better Way to Onboard SaaS Clients. (2025, March 28). Dock. https://clck.ru/3SKsvz

29 Understanding Implementation Strategies in the Software Development Life Cycle (SDLC). (2024, October 27). Business Analysis Coach. https://clck.ru/3SKtFo

human resources for each phase[30]. The incremental approach further allowed adequate training to be conducted for all role players in the IECMS, such as members of support staff, judicial officers, other stakeholders like the police, prosecutors, legal practitioners, and members of the public. It further presented time and opportunity to carry out massive publicity campaigns as part of the change management programme to ensure that all stakeholders, members of the Judicial Service, and the public at large had a clear understanding of what IECMS was all about and to appreciate the benefits drawn therefrom. Notably, before the official launch of the first phase, the JSC had already piloted virtual court hearings connecting the courts and inmates at prisons, laying the groundwork for the IECMS implementation. The virtual court hearings were launched at the Harare Magistrates' Court, the Harare Remand Prisons, Chikurubi Maximum Security Prison, and the Harare High Court in February 2022[31]. The arrangement facilitated the speedy hearing of urgent and routine cases in criminal matters, including remands and bail applications, for persons in custody. That initiative resulted in huge savings to the Zimbabwe Prisons and Correctional Services when it shed off the unnecessary expenses for transport and kindred obligations which came with ferrying prisoners to and from the courts daily. More importantly, the strategy also served as a precursor to the IECMS implementation dynamics and functionalities.

In some jurisdictions, as noted by Djuraev et al. (2025), the phased approach was mainly informed by the geographical locations[32], where the authorities decided to start with cities and other urban areas and then moving to the countryside, in Zimbabwe the approach was based on the hierarchy of the courts and their workloads. The JSC saw it prudent to start with less busy courts and gradually moving to those with punishing workloads. The implication of that approach is therefore that at each and every one of the four phases of the implementation matrix, the IECMS was introduced in every part of the country, but with particular focus on a certain court or courts. The first phase of the IECMS roll-out on 1 May 2022, saw the deployment of the IECMS in the Constitutional Court, the Supreme Court, and the Commercial Division of the High Court. On 1 February 2023, the second phase was launched in the Labour Court and the Administrative Court. The third phase was launched on 1 September 2023 in the General Division of the High Court as well as the Office of the Sheriff of Zimbabwe. The fourth and final phase, which is ongoing, commenced on 1 July 2025 and involves the deployment of the IECMS in the Magistrates' Courts.

30 The procurement and funding for the whole IECMS implementation process have been funded by the Government of Zimbabwe through the Ministry of Finance and Economic Development.

31 The prison to court virtual court project was carried out by JSC in partnership with the United Nations Development Projects (UNDP).

32 See comments by Djuraev et al. (2025). They commented that in South Africa urban areas have benefitted from its Integrated Justice System (IJS) and the rurtal areas still rely on manual processes as there are no data centres in the rural areas. The same comments were also expressed in regards to Kenya digitization process by Krupina et al. (2020).

A phased-out approach has also been adopted for the fourth phase of implementation, in that the system is introduced in the Magistrates' Courts in two provinces at a time. What is unique about the fourth phase is that, the implementation matrix has shifted from court by court to geographical areas. The Magistrates' Courts are not only the busiest courts in Zimbabwe[33] but are also the most widespread. They are located in all provinces and districts of the country. They mostly serve the indigent and the vulnerable who can barely afford the cost of litigation. It was therefore important that a carefully planned implementation methodology be adopted to cater for the unique needs of the persons who frequently use those courts[34]. The preparations for the launch of the fourth phase commenced on 1 January 2025[35]. Fig. 1 illustrates the phased implementation of the IECMS across court levels, as explained above, culminating in the province-based approach adopted for Magistrates' Courts in phase four. The approach was designed to manage scalability and maintain continuity during implementation.

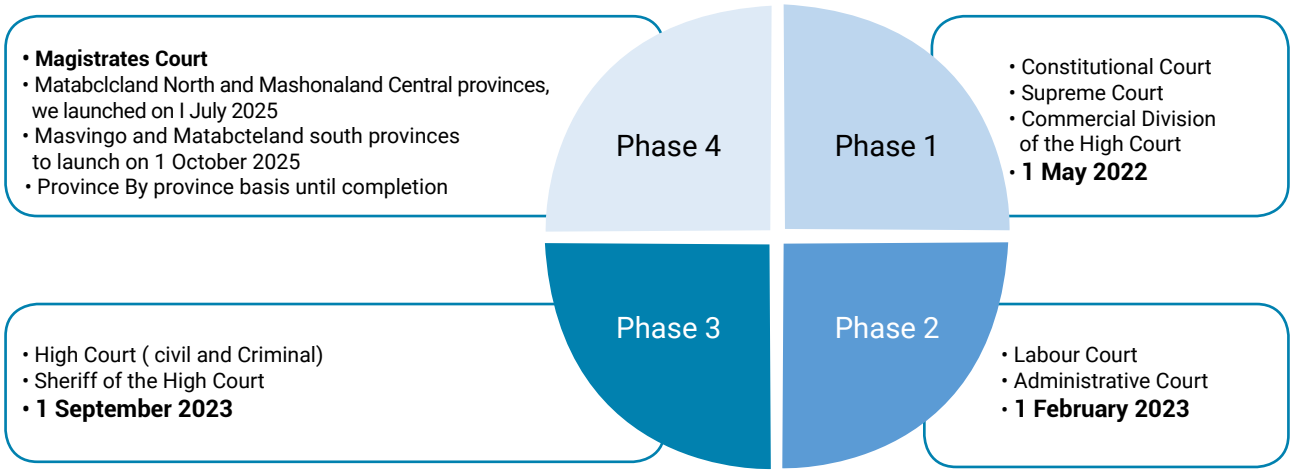

Fig. 1. The phased approach in the implementation of IECMS

2.2.2. The IECMS Architecture

The IECMS contains several key functionalities, which include e-filing, e-payments, e-calendars, virtual hearings, automated case tracking and notifications, electronic access to court records and judgments, and use of e-signatures and e-stamping, amongst others. Fig. 2 summarises the IECMS, showing its scope and the courts it integrates and

33 92 558 criminal cases and 121 503 civil cases were completed in 2024. See JSC Annual Report 2024, at pp. 33–34.

34 At the time of writing this paper, phase 4.1 for Matabeleland North and Mashonaland Central Provinces and phase 4.2 for Masvingo and Matabeleland South provinces had been implemented on 1st of July and 1st October 2025, respectively.

35 Madzianike, N. (2025, June 4). Magistrates Court to go digital starting July. The Herald. https://goo.su/b32tiR

highlighting that the IECMS is a web-based case management platform designed to track the full life cycle of a case and to integrate court processes across the judiciary.

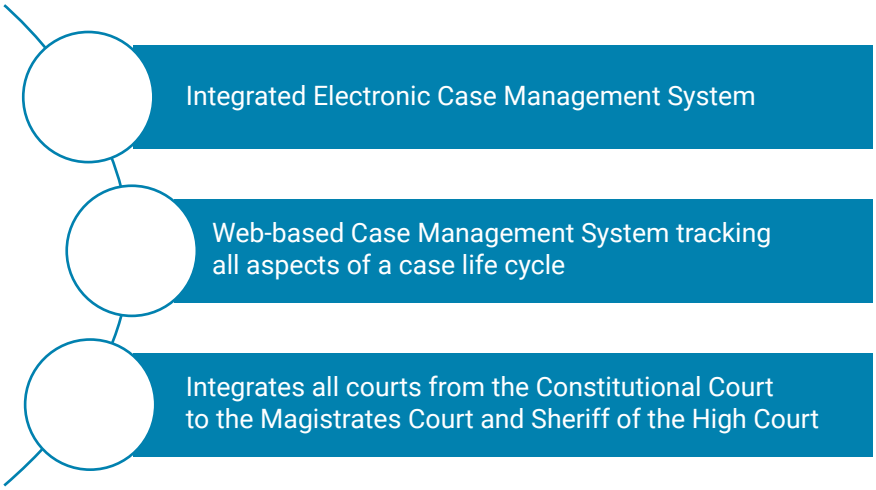

Fig. 2. Life cycle of cases and integration of court processes

The discussion that follows explains its core features, beginning with e-filing.

1. E-Filing.

The feature allows litigants to create and submit their cases, pleadings, affidavits, letters, and miscellaneous documents to the courts via the system. Through this feature, litigants and legal practitioners can initiate and respond to cases electronically by submitting and receiving documents via their online portals. The feature eliminates the need to physically visit the court registry. In filing a new case in IECMS, the litigants must specify:

i) the Court Level, the Court, the Court Registry in which they want to file their case;

ii) the category of the case that they want to file, and;

iii) the cause of action, or the charge in criminal cases.

Other sections that they will complete include the case parties, case legal practitioners, and case documents.

2. Case tracking.

The system facilitates automated case tracking by assigning case numbers to all cases filed while issuing real-time notifications for scheduled hearings, deadlines and court orders, and judgments. That function allows litigants to monitor the progress of their cases online. Relatedly, access to court records and judgments is streamlined. In this regard, parties and their legal representatives can retrieve case files, records of proceedings, orders, and judgments directly. The feature promotes transparency by negating the need for access through court staff or intermediaries.

Every case has its prescribed stages, which it must pass through as guided by the court rules. All these stages are captured by the system, and the progress is displayed on what is called a subway map. That map comprises nodes and a horizontal bar. A node (circle) represents the state of the case, or a distinct stage in a case's life cycle, a horizontal bar

between two nodes depicts progress, or transitioning of a case from one stage to the next in its life cycle. The last node, which is also the biggest, shows the case's current status, state, or stage in the case's life cycle. For sake of brevity, Figure 3 provides an illustrative screenshot of a subway map generated from the system.

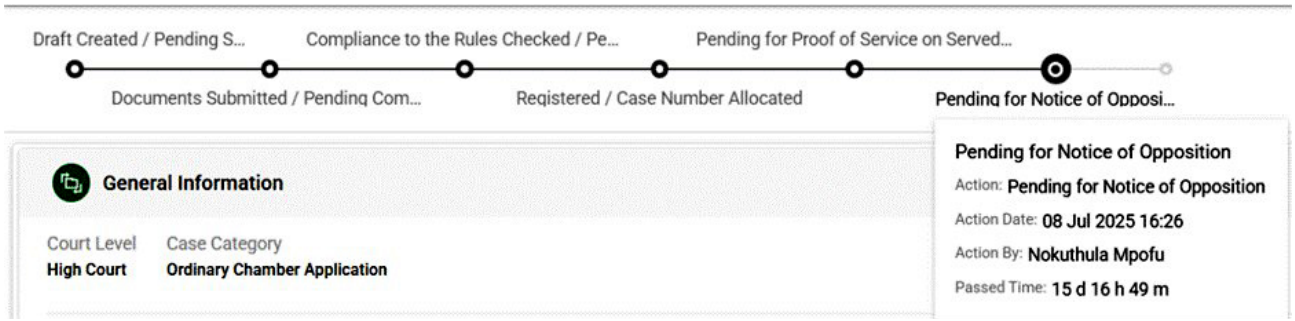

Fig. 3. Screenshot of a subway map generated from the system

Source: IECMS platform screenshot.

The above feature allows litigants and court staff to quickly see the case history and the current state of the case. Each node is clickable, and when clicked, it displays a dropdown showing the actions done on that node by the responsible court staff as the case moves through its life cycle. It gives the details of the user who performed an action, including the date and time.

3. Online Payments.

Through the PayNow gateway, which is integrated into the IECMS, a litigant can make payments online using Mobile Money and Zim Switch for local currency. Foreign currency payments can be made on the platform using Visa Card, Mastercard, and Inn-bucks.

The feature allows litigants to make payments for a variety of issues. The payments are possible regardless of whether one is in Zimbabwe or outside the country. In either case, there is no need to visit a courthouse for that purpose. Once an e-payment is made, the system automatically confirms payment and records the transaction. It has greatly eased administrative duties and reduced the handling of cash by members.

4. Virtual Hearings.

The virtual hearing platform is a feature in which court proceedings are conducted remotely using the video conferencing facility, which is available on the IECMS. Instead of appearing physically in a courtroom, participants who include judges/magistrates, litigants, and lawyers connect from separate locations to argue their cases in real time, online. The participants must have computers or some other smart gadget that is adaptable to virtual hearings. The gadget must have a working microphone, a video camera, and speakers, to enable the participant to speak and to hear as well as be seen by others during the interaction (Mabhodha & Choga, 2021). Only the assigned court staff and the parties to the case can access the virtual sessions scheduled in a particular case. Court staff are responsible for creating the sessions.

When creating a session, court staff usually indicate whether the session will be physical or online. Once a session is scheduled to be online, all parties, including the assigned court staff, will receive a notification with a link to join the online session. Figure 4 provides an illustrative screenshot of an online session notification generated by the system. It illustrates how parties are notified of an online session and provided with access details, which supports timely participation in virtual hearings.

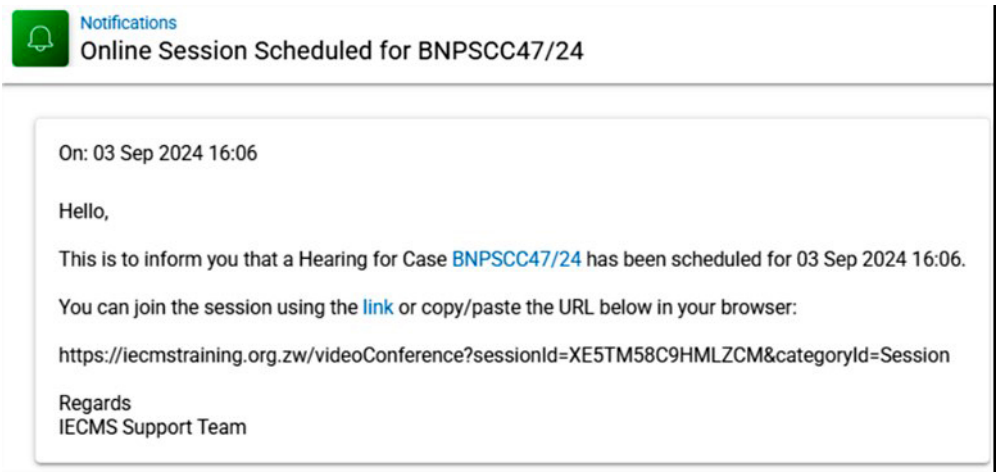

Fig. 4. Screenshot of an online session scheduled

Source: IECMS platform screenshot.

5. E-Calendar.

As stated above, prior to conducting a hearing, a session for the hearing must be created indicating whether the hearing will be physical or virtual. When creating a session, court staff specify (i) the date and time of the hearing, (ii) the session participants, and (iii) whether the session will be held physically or virtually. After the session is created, a session number is allocated. The number will for instance appear like SE00000001. It identifies sessions within a particular case. The scheduled sessions are automatically diarised. Those sessions serve to notify and remind court staff and litigants of when cases are being heard by the court. It is an electronic diary that is available in the account of every IECMS user. The calendar shows the sessions that the user is supposed to join.

Further, the e-calendar functionality adds convenience to litigants because they can access court rolls from the comfort of their homes or offices. It is equally convenient to judicial officers because they can electronically diarise cases.

6. E-signing and e-stamping.

The process of litigation involves the submission of court processes, pleadings, letters, and other documents by litigants to the court. The acceptance of these documents into the court system is commonly referred to as filing. The documents are deemed to have been successfully filed when the registry officers have stamped and signed them. Thereafter, they become official court documents. Before the advent of IECMS, the process was all manual. The stamps were physical. The same applied to signing of documents, which was done by the officer appending his or her signature using a pen on the documents.

In contrast, the IECMS has a feature that allows for the electronic stamping and electronic signing of documents. Each registry staffer and judicial officer has their own unique signature which cannot be accessed by another. The function is tamper proof.

7. Merging of documents.

Litigation involves the submission of numerous documents at different intervals. In addition, a single case may involve several litigants each filing their own documents separately. A judicial officer may not be able to make sense out of all those separate pleadings unless they are consolidated to form a single continuous document arranged in accordance with the pleadings' chronological order of submission and paginated. The consolidated document is prefaced by an index displaying the table of contents. In the paper era, the process used to be tedious to say the least. Under IECMS, it has been automated. PDF documents within the system can easily be merged to generate a consolidated record with automatic pagination. The generated table of contents is interactive. Merging documents can be done when filing a new case or uploading subsequent pleadings. With this feature, there is no need for the litigant to print the different documents within the case and then create an index.

8. Communication and notifications.

Before the introduction of IECMS, litigants could only enquire about the status of their cases through writing letters, which would take ages before being responded to, or by physically attending at the relevant station. In addition, all process was required to be served physically. All these cumbersome procedures have been supplanted by the notification functionality on the IECMS. Through it, litigants are notified of every change in the status of their cases. There is no longer any need to go to court to check the updates of the case. Service of all subsequent processes is equally performed through the system. The notifications sent out to litigants are varied. They can be system notifications, email notifications, and in some instances, SMS notifications. The notifications are generated whenever there is an activity in a case, such as when the case workflow is moved or a pleading is submitted or accepted. The SMS notifications are only sent when the case is registered or when a hearing is scheduled and when the case is finalised. To keep the litigant or user alerted, the IECMS has a system notification counter which shows the total number of unread notifications on a notification bell which appears on the face of a portal once it is opened. If a system notification is read, the counter automatically subtracts it from the total number of unread notifications.

9. Order verification through QR code.

The acronym 'QR' stands for Quick Response. When scanned, the QR code allows the user to access information instantly – hence the name Quick Response code. That code is attached to every document generated by the system. It is used to verify the authenticity of court orders. Any person with a printed court order can verify whether it was generated by the court without even logging into the system. The feature went a long way in addressing the previously rampant challenge of fake court orders and other documents generated by unscrupulous elements for illicit gain.

10. Audit trail.

Any activity on a case is tracked and recorded. Every activity leaves digital footprints in the system. The tracked activities include logging in, viewing anything, updating, and creating any document within the system. Every user of the system is tracked, including the system administrators. This feature ensures transparency and accountability on the part of the system users.

11. General document handling.

The IECMS has the capability to upload and download documents in various formats which include PDF, Word, Excel, video, audio and picture. For proper storage management, the system accepts a maximum document size of 75MB.

12. Reports and dashboards.

The system also has a dashboard reports functionality. The dashboard provides an interface for the creation and display of reports on case performance, finances and trends. That includes the ad hoc reports feature, which will enable every court staff or litigant to generate, interact with, and share their own personalised reports in various formats such as tables, graphs, and charts.

13. Collaboration.

When judgments are still in draft state, a judge is able to share his/her judgment with other judges for their input. The system allows those other judges to input their suggestions and share them with the author of the judgment. In instances such as appeals, where a case is heard by a panel of two or more judges, the collaboration functionality is indispensable. When one of the judges creates an order or drafts a judgment he/she is able to send it to the other members of the bench for additional input, proofreading and signing. When all the judges sign, the order or judgment becomes finalised.

As is clear, the function enables court staff working on the same case to interact using comments and tasks. Several court staff can work on the same case simultaneously without challenges. For example, a judge may be creating an order whilst the registrar is creating a task, and a clerk is creating a session on the same case simultaneously. The system, however prohibits different users from editing the same case at the same time.

14. System Extensibility and Flexibility.

The IECMS is extensible in that it allows for further functionalities and changes to existing functionalities without the need to be completely rewritten. Put differently, the system is flexible enough to accommodate related technological changes without significant alterations to its architecture. The IECMS allows integration with other systems, for example, currently, it is integrated with a payments software called PayNow[36].

15. System Security.

The IECMS has segregated role-based access levels of different users. Access is strictly through the use of a User ID and a User Password which are unique for each

[36] In Zimbabwe PayNow is a comprehensive online payment gateway for business and individuals to process and receive payments.

application user. In addition, every user is assigned to a particular group/role, where that group has its own access level in using the system. For example, litigants do not have access to cases that they are not part of but the registrar has access to all cases at his/her court station. In addition, the system supports data encryption, ensuring that data access is restricted to only authorised users. It maintains data consistency, accuracy, and integrity in addition to using Secure Socket Layer security to protect all IECMS transactions against unauthorised access. The JSC has procured its own Data Centre equipment, which has been deployed at two different sites to avoid system downtime and to ensure that the system runs continuously without disruption. The Data Centre is manned by engineers employed by the Commission who maintain and monitor it around the clock[37].

2.3. IECMS Technical Support

Courts' digitisation is a highly technical area that can only be implemented with reliance on qualified Information and Communication Technology personnel. The development of the system, its deployment into the courts, and the post deployment support required the JSC to employ suitable ICT personnel who would attend to various technical issues connected to and related to the use of the system. A full-fledged ICT department which never used to be in place in the history of the organisation was introduced with various job categories and areas of speciality. As the digital evolution took place from the first desktop application to the current system, the IT department grew exponentially to meet the increased demand for technical support. In 2012, the Judiciary ICT needs were attended to by one ICT officer with the help of two individuals on secondment from the Zimbabwe Prisons and Correctional Services. With the advent of IECMS, the need for ICT officers with a variety of skills became evident. Thereafter, the department, which is the technical backbone of the entire system rapidly expanded. It now has over two hundred members of staff providing various forms of technical support and deployed to all court stations across the country. It is headed by a Head of ICT supported by two deputies. One of the deputies is in charge of Digital Courts, whose mandate is to look after the IECMS software and its functionalities, whilst the other is in charge of networking and maintenance. The three managers and five other technical persons went for six weeks of training in Armenia[38] where they acquired specialised knowledge on the use, management and maintenance of the IECMS. They have now been deployed around the country in the courts as E-Courts Experts. Some of the key specialised areas are as illustrated below[39];

37 The report by the Secretary of the Judicial Service Commission to the JSC, November 2023, at p. 10.

38 This is where Synergy International, the system designer and developer is domiciled.

39 Report by Secretary of JSC to Judicial Service Commission, July 2022 at p 9, where it is indicated that Treasury had given the JSC concurrence to recruit 121 ICT specialists who will maintain and man the IECMS.

– Hardware and network specialists were hired to manage, monitor, and repair computer systems and evaluate the network's performance, increase network capacity, and oversee network security.

– Data centre engineers were hired to establish, monitor and support the JSC Data Centre and system servers.

– A System analyst was hired to analyse current and upcoming systems to find any flaws or inefficiencies, and plan solutions to resolve all issues and ensure long-term effectiveness.

– Backend developers, Front-end developers, and Business Intelligence developers, were hired to automate JSC internal systems as well as support the development and improvements of IECMS.

– Cyber security specialists were hired to planning, implementing, managing, monitoring and upgrading security measures for the protection of the organisation's data, systems, and networks.

– Help desk administrators were hired to respond to queries over the phone, via email, and in person, and implement effective solutions.

– Each Province has a principal ICT officer deployed to attend to all ICT and system-related issues, and in addition, each station has an office with e-filing officers to provide first-hand support to litigants who are computer illiterate, who may not have the necessary gadgets or internet. They also attend to Internet Hub centres[40].

– Call centre agents have been deployed at the JSC call centre, which is operational daily and whose role is to receive and attend to queries, questions, and assist users who may be having challenges in using the system.

The deployment of these ICT specialists effectively addressed some of the criticisms which had been identified by some writers as a significant challenge to the digitisation of court processes in Zimbabwe[41], particularly that of technological illiteracy and deficiency in competent ICT skills among court officials (see the comments by Muparadzi & Mukonza, 2024)).

2.4. Registration as a system user

For one to access the IECMS, there is need to create a personal account. The process of creating a personal account involves registration. Upon accessing the IECMS login page, an option to register is provided wherein a user registration form opens and the user provides their details as required. What is required to access ZimIECMS is the following: -

– A desktop computer, laptop, smartphone, iPad, or tablet, with a web browser installed

– Internet connectivity

– A valid email address.

[40] Internet Hub is the bigger version of the E-Filing office. It is constituted of not less than five desktop computers.

[41] See comments by Muparadzi and Mukonza (2024).

The following steps are a guide on how to register on IECMS

Step 1: Connect your device to the internet

Step 2: Open the browser on your device

Step 3: Type in the URL- www.zimiecms.org.zw

Step 4: Click 'Register' to enter all the registration information

Step 5: Fill in the required information (first name, surname, country code, cell phone number, username, password, security question, answer).

Step 6: Sign in to the email account you provided in the registration page

Step 7: Open the email from 'ZimIECMS' and click on 'Activate'

Step 8: Login to the IECMS using the email and password that you have provided on the registration page[42].

The system allows the user to manage their profile and are able to change any details that they would have provided upon registration. The changes are accessible when the user logs onto IECMS and access the system header on the user's username and in turn access the user's profile option.

2.5. Court requests

Court requests are a feature in the system that one uses to access a case for the first time by being linked to it. There are different types of court requests serving different functions.

I. Party Related User Assignment Requests. This is a request made by a user who had a pending or active case already in the court at the time IECMS was deployed to that court. To have access to that case whose contents would have been converted from hard copy to soft copy and imported onto the system, the user must first register into the system, and then request to be linked to that case through the court request functionality. There may also be litigants or legal representatives who are served with court processes and would want to be linked to the case to enable them to respond or litigate. They must request to be linked by making the court request. The above court request is what is termed a request to be linked to a case. Once the request has been completed, the user would be linked and the case will appear in their portal. They will have access to the documents and updates relating to that respective case.

II. Document Request. This type of court request is available for requests of court documents, particularly court orders, rulings, judgments or transcripts of proceedings wherein a payment is required before the document may be accessed.

III. Document Stamping and Other Requests. There may be documents brought to court for stamping that do not form part of any record already in existence. For example, a warrant of search and seizure, a subpoena or a summons. Such documents can be uploaded onto the system under document stamping court request and are stamped for issuance.

[42] The full process of registration is clearly laid out with visuals in the 'IECMS Getting Started Guide for Public Users', that can be accessed once a user logs into IECMS.

IV. Case Reactivation Request. The IECMS has an electronic archive deposit feature, where after the lapse of three months, completed cases are automatically deactivated. There are however instances where such cases are reinstated by an order of court or where the parties, may for example, seek variation of the existing order. Such cases are brought back into the live environment of the system through the court request feature. The case would then be reactivated and the user will thereafter have access to it and be able to file any subsequent documents.

V. Interpleader Request. The interpleader request is a function exclusively used in the office of the sheriff. Where one wants to file an interpleader with the sheriff of the High Court, it is done using that functionality.

2.5.1. IECMS User Support Features

The IECMS is supported by two fundamental functionalities which allow users to be assisted whenever they face challenges in using the system. The functionalities serve as the first level support in cases of any inquiries, problems, change requests and any other system related issues. These features are as follows:

a) Call Centre Agents. The JSC established a 24-hour call centre with a dedicated number +2638688007422. The centre is equipped with well trained professional call centre agents who are proficient in English, Shona and Ndebele, the three commonly used languages in Zimbabwe. The agents work day and night shifts. System users facing challenges on the IECMS or queries, can call the centre number and be assisted over the telephone. All calls made to the call centre number are recorded for purposes of quality control. There are always technical personnel on duty to support the call centre agents on deeper technical issues such as configurations within the system.

b) Online Help Desk. The system is also supported through an online help desk platform with a dedicated email address called zimiecms@jsc.org.zw. That platform allows users to send their queries via email to the JSC. It is manned by Help Desk Administrators who are required to respond to all emails immediately. The help desk administrators can provide both first and second level support meaning that they can deal with any system challenge without limitation. All communications to the help desk email address are also recorded for quality control and statistical purposes. Table 1 summarises the volume of IECMS user queries received through the call centre and the help desk email platform from 2022 to 30 November 2025.

Table 1. Progressive report on IECMS user queries as at 30 November 2025

Year	Call centre a dedicated number 002638688007422	Support service with an e-mail zimiecms@jsc.org.zw
2022	803	1195
2023	1251	1728
2024	1217	1452
2025	1318	1657
TOTALS	4589	6032

The table shows that, over the period under review, queries submitted via the help desk email platform exceeded those received through the call centre, indicating sustained reliance on written support channels.

Figure 5 presents the distribution of user queries by channel over the period under review.

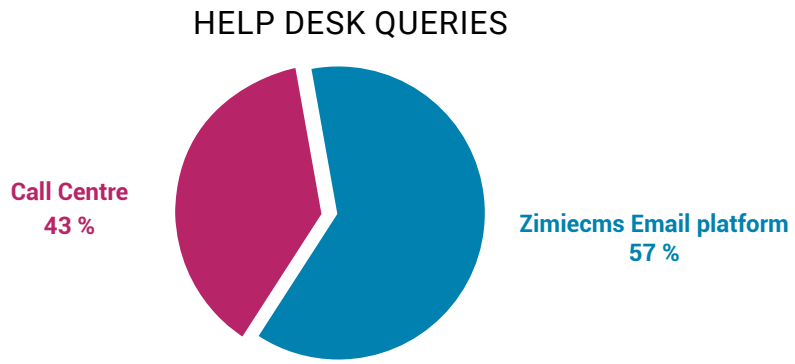

Fig. 5. Distribution of IECMS user queries by support channel, 2022 to 30 November 2025

Source: Judicial Service Commission help desk and call centre query logs, 2022 to 30 November 2025.

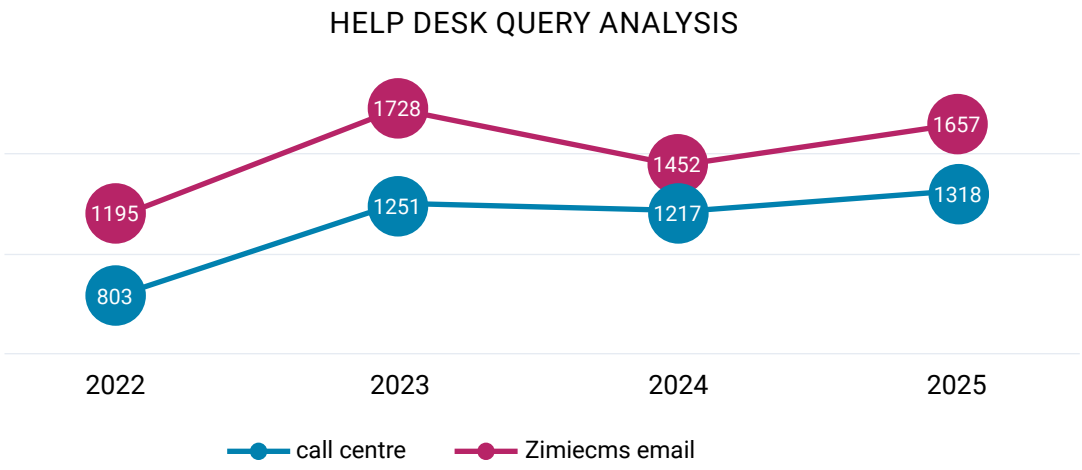

Fig. 6. Year-on-year trend in IECMS user queries by support channel, 2022 to 2025

Source: Judicial Service Commission help desk and call centre query logs, 2022 to 30 November 2025.

As can be seen, a hike was experienced in 2023 when the IECMS was launched in the High Court but since then the queries have been steady in terms of increase or decrease. When the system was launched in the Magistrates' Courts under phases 4.1 and 4.2, most of the queries are being answered at station level either through the station help desk or through the IT officers there present.

Table 2 summarises the nature of queries attended to by help desk administrators and call centre agents.

Table 2. Query categories handled through IECMS user support channels, as at 30 November 2025

Query category	Share, %
New IECMS account opening	25
Password reset	10
Lawyer changing law firm	8
Account details update	2
JSC related complaints	2
Account disabling	2
Other categories	1
New law firm creation	5
Workers' union registration	10
Request for email opening	18
Missing case entities	6
How to request document stamping	3
Failure to access case in portal	5
Failure to file	3

Source: Judicial Service Commission help desk and call centre query logs, as at 30 November 2025.

The table shows that the highest volumes relate to user onboarding and account support, including new account opening and requests for email opening, with additional demand linked to routine access and filing challenges.

2.6. Impact of courts digitisation in Zimbabwe

Having set out the background of the digitisation of the court system in Zimbabwe, through the adoption and implementation of the IECMS, the paper now turns to interrogate the impact of the IECMS generally and on judicial independence and judicial accountability specifically.

2.6.1. Digitisation and Judicial Independence

The principle of judicial independence is paramount to the functioning of a constitutional democracy. The Constitution of Zimbabwe recognises the centrality of judicial independence. The Constitution reposed in the JSC, the responsibility to promote and facilitate both the independence and accountability of the Judiciary[43]. Furthermore, in its provisions outlining the principles that guide the Judiciary, the Constitution requires members of the Judiciary to strive to enhance their independence in order to maintain public confidence in the judicial system[44]. Section 164(1) and (2) of the Constitution also contain provisions that require judicial officers to collectively guarantee and safeguard the independence, impartiality, and effectiveness of the judiciary. It reads:

[43] See section 190(2) of the Constitution of Zimbabwe, 2013.

[44] See section 165(2) of the Constitution of Zimbabwe, 2013.

"164 Independence of judiciary.

(1) The courts are independent and are subject only to this Constitution and the law, which they must apply impartially, expeditiously, and without fear, favour or prejudice.

(2) The independence, impartiality, and effectiveness of the courts are central to the rule of law and democratic governance, and therefore —

(a) neither the State nor any institution or agency of the government at any level, and no other person, may interfere with the functioning of the courts;

(b) The State, through legislative and other measures, must assist and protect the courts to ensure their independence, impartiality, dignity, accessibility, and effectiveness, and to ensure that they comply with the principles set out in section 165"[45].

Section 164 of the Constitution safeguards the independence and impartiality of the courts by prohibiting interference from any source, including the State. It imposes a constitutional obligation on the State to protect and support the judiciary in upholding justice and the rule of law[46]. Under section 164(1) of the Constitution, the independence of the judiciary is guaranteed with the affirmation that the courts are subject only to the Constitution and the law, which they must apply impartially and without bias[47]. Further, section 164, in effect, prohibits any improper influence on judicial officers, as a measure of ensuring that they can perform their duties without interference or bias throughout their tenure in office[48]. That safeguard maintains the integrity of judicial decisions and upholds the rule of law[49].

Reflecting the constitutional mandate, judicial independence can be understood simply as the ability of the judiciary to function without external pressures or influences, ensuring fair and impartial administration of justice[50]. The Australian jurist, Sir Ninian Stephen, propounded a similar idea on the meaning of judicial independence:

"What its precise meaning must always include is a state of affairs in which judges are free to do justice in their communities, protected from the power and influence of the state and also made as immune as humanly possible from all other influences that may affect their impartiality"[51].

45 See section 165(2) of the Constitution of Zimbabwe, 2013.

46 Section 164 of the Constitution of Zimbabwe, 2013

47 Adapted from the paper by the Hon. L. Malaba, Judicial Independence (Harare: Judicial Service Commission, 2020) at p.3.

48 Ibid.

49 Ibid.

50 Laws Learned. (2024, July 13). Judicial Independence in the Digital Age: Challenges and Solutions. Laws Learned. https://clck.ru/3SL77C

51 Stephen, N. (1989). The Inaugural Oration in Judicial Administration: Judicial Independence (Victoria: The Australian Institute of Judicial Administration Incorporated, 1989) at p. 6. https://goo.su/7pJ0uFJ

Judicial independence is grounded in the principle of separation of powers, under which the courts operate independently from the executive and legislative branches of a state (Wallace, 2001). The International Commission of Jurists ("the ICJ") defined judicial independence as:

"That every judge is free to decide matters before him in accordance with his assessment of the facts and his understanding of the law without any improper influence, inducement or pressures, direct or indirect, from any quarter or for whatever reason"[52].

It has been previously observed that judicial independence is a concept that enjoys universal recognition in the modern era, where civilised states endeavour to promote justice as a central tenet of their legal systems, regardless of their affinity for common law or civil law systems[53].

The value of judicial independence lies in its role as a safeguard for impartial and independent judicial decision-making[54]. Judicial independence enables the judiciary to fulfil its constitutional mandate. The principle guarantees an impartial and fair resolution of disputes while protecting individual rights, thereby sustaining the rule of law and advancing justice (Reen & Verma, 2023). The absence of judicial independence erodes the judiciary's effectiveness, relegating it to a subordinate role where it merely validates partisan agendas, rather than upholding the law and dispensing justice.

Given this critical importance, safeguarding judicial independence requires robust institutional mechanisms. The IECMS's deterrent effect on corrupt behaviour positively impacts the judiciary's credibility and institutional independence. A system that inherently deters corruption fosters conditions in which judicial officers and court personnel can act without fear of coercion or manipulation. That helps to insulate the judiciary from political, financial, or personal pressures. Judicial officers are in turn, able to carry out their duties fairly, impartially, and in accordance with the law. In that way, the digitisation of court systems does not only promote integrity within the system but also reinforces the fundamental principle of judicial independence. An important factor in IECMS that promotes judicial independence is the minimisation, if not complete removal in some instances, of physical human contact between the judicial officer and support court officials on one hand and the litigant or any other interested party on the other. It is a requirement under the system, that any interaction and or communication that a court official undertakes with a litigant or user of the system or vice versa must be done on the system. That requirement extends to exchange of correspondences. Everything must

52 Brody, R. (Ed.). (1990). Special Issue on the Independence of Judges and Lawyers: A Compilation of International Standards. Centre for the Independence of Judges and Lawyers Bulletin, April – October. https://clck.ru/3SL7dF

53 The Honourable Mr Justice. L. Malaba. Judicial Independence (Harare: Judicial Service Commission, 2020) at p.2. www.jsc.org.zw

54 Murati, G. (2004). The Independence of the Judiciary and Its Role in the Protection of Human Rights under UN Administration Using the Case of Kosovo. European Society of International Law, Agora Paper.

be done in the full glare of the system and remains accessible to all parties with access rights to the case. As much as that feature mitigates corruption, it also frustrates any external parties who may wish to interfere with the decisional independence of judicial officers, which in its own right, is a form of corruption. Through the virtual hearings component, the IECMS not only promotes transparency but more fundamentally it enables the automatic recording of all the hearings and ensures that there is always a record of the proceedings. It dissuades manipulation of or interference with the court's record of proceedings. In addition, the possibility of interference with judgments handed down or court orders issued has completely been eliminated because such judgments and orders are not handed to parties individually or privately but must be uploaded onto the system where each party is able to view and access them. Further, another key benefit is that the system automatically tracks and logs any changes made to documents or case files. That creates transparency because of every user's knowledge that all actions are recorded and traceable.

In conclusion, there is no doubt that the IECMS, through its specific technological capabilities has greatly enhanced judicial independence in Zimbabwe. It fundamentally transformed court processes and reshaped how courts operate and how justice is administered. It is a platform that protects judges from outside influence. The transition to filing cases online therefore strengthens judicial independence.

2.6.2. Digitisation and Judicial Accountability

The paper advances the proposition that judicial accountability is an allied concept to judicial independence. Judicial accountability like independence, is a fundamental principle necessary for the continued legitimacy of the judiciary. It ensures that judges are held responsible for their actions, thus promoting fairness, transparency, and public trust in the legal system[55]. The Honourable Ernest L. Sakala, former Chief Justice of Zambia, defined judicial accountability as follows:

"The concept of judicial accountability can broadly be said to refer to the notion that Judges or those who sit in Judgment over others need to account for their judicious and injudicious conduct. The emerging right to democratic governance has come with a call for accountability of all public institutions"[56].

The concept of judicial accountability ensures that the judiciary remains answerable to the people while maintaining its independence from external influences in the performance of its duties.

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[55] Sebitlo, T. (2024, August). Judicial accountability: An era for consciousness. Advocate. https://goo.su/gjgMFH

[56] The Honourable Mr Justice E L Sakala. The Accountability of the Judiciary – Accountable to Whom? Is There Such a Mechanism? (Paper presented at the Southern Africa Judges Commission Meeting, Windhoek, Namibia, 2005). https://clck.ru/3SL8AK

In Zimbabwe, the Constitution entrenches the concept of judicial accountability by requiring that all members of the judiciary must respect and honour their judicial office as a public trust and must strive to enhance their independence in order to maintain public confidence in the judicial system[57]. Section 190(2) provides that the JSC must promote and facilitate the independence and accountability of the judiciary. The provision places accountability at the centre of the JSC's role, given that judicial offices are a public trust. Section 190(2) charges the JSC with the responsibility to promote and facilitate accountability throughout the judiciary.

To fulfil that constitutional mandate, the digitisation of court systems has emerged as a powerful mechanism for the enhancement of both transparency and accountability. One of the ways in which the IECMS promotes accountability is by recording the footprint of every user on the system. That way, the system becomes temper-proof. The paper has noted that as a result of the IECMS, the digitised courts in Zimbabwe have done away with manual and paper-based court processes. All court processes and case management processes are initiated and finalised electronically. In that regard, the IECMS has become a major tool for transparency and accountability in the court system in Zimbabwe.

The IECMS has also improved judicial accountability by enforcing clear timelines in terms of which court processes must be completed. Due to its automated nature, judicial officers are duty-bound to ensure compliance with case-disposal timelines. The system enables them to track pending cases and identify the specific stages at which they are delayed. Litigants have similarly benefited from an accessible online case-tracking feature. Complementing that, the IECMS's linkage to litigants' email accounts provides timely, automatic updates on every development in a case. These integrated mechanisms have enhanced transparency, resulting in greater public acceptance of the system and renewed confidence in the judiciary. Arguably, the introduction of IECMS has significantly diminished challenges, including case backlogs, corruption, physical and geographical barriers to court access, and the high costs of serving legal documents. The system also promotes judicial efficiency by filtering out non-compliant matters before they reach the hearing stage.

The effectiveness of these accountability mechanisms is reflected in measurable operational improvements since the IECMS's launch in 2022. The Constitutional Court's clearance rate rose sharply from 36 per cent in the 2022 pre-IECMS period to 56 per cent post-launch[58]. The upward trend continued in subsequent quarters, suggesting enhanced adjudicative efficiency. In 2023, the Superior Courts lowered their backlog from

[57] See section 165(2) of the Constitution of Zimbabwe, 2013.

[58] Muserere, S., & Watson, A. (2023). Best Practices and Approaches to Judicial Digital Transformation: Zimbabwe IECMS Case Study. The Court Administrator, 15, at p. 13.

2,127 to 1,381 cases and disposed of 30,560 matters compared to 29,433 new cases[59]. The gains were evident across the Supreme Court, the High Court, and the Labour Court[60]. The observation was also made in a government report, which noted that during the first half of the implementation of National Development Strategy 1(NDS 1), 87,3 per cent of court cases were cleared. The performance was due to the introduction of the IECMS, which assisted in clearing a backlog of cases that had built up in most courts across the country[61]. The comment, therefore that the introduction of IECMS in the courts in Zimbabwe has failed to deal with the paper-based challenges of delays and back-logs may not be merited[62], as the statistics provided above speak to the contrary.

The system has also modernised access and reduced congestion in courthouses. Online payment usage grew from 25 per cent to 39 per cent in the Constitutional Court and from 37 to 42 % in the Commercial Division of the High Court between 2022 and 2023[63]. Virtual hearings became widespread; nearly 100 per cent of surveyed court personnel and practitioners found them at least somewhat helpful, with 28 per cent describing them as very helpful[64]. The Supreme Court now hears all chamber applications virtually, with recordings providing an audit-ready record. Litigants saved time and transport costs. Justice delivery has been decentralised, allowing remote users to access courts without prohibitive travel.

Finally, routine matters such as document filing and queries are now handled online, greatly reducing congestion at court registries. Legal practitioners spend less time queuing and more time on substantive work, while courtrooms are reserved for essential in-person proceedings. Litigants can file pleadings, respond, track cases, raise queries, make payments, attend hearings, and retrieve orders and judgments electronically. These advances have strengthened public confidence in the system's efficiency and demonstrated a more accountable administration of justice in Zimbabwe.

The achievements stand in stark contrast to the pre-IECMS environment. At the outset of the paper, it was observed that the IECMS was not introduced in isolation but was strategically implemented, among other obligations, to facilitate the JSC's mandate to promote judicial accountability. It is positive to note that the lack of transparency and perception of corruption that had afflicted the judicial system prior to the launch of the

59 Magadu, C. (2024, January 14). Courts deliver stellar performance in 2023: Tackling backlogs and enhancing efficiency. Sunday News. https://goo.su/EzKQKt

60 Ibid.

61 The National Development Strategy 1(NDS 1) Mid-term review, January 2001 – June 2023, paragraph 607, page 102.

62 See comments by (Mukonza, 2024).

63 Muserere, S., & Watson, A. (2023). Best Practices and Approaches to Judicial Digital Transformation: Zimbabwe IECMS Case Study. The Court Administrator, 15, at p. 13.

64 Ibid.

IECMS has been markedly reduced since the adoption of the IECMS. Under the paper-based case management system, the movement of case files and documents was untracked, and unauthorised alterations could be made without notice. The environment contributed to the perception and occurrence of corruption and unethical practices within the court system. Needless to say, corruption challenges the idea of justice and the purpose of the establishment of the courts[65]. Once corruption is involved in a court system, there can be no fairness in the treatment of litigants[66]. The IECMS negates that idea of corruption because it enables all parties involved in a case to track and monitor its progress. Such transparency limits the ability of court staff to interfere with or alter filed processes[67].

From the foregoing, it is clear that judicial accountability is upheld as a vital principle in Zimbabwe's constitutional framework. As a twin concept to judicial independence, judicial accountability complements it rather than constrain or intrude upon it. As judges are entrusted with safeguarding the Constitution and the fundamental human rights and freedoms of citizens, they must be answerable to the public for their judicial conduct and performance. The public should take the liberty to reasonably critique judicial conduct when it appears to deviate from expected standards[68]. Through the digitisation of Zimbabwe's courts, the IECMS forges a natural connection between judicial independence and accountability, ensuring the court remains the adjudicator while the public engages it as users. Judges remain accountable to the public, who are now independently empowered to actively track the progress of their cases through the many tools available on the IECMS. At the same time, the system protects judicial officers from interference by other branches of the State by assigning secure, individual accounts accessible only to the presiding judge. In this way, the IECMS upholds judicial independence while also recognising the judiciary's responsibility to ensure accountability and transparency in the administration of justice.

2.7. Endorsement of ZIM IECMS

The successes by the Judiciary in Zimbabwe in its courts digitisation journey have not gone unnoticed within the country, in the region, and beyond. Since the advent of IECMS, the judiciary has experienced unprecedented visits, study tours, and benchmarking visits by various sister jurisdictions in the region. Such visits are clearly an endorsement by counterparts of the effectiveness of the system. Various judicial and non-judicial

65 U4 Anti-Corruption Resource Centre, 'Basics of Corruption and the Justice Sector' (n.d.). https://clck.ru/3SL8T2

66 The Honourable Mr Justice L Malaba. Digitisation of the Courts and Access to Justice: The Zimbabwean Experience. Paper presented on the occasion of the Zambian Judicial Conference, December 2022.

67 See also comments by Muparadzi and Mukonza (2024), when they stated that the use of digital systems in Zimbabwean judicial systems enhances transparency and accountability. Digitization improves transparency by eliminating manipulation of manual systems and case tracking, reducing delays and corruption.

68 Hon. Ernest L. Sakala, note 58, at p. 5.

members of the JSC have been invited to diverse fora to deliver papers, presentations, and lectures on Zim IECMS.

The confidence and belief in the system by members of the JSC and system users grew gradually from the time the system was deployed in the first phase. In 2022, when the system was launched, it had a total of 4437 users, who included court staff, legal practitioners, prosecutors, and public users. This number has grown so phenomenally that, as at 30 November 2025, the total number of system users was 114216. Table 3 summarises the growth in IECMS users, which demonstrates the confidence that users now have in the system.

Table 3. Growth in IECMS users, 2022 to 30 November 2025

Year	Court staff	Legal practitioners	Prosecutors	Public users	Totals
2022	41	2908	23	1465	4437
2023	172	3981	41	13 093	17 287
2024	249	8541	5	30 194	38 989
2025	1251	9396	200	42 656	53 503
TOTALS	1713	24 826	269	87 408	114 216

Source: Judicial Service Commission IECMS user registration records, as at 30 November 2025[69].

Table 3 shows sustained growth across all user categories, with the most pronounced increase among public users, alongside notable expansion in registered court staff and legal practitioners as the rollout progressed.

The system has been given positive reviews on its impact on litigation, with one senior legal practitioner commenting as follows:

"The cases are now run on a non-paper basis; it's an electronic-based system, it's a virtual court system, it's paperless, so what that means is I can sit here and file the court papers, the registrar will receive them, process them, and they will be served on the platform on the defendant"[70].

The Secretary General of the Progressive Commercial Trades and Allied Workers Union, Tawanda Mupeti, also commended the digitisation programme, stating that it will address the corruption within the judicial system[71].

In 2022, the Deputy Chief Justice of the Judiciary of Namibia led a delegation of Judicial officers and administrators from the judiciary of Namibia on an IECMS benchmarking visit to Zimbabwe and a study tour of the Commercial division of the High

69 Parly issues adverse report on court electronic management system. https://clck.ru/3SxUdh

70 Addington Chinake, a Senior Legal Practitioner and Partner at Kantor and Immerman Legal Practitioners. https://clck.ru/3SLCKy. See also comments by advocate Arthur Marara, The Miranda Magazine, 33rd Edition, September 2023, at p 24. https://clck.ru/3SLCQU

71 https://clck.ru/3SxU8c

Court, which is the first paperless court in the history of the judiciary in Zimbabwe[72]. Speaking to the press after meeting the Chief Justice of Zimbabwe, Honourable L. Malaba, Deputy Chief Justice Petrus Tilenge Damaseb commented as follows:

"We came here to benchmark with our Zimbabwean colleagues in terms of renovations and reforms that have been introduced here in commercial dispute resolutions. So we are specifically focusing on the operations of the Commercial Court of Zimbabwe because we are also looking at introducing a similar court in Namibia. We are here to learn from our colleagues what they are doing in that respect, that is why we are here"[73].

In 2023, the Zimbabwe Judiciary hosted the Judiciary of Malawi, which came to benchmark on the successful deployment of IECMS in the courts. Back in Malawi, the visit was described in the following terms:

"In August 2023, another delegation from the judiciary visited Zimbabwe on a study tour. The objective of the tour was to benchmark on the Integrated Electronic Case Management System, successfully implemented in the judiciary of Zimbabwe, and learn how a similar project can be implemented in Malawi"[74].

In 2024, the Zimbabwe judiciary hosted the Chief Justice of the Republic of Mozambique, who was accompanied by the Secretary General of the Judiciary on an IECMS benchmarking visit. The Secretary of JSC, Dr. W.T. Chikwana, had this to say about the visit:

"The IECMS has made us a regional powerhouse on the digitisation of the courts. We continue to receive inquiries and benchmark visits from other jurisdictions. We were, in this regard, honoured to receive and host the Chief Justice of Mozambique, Honourable Chief Justice Adelino Machanga, and his four-member delegation. Their visit was aimed at gaining insights on how we have implemented IECMS, including challenges encountered"[75].

During the same period, the JSC also hosted a ten-member delegation from the Judiciary of Zambia led by the Chief Administrator, Ms Nalishebo Imataa, who came to study and seek to replicate Zimbabwe's efficient systems to enhance their own Judiciary[76]. Interestingly, Zambia has since adopted the IECMS currently in use in Zimbabwe, developed by Synergy International, as the software for its digitisation process[77].

In 2025, a delegation from Liberia also carried out a ten-day benchmarking visit not only to assess the successes scored but also to learn from the mistakes made and challenges encountered by Zimbabwe Judiciary when it deployed the system into its courts[78].

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72 The Secretary's Report to the Judicial Service Commission. (2022, 11 October), at p. 27.

73 The Herald Newspaper. https://goo.su/JDz0o9

74 Malawi Judiciary 2023 Annual Report, at p. 59. https://clck.ru/3SLDJS

75 The Miranda Magazine, 35th Edition, March 2024, at p. 3. https://clck.ru/3SLDKt

76 JSC's landmark year of justice, reform, international recognition. https://clck.ru/3SxU5s

77 See Transforming Justice in Zambia with Electronic Case Management System. https://clck.ru/3SLDQK

78 Liberian Judicial Delegation visits Zim. (2025, 3 June). The Herald. https://goo.su/tdcKKzB

The interest which the Zim IECMS has drawn from various jurisdictions can only be assessed as a vote of confidence in the system and the manner in which it has been implemented. It is a reflection on the good performance of the system and how the system has made the operations and efficiency of the courts a lot better than during the paper-based era. Having scored such successes, which have been confirmed by other jurisdictions, one may safely conclude that the implementation methodology adopted by JSC in deploying the IECMS in the courts is nothing short of a master class. The methodology also considered possible financial challenges by ensuring that resources are reserved and made available for the particular phase under implementation. The phased-out approach guaranteed that the funding of the system was equally phased out. In the end, Treasury was not unnecessarily overburdened by providing a huge financial outlay at one go. It then puts paid to the criticism levelled against the JSC that it was overzealous in pursuing courts digitisation without considering the financial constraints it faces[79].

The endorsements of the system made however, do not at all imply that the deployment of the IECMS into the courts by the JSC was without challenges. It equally does not mask the mistakes which were made along the way. The deployment of any system of such a magnitude always carries with it some challenges and difficulties. It is such challenges that shall be discussed hereto below.

3. Challenges, interventions adopted and lessons learnt

Embracing new technology can bring tremendous benefits, but it also comes with various challenges which at times, if not managed well, may affect, at the very least, the smooth implementation of a system or, at worst, may lead to a total failure and ultimate abandonment of the project. Whilst generally challenges may come about due to fear of the unknown and disruption of established routines associated with new tools and processes, they may also arise from cost and budgetary constraints, integration difficulties with existing systems, inadequate infrastructure, poor training and change management implementation, poor planning and execution, and data security fears amongst others. The challenges are not unique to Zimbabwe but affect any country that may seek such profound transitioning. What is important is not so much abandoning the project or postponing its implementation plan, but identifying the possibility of challenges and putting in place measures to ameliorate the difficulties.

A look at other jurisdictions that have implemented technology in their courts will confirm that challenges are at times unavoidable. African countries, especially, struggle to digitise due to systemic shortcomings rather than isolated issues. A primary failure lies in adopting systems designed for high-resource contexts without adapting them

[79] See comments by Muparadzi and Mukonza (2024).

to Africa's realities. For instance, Kenya's ECMS rollout neglected rural internet limitations, while Zimbabwe's power instability necessitated solar backups for IECMS continuity[80]. Investments often prioritise technology over enabling environments, such as user training or maintenance plans. Trust deficits, which signify a tangible erosion or absence of confidence within a given relationship, system[81], or within the organisation also play a pivotal role as stakeholders fear cybersecurity breaches and data misuse. Historical injustices within justice systems further erode confidence in digital alternatives, creating resistance among judicial officers, lawyers, and citizens (Rusakova & Frolova, 2022). Many African countries, particularly in rural or underdeveloped communities, lack sufficient digital infrastructure, such as data centres, to support digital court systems. The Philippines launched the E-justice System in 2013 as part of the country's broader initiative to modernise its judiciary, focusing mainly on digitising court records and introducing an online case management system (Djuraev et al., 2025). However, the Philippines faced infrastructural challenges, particularly in regions affected by natural disasters and in rural areas (Djuraev et al., 2025). In the end, the system was slow to reach all courts, leaving some areas reliant on traditional paper-based processes (Djuraev et al., 2025).

India made significant strides in digitising its legal system through the E-Courts Mission Mode Project, launched in 2007[82]. The project aimed to enhance judicial productivity and transparency through the digitisation of case records and the establishment of online court services[83]. However, despite these advancements, India's digitisation project faced challenges related to unequal access to technology. Many rural areas still lack adequate internet infrastructure, preventing equitable access to e-court services (Djuraev et al., 2025).

In Sub-Saharan Africa, countries like Kenya and Rwanda also reported significant disparities in digital infrastructure between urban and rural regions. The Irembo platform in Rwanda and Kenya's Huduma data centres have succeeded in expanding legal access in urban areas, yet rural populations face barriers that hinder full participation in digital legal services (Krupina et al., 2020). There are reports of poor network coverage as there are no data centres built in the rural areas, and there is a lack of access to digital devices as the cost of smartphones and mobile data is prohibitive for many citizens, limiting the reach of digital legal services (Djuraev et al., 2025). The result is therefore a digital divide that significantly reduces accessibility to legal services.

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80 Address by the Hon Chief Justice, Mr Justice L. Malaba on the opening of the legal year 2022 "Use of Technology to enhance efficiency and the Rule of Law in the Judiciary". https://clck.ru/3STAem

81 Trust Deficit → Term. https://goo.su/MZeyvhU

82 India, D. A. K. S. H. (2020). Whitepaper Series on Next Generation Justice Platform, Paper 2: Transition and Implementation.

83 Ibid.

South Africa's Integrated Justice System (IJS) faced challenges of uneven implementation across regions due to a lack of digital infrastructure. The South African IJS enables law enforcement, courts, and correctional services to share information seamlessly, improving case management and transparency. However, reports show that urban areas have benefited from the IJS, and the rural courts still rely on manual processes, as there are no data centres established in the rural areas (Djuraev et al., 2025).

In Zimbabwe, the JSC experienced and continues to experience implementation and operational challenges. Those challenges are ordinarily more evident at the time of launching the system in a particular court. They extend from internet connectivity, where there may be a need to increase the internet bandwidth at a particular court, to a need for additional training where some members of staff may require more training time than others to understand the system, to slow buy-in from important stakeholders. What is however gratifying is that measures have been put in place from the onset to limit the negatives caused by some of the challenges.

In Harare, for example, when the system was deployed in the general division of the High Court, the JSC under-estimated the volume of litigants and legal practitioners who would require to be linked to their cases through making court requests[84]. Because of the large volumes of cases handled in that court, the corresponding large number of litigants, and the geographical spread of stations and divisions[85] which were to be catered for, members of the Judicial Service became overwhelmed by the large volumes of people and cases that needed to be attended to at the same time. It was therefore inevitable that there were delays in processes and service provision, which in turn frustrated users especially legal practitioners. The JSC responded to the challenges by increasing internet provision at the High Court, both in Harare and Bulawayo divisions[86], establishing internet hubs at the two divisions, deploying additional staff in the form of ICT technical personnel and registry departments, and carrying out a series of meetings in various provinces with legal practitioners, where training was also conducted[87].

The most common challenges that the JSC grappled with are stated hereunder.

3.1. Electricity outages

Zimbabwe experiences incessant power outages[88]. The disruptions in power supply negatively impact business and other institutions. The courts are not spared. Poshai and

84 This is the third phase of the implementation matrix, which was done on 1st September 2023.

85 The General Division of the High Court is currently located in Harare, Bulawayo, Masvingo, Mutare, and Chinhoyi.

86 These are the biggest and busiest divisions of the High Court.

87 See comments in the JSC 2023 Annual Report at page 35.

88 Afrobarometer Dispatch No. 952 by Asafika Mpako and Simangele Moyo-Nyede: https://goo.su/PYPYze

Vyas-Doorgapersad adverted to electricity challenges and load shedding in the country, noting that this could hinder the system's reliability (Poshai & Vyas-Doorgapersad, 2023). Shortage of power is a challenge that is acknowledged and if not addressed appropriately will certainly frustrate the successful deployment of IECMS in the courts. Equally, load-shedding caused by electric power shortages is a challenge that afflicts many countries in Africa particularly those in Southern Africa[89]. It will however be folly for one to ignore and wish away the technological advancements that are taking place throughout the world, especially in information and communication technology, on the excuse that there is shortage of electricity. It is the reason why jurisdictions such as South Africa, have forged ahead and made progressive advances in the deployment of digital technology in the courts despite such electricity challenges[90].

The shortage of electricity in this context, should therefore be viewed more as an opportunity to explore other alternative sources of energy outside electricity, such as generators and solar systems, than as a challenge that should hinder the progress in courts digitisation. Before the advent of IECMS, power outages in the courts had always been an on-going challenge, because the courts ran on machines for recording and transcription purposes. Computers and court lighting equally required electrical power. For those reasons, the JSC had long set out to acquire alternative sources of power for the running of the courts when it turned to the use of generators and installation of solar systems. As at the time of writing, all court stations under IECMS have benefitted from alternative schemes of power generation[91]. Solar energy has been described as the most abundant, fastest, and cheapest energy source on earth, and it generates minimal greenhouse gas emissions[92]. The JSC may need to consider relying more on solar energy at the courts, as it is cheaper and more viable than generators.

3.2. Data and gadgets challenges

The challenges presented by the lack of data and compatible gadgets to use is constantly adverted to and cannot be ignored. As already indicated elsewhere in this paper, the IECMS is web-based system. One would need access to the internet and a compatible gadget to use for that purpose. A compatible gadget may be in the form of a smartphone, laptop, computer, or iPad/tablet. Zimbabwe's population is predominantly rural. Needless to point out, most of those areas have no access to internet let alone the adaptable gadgets. Even in the urban areas, including in some townships, access to reliable internet remains a pipe

89 Zambia struggle with electricity shortages driven by draught, Themba Hadebe, Africa News. https://clck.ru/3Supaj

90 OECD. (2025). OECD Economic Surveys: South Africa 2025, OECD Publishing, Paris. https://clck.ru/3SLDxK

91 See IECMS Implementation Progress Report by the Secretary of JSC. (2015, 10 November), at p. 24.

92 What Are the Advantages and Disadvantages of Solar Energy? (2023, May 1). Earth.org. https://clck.ru/3SLDza

dream. The unavailability of those prerequisites for accessing the IECMS can therefore be hardly overemphasised.

In responding to that gap, the JSC established e-filing offices and internet hubs at its court stations. Those are offices equipped with computers and laptops, with adequate internet provision and manned by qualified IT personnel. Members of the public, stakeholders, and even legal practitioners may visit the hubs and offices to use the equipment therein for free, for purposes of interacting with the courts using IECMS. The e-filing offices and internet hubs provide a number of critical services to the litigating public. First, there are gadgets that one can use. Second, there is internet for connectivity to the IECMS. Third, there is electricity. Fourth, there is a qualified person who assists litigants who wish to navigate the IECMS but do not know how to do so. In one fell swoop the four challenges that are predominantly touted as being the antithesis to the successful implementation of the IECMS, that is internet, electricity, gadgets and illiteracy, are all answered and attended to. The question that one would ask however, is whether the setting up of e-filing offices at every court station is enough to address and close that implementation gap.

One may argue that the intervention whilst noble and necessary, may not be enough. Much more will need to be done in that area in order to attend to the needs of the generality of the public. It is necessary to ensure that such e-filing facilities are located and found as close to the people's homes as possible. That is so because, for provinces already under IECMS, there are still some areas or districts that do not have courts. Areas, for example, such as Mushumbi Pools, Mahuwe, Mvurwi, and Centenary in Mashonaland Central Province, Brunaperk, and Guyu in Matabeleland South Province, Dete and Kamativi in Matabeleland North Province, to mention but a few, still do not have court stations[93] and are serviced on a periodic basis. For that reason, such periodic stations do not have e-filing offices close to the people living in those communities. Even in those that have court houses in the districts, some litigants will still need to travel long distances to access the nearest courthouse. In addition to setting up court houses close to the people, the JSC would need to consider going beyond court houses when setting up e-filing offices. It may be necessary to consider setting up e-filing offices at Police stations, community information centres and even at traditional leaders' homesteads. A trajectory of that nature will ensure that e-filing offices are as close to the people as possible. It is particularly important as the JSC commences deployment of the system in the Magistrates' Courts, where the poor, the underprivileged, and vulnerable would ordinarily be found litigating. This is an observation that has also been made by other writers, who commented that for sustained gains in courts digitisation, there should be targeted front-office staffing, cascaded ICT help-desk support, and connectivity upgrades especially for remote circuits as caseloads grow. Establishing e-filing kiosks and connectivity hubs

[93] These are places that are designated circuit courts that are visited periodically by the court.

at police stations in remote areas is viable[94]. The further decentralisation of the e-filing offices therefore, must be given serious consideration.

3.3. Computer and system illiteracy

Computer illiteracy, lack of knowledge and skill to navigate through the IECMS systems are challenges that also threaten the successful implementation of the system in the courts. At the preparatory stages of launching the system, the challenges were noted. It was realised that there was a lack of computer literacy even amongst members of the Judicial Service, including judicial officers, let alone knowledge of the system itself. The JSC therefore embarked on rigorous trainings of its personnel aimed at equipping them with the basic skills and knowledge on computer usage.

The first layer of training undertaken was on IECMS capacitation. It involved knowledge and skills transfer from the service provider to the JSC technical team. It was done with the realisation that, the success of the deployment of IECMS in the courts was dependent on the JSC developing its own small group of technical experts who would not only be able to transfer knowledge to the rest of the members of staff but would also have the capacity to superintend over the maintenance and management of the technical aspects of the system. As part of the contract with Synergy International, the parties included a mandatory provision, known as the knowledge transfer provision, that required some ICT technical personnel to be trained on how to service and look after the system. There would be no need, therefore, to go back to the contractor for system maintenance[95]. That JSC technical team has become the nucleus of the IECMS implementation. The second form of training was that of system users, that is, the court officials, including judicial officers and other system users like legal practitioners, officials from the National Prosecuting Authority and Attorney General's Office, the police and prisons, National Employment Councils and other justice sector organisations[96]. Thousands of system users have so far been trained throughout the country.

The trainings were done physically when trainees would visit the Judicial Training Institute of Zimbabwe, trainers from the JSC would also visit various institutions throughout the country and train stakeholders in situ at their premises. It was also done virtually through the JSC online training platform called the Electronic Learning Management System (ELMS)[97]. The courts themselves, as they adjudicated over matters at the advent

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94 Situational Analysis and Stakeholder Feedback Report: Project SC No 300130609/Technical Assistance for Strategic Review and Development of Strategic Plan for the Judicial Service Commission, 2026-2030. IBF Impact Consortium and GGF Africa, at p. 10.

95 These were the Head of ICT Department, his two deputies and five experts now referred to as E-Courts Experts. They went for training in Armenia for six weeks at the headquarters of the service provider where the system was designed and developed. See p. 21 above.

96 See the Judicial Service Commission Annual Reports 2023 and 2024 at pp. 17–18 and 20, respectively.

97 This is a home grown JSC digital platform on which various educational courses and content is delivered to both judicial and non-judicial members.

of IECMS, were cognisant of the novelty of the system to the litigants and would at times, condone litigants where they were found on the wrong by the rules because of unfamiliarity with the system. In the case of Goromonzi Rural District Council v Nyakudya and Others[98], the Supreme Court remarked as follows:

"At the time of attempting to enter the cross-appeal, the IECMS. was relatively new. In this regard, I am of the considered view that a measure of leniency ought to be afforded to the new IECMS users who may blunder as they navigate their way through the system".

Training was also targeted at all interested persons by posting training lecture manuals, information flier and brochures, and videos, including IECMS instructional videos on JSC social media platforms such as its website, and YouTube[99]. According to a report by the secretary of JSC to the Commissioners of JSC, 51000 fliers were distributed in 2023, 57560 in 2024 and 55000 in 2025[100].

3.4. Scepticism to change

At the inception of the courts' digitisation program, there were misgivings about the system by some members of the Judicial Service who felt that this new system would unnecessarily disrupt their routine way of doing things. Others felt insecure. They believed that once the system was a success it would render them redundant and they would consequently lose their jobs[101]. Some stakeholders, like legal practitioners and civic organisations, equally did not have confidence in the system. It was felt that IECMS would affect the smooth operations of the courts and interfere with their cases. There was also the general apprehension among system users of cyber-attacks, that the system would be hacked and expose their cases and personal details to the predations of those with ill intentions.

Cognisant of those concerns, the JSC, at the inception of the implementation program, put together a change management program which was to be undertaken by a team of specially trained personnel called the change management team. The change management process was meant to manage the people's side of change from the current state of paper-based court processes to a new future state of a paperless court system and digital courts[102]. The program involved the communication of the correct message to the system users and the public on the benefits of the system and how it would enhance the administration of justice in the country, and secondly, carrying out an extensive training program that would ensure that there was a general appreciation and knowledge of the system. It was also necessary as part of the change management program to engage with

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98 S-126-22 at p. 16.

99 The foreign person owning the YouTube informational resource violates the legislation of the Russian Federation.

100 Note 87 at pp. 31 and 32.

101 See Judicial Service Commission Annual Report 2023 at p. 35.

102 The change management program was informed and guided by a document called "Integrated Electronic Case Management System, Change Management Recommendations, RFP No. JSC/ICT01/2020, published by Synergy International, 11 May 2021.

members of the Judicial Service, firstly to demonstrate to them that the system would make their work a lot easier and more efficient, and secondly that none of them was going to lose his or her employment because of the introduction of the system[103]. It was crucial that the JSC secured the buy-in of its members of staff, if the system implementation was going to succeed. It is them who would bridge the gap between the system, its users, and the public. The successful implementation of the system was heavily dependent on the positive attitude of the membership of the Judicial Service.

As part of the change management program, it was also important to engage and reassure the citizenry of the security features embedded into the system and others put in place outside the system to ensure that it was protected from hacking and other possible cyber-attacks that would put its security and information contained therein in jeopardy. Change management, therefore became and still is a critical component of the implementation matrix in the deployment of IECMS in the Judiciary in Zimbabwe. The deployment of IECMS to the courts could only succeed if all the players accepted and believed in it. That in turn could only happen if the correct message was disseminated to all the important role players. The successful carrying out of the change management program was therefore the answer to deal with the challenge of scepticism about the system by members of the JSC and other system users. A lot of promotional material was put together for hundreds of publicity campaigns that were and are still being carried out throughout the country[104]. The JSC believes that change management should not be an event which is carried out once, but a long and drawn-out process that demands patience from the project implementers. It is a process which takes various forms, and involves a continuous engagement with all stakeholders with the same consistent message on the benefits of the system. It becomes even more fundamental in light of the phased-out methodology adopted by the organisation. Every time the implementation moves to a new province, it is important that the communication lines are open and fully utilised.

3.5. Stakeholder uptake

Whilst the judiciary is now in the process of finalising its full digitisation, the situation is different with other justice sector stakeholders. They are yet to be digitised. That obviously impacts on the integration process. The full potential of IECMS can only be realised if and when all the players in the justice delivery system have digitised. With the advantages of digitisation clearly laid out in this paper[105], one cannot overemphasise the importance

[103] The recommendations on change management were meant to support the JSC in the planning, execution, and roll-out of the IECMS.

[104] 4500 caps, and 3000 t-shirts were distributed in 2023, 5000 caps, and 2160 t-shirts in 2024, and 4518 caps and 5333 t-shirts in 2025. See (Djuraev et al., 2025).

[105] See also comments by Poshai and Vyas-Doorgapersad (2023), they stated that the IECMS in Zimbabwe encompasses increased efficiency, enhanced accessibility, and modernized judiciary operations. See also Malaba L. (2022). Digital Transformation of Judiciaries in Africa and Experiences in the Face of COVOD-19 Pandemic. Chief Justice of Zimbabwe. https://clck.ru/3Eufbq

of all the players in the justice sector digitising. Pleasantly, the process of digitisation of other players has however since commenced. The Government of Zimbabwe as part of its implementation of an economic blue print termed National Development Strategy (NDS 1 2021-2025), which is aimed at working towards a prosperous and empowered upper middle-class society by 2030, has targeted the improvement of the service delivery in the justice delivery sector through the implementation of an Integrated Electronic Case Management System for all the players in that sector[106]. It is imperative that the process be expedited to enable the citizenry that would seek to interact with the justice system, enjoy the benefits of efficiency and transparency brought about by the justice sector digitisation.

Conclusion

The digitisation of Zimbabwe's court system has redefined the administration of justice in the jurisdiction. The changes that the IECMS has brought to the administration of justice landscape will remain indelible in the history of Zimbabwean courts for generations to come if not for eternity. It has modernised the running of the courts and the adjudication of disputes. The biggest advantage is that it is a system which can continue to be fine-tuned in order to keep abreast of the rapidly changing technological advancements. The system has demonstrated that it can bring substantial benefits in operational efficiency, transparency, and access to justice across all levels of the court system. Although its successful deployment has required significant investment in infrastructure, equipment, human capital, training, and public awareness it has also shown that it can be sustainable going forward. The judiciary's commitment to comprehensive capacity building and stakeholder engagement has been instrumental in overcoming implementation challenges and achieving broad system adoption. Legislative alignment was and remains critical to providing an essential legal basis for electronic procedures. Clearly there is need to continue exploring technological innovations such as Artificial Intelligence (AI) and virtual hearing capabilities which have positioned Zimbabwe's judiciary at the forefront of the digital justice space in the region. As implementation of Phase 4 progresses towards completion with the upcoming rollouts in the remaining provinces, the foundation has been firmly established for a fully digitized national court system. The experience gained from both the successes and challenges; and the best practices developed during this journey place the Judicial Service Commission in a prime position to continue its hegemony in judicial innovation and administration while ensuring that technological advancement serves the fundamental objective of delivering accessible, efficient, and transparent justice to all Zimbabweans.

[106] See Requirements Specification Document for the Design, Development, And Deployment of a Whole Government Integrated Electronic Case Management System, Version 1.0, issued by the Government of Zimbabwe, Office of the President and Cabinet.

References

Alekseevskaya, E. I. (2020). Terms of use of judicial acts for machine learning (analysis of some judicial decisions on the protection of property rights). *Law Enforcement Review*, *4*(4), 102–114. https://doi.org/10.24147/2542-1514.2020.4(4).102-114

Boldyrev, V. A., & Maksimov, V. A. (2025). Freedom of contract: The evolution of a legal principle in the era of information. Law Enforcement Review, *9*(2), 118–129. https://doi.org/10.52468/2542-1514.2025.9(2).118-129

Chynoweth, P. (2008). Legal research. In A. Knight & L. Ruddock, Eds., *Advanced Research Methods in the Built Environment* (pp. 28–38). Wiley-Blackwell.

Djuraev, I., Baratov, A., Khujayev, S., Yakubova, I., Rakhmonova, M., Mukumov, B., & Abdurakhmanova, N. (2025). The impact of digitization on legal systems in developing countries. *Qubahan Academic Journal*, *5*(1). https://doi.org/10.48161/qaj.v5n1a1246

Gaffar, H. (2024). Implications of Digitalization and AI in the Justice System: A Glance at the Socio-legal Angle. *Law and World*, *10*(31), 154-177. https://doi.org/10.36475/10.3.14

Gómez, M. A. (2024). The digitalization of litigation: International development perspectives. *Emory International Law Review*, *38*(4), 819.

Grudtsina, L. Yu. (2025). Digitalization of Justice in the United States: Case Management Electronic Case Files (CMECF) and Public Access to Court Electronic Records (PACER). *International Journal of Multidisciplinary Research and Analysis*, *8*(4), 1551–1556. https://doi.org/10.47191/ijmra/v8-i04-10

Helberger, N., & Felzmann, H. (2025). The rise of technology courts, or the digitization of justice. *Computer Law & Security Review*, *55*, Article 100013.

Krupina, G., Safiullin, N., Faizrakhmanov, D., & Kurakova, C. (2020). Main directions of popularization of electronic state and municipal services among the rural population. *BIO Web of Conferences*, *27*, 00088. EDP Sciences.

Luo, Y. (2024). The Development of Online Courts in The Digital Age and The Prospect of Future Justice: Based on The Innovation of Judicial Methods in China and The United Kingdom. *Journal of Education, Humanities and Social Sciences*, *42*, 435-440. https://doi.org/10.54097/gzn7k140

Mabhodha, S., & Choga, F. (2021). The impact of information communication technology (ICT) on procurement processes: Case of Zimbabwean urban councils (2009 to 2018). *Open Journal for Information Technology*, *4*(1), 25–34. https://doi.org/10.32591/coas.ojit.0401.03025m

Maroz, R. (2023). *Digitizing court systems: Benefits and limitations*. World Bank Justice and Rule of Law Series.

Muparadzi, T., & Mukonza, R. M. (2024). Prospects for implementing digital technologies in the administration of justice in Zimbabwe. *Journal of Digital Technologies and Law*, *2*(4), 802–834. https://doi.org/10.21202/jdtl.2024.40

Poshai, L. & Vyas-Doorgapersad, S. (2023). Digital justice delivery in Zimbabwe: Integrated Electronic Case Management System adoption. *South African Journal of Information Management*, *25*(1). https://doi.org/10.4102/sajim.v25i1.1695

Reen, M. S., & Verma, A. (2023). The pillars of democracy: Unraveling the judiciary's contribution. *Indian Journal of Law and Legal Research, 5*(5).

Reiling, D., & Contini, F. (2022). E-Justice platforms: Challenges for judicial governance. *International Journal for Court Administration*, *13*(1), Article 6. https://doi.org/10.36745/ijca.445

Rusakova, E. P., & Frolova, E. E. (2022). Digital disputes in the new legal reality. *RUDN Journal of Law*, *26*(3), 695–704. https://doi.org/10.22363/2313-2337-2022-26-3-695-704

Sourdin, T., & Weller, K. (2025). *Digitalization and artificial intelligence in courts: Opportunities and challenges*. Oxford University Press.

Stepanov, O. A., Pechegin, D. A., & Diakonova, M. O. (2021). Towards the issue of digitalization of judicial activities Law. *Journal of the Higher School of Economics*, *5*, 4–23. (In Russ.). https://doi.org/10.17323/2072-8166.2021.5.4.23

Wallace, J. C. (2001). An essay on independence of the judiciary: Independence from what and why. *NYU Annual Survey of American Law*, *58*, 241.

Wang, G., & Chen, Y. (2022). Enabling legal risk management model for international corporation with deep learning and self data mining [Retracted]. *Computational Intelligence and Neuroscience*, *2022*, Article 6385404. https://doi.org/10.1155/2022/6385404

Author information

Walter Tambudzai Chikwana – PhD, Secretary to the Judicial Service Commission of Zimbabwe;
Address: 161 Josiah Chinamano Avenue, JSC House, Harare, Zimbabwe
E-mail: secretary@jsc.org.zw
ORCID ID: https://orcid.org/0009-0009-7596-7826

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Цифровизация правосудия в Зимбабве: институциональные вызовы и практические решения

Уолтер Тамбудзаи Чиквана

Комиссия по судебной службе Зимбабве, Хараре, Зимбабве

Ключевые слова

виртуальные слушания,
доступ к правосудию,
кибербезопасность,
межведомственное взаимодействие,
право,
судопроизводство,
цифровая грамотность,
цифровые технологии,
электронная подача документов,
электронное правосудие

Аннотация

Цель: исследовать процесс внедрения интегрированной электронной системы ведения дел в судебной системе Зимбабве, выявить ключевые проблемы, достигнутые результаты и извлеченные уроки для укрепления доступа к правосудию и эффективности судопроизводства.

Методы: исследование выполнено в жанре прикладного доктринально-правового анализа с описательным подходом к поэтапной реализации интегрированной электронной системы ведения дел; использованы методы изучения законодательства, анализа технической архитектуры системы, интеграции заинтересованных сторон и операционных воздействий, а также системный обзор внутренних отчетов Комиссии по судебной службе Зимбабве, журналов запросов службы поддержки, статистики регистрации пользователей и эмпирических наблюдений за этапами внедрения и программой управления изменениями.

Результаты: внедрение интегрированной электронной системы ведения дел автоматизировало полный цикл судебного процесса – от электронной подачи документов до исполнения решений и апелляций – и обеспечило заметное повышение прозрачности и подотчетности посредством онлайн-отслеживания дел и журналов аудита; зафиксирован рост показателей рассмотрения дел в высших инстанциях и существенное сокращение накопленных дел; внедрены механизмы онлайн-регистрации, виртуальных слушаний, электронных подписей и онлайн-платежей; одновременно выявлены системные препятствия – нестабильность электроснабжения, ограниченный доступ к Интернету в отдаленных районах, дефицит устройств и уровень цифровой грамотности, языковые барьеры и опасения по поводу кибербезопасности.

Научная новизна: представлен всесторонний эмпирический анализ национальной цифровизации судопроизводства в Зимбабве, который

демонстрирует взаимосвязь между технологическими преобразованиями и институциональными параметрами независимости, подотчетности и доступа к правосудию; обоснована роль поэтапной стратегии и программ управления изменениями как условий устойчивой цифровой трансформации судебной системы.

Практическая значимость: результаты исследования дают прикладные рекомендации для администраторов судов и политиков: предпочтение поэтапного внедрения, усиление инфраструктурной поддержки и центров электронной регистрации, масштабные программы обучения, усиление кибербезопасности и законодательная гармонизация для обеспечения инклюзивного, надежного и устойчивого развития электронного правосудия.

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Список литературы

Alekseevskaya, E. I. (2020). Terms of use of judicial acts for machine learning (analysis of some judicial decisions on the protection of property rights). *Law Enforcement Review*, *4*(4), 102–114. https://doi.org/10.24147/2542-1514.2020.4(4).102-114

Boldyrev, V. A., & Maksimov, V. A. (2025). Freedom of contract: The evolution of a legal principle in the era of information. Law Enforcement Review, *9*(2), 118–129. https://doi.org/10.52468/2542-1514.2025.9(2).118-129

Chynoweth, P. (2008). Legal research. In A. Knight & L. Ruddock, Eds., *Advanced Research Methods in the Built Environment* (pp. 28–38). Wiley-Blackwell.

Djuraev, I., Baratov, A., Khujayev, S., Yakubova, I., Rakhmonova, M., Mukumov, B., & Abdurakhmanova, N. (2025). The impact of digitization on legal systems in developing countries. *Qubahan Academic Journal*, *5*(1). https://doi.org/10.48161/qaj.v5n1a1246

Gaffar, H. (2024). Implications of Digitalization and AI in the Justice System: A Glance at the Socio-legal Angle. *Law and World*, *10*(31), 154-177. https://doi.org/10.36475/10.3.14

Gómez, M. A. (2024). The digitalization of litigation: International development perspectives. *Emory International Law Review*, *38*(4), 819.

Grudtsina, L. Yu. (2025). Digitalization of Justice in the United States: Case Management Electronic Case Files (CMECF) and Public Access to Court Electronic Records (PACER). *International Journal of Multidisciplinary Research and Analysis*, *8*(4), 1551–1556. https://doi.org/10.47191/ijmra/v8-i04-10

Helberger, N., & Felzmann, H. (2025). The rise of technology courts, or the digitization of justice. *Computer Law & Security Review*, *55*, Article 100013.

Krupina, G., Safiullin, N., Faizrakhmanov, D., & Kurakova, C. (2020). Main directions of popularization of electronic state and municipal services among the rural population. *BIO Web of Conferences*, *27*, 00088. EDP Sciences.

Luo, Y. (2024). The Development of Online Courts in The Digital Age and The Prospect of Future Justice: Based on The Innovation of Judicial Methods in China and The United Kingdom. *Journal of Education, Humanities and Social Sciences*, *42*, 435-440. https://doi.org/10.54097/gzn7k140

Mabhodha, S., & Choga, F. (2021). The impact of information communication technology (ICT) on procurement processes: Case of Zimbabwean urban councils (2009 to 2018). *Open Journal for Information Technology*, *4*(1), 25–34. https://doi.org/10.32591/coas.ojit.0401.03025m

Maroz, R. (2023). *Digitizing court systems: Benefits and limitations*. World Bank Justice and Rule of Law Series.

Muparadzi, T., & Mukonza, R. M. (2024). Prospects for implementing digital technologies in the administration of justice in Zimbabwe. *Journal of Digital Technologies and Law*, *2*(4), 802–834. https://doi.org/10.21202/jdtl.2024.40

Poshai, L. & Vyas-Doorgapersad, S. (2023). Digital justice delivery in Zimbabwe: Integrated Electronic Case Management System adoption. *South African Journal of Information Management*, *25*(1). https://doi.org/10.4102/sajim.v25i1.1695

Reen, M. S., & Verma, A. (2023). The pillars of democracy: Unraveling the judiciary's contribution. *Indian Journal of Law and Legal Research, 5*(5).

Reiling, D., & Contini, F. (2022). E-Justice platforms: Challenges for judicial governance. *International Journal for Court Administration*, *13*(1), Article 6. https://doi.org/10.36745/ijca.445

Rusakova, E. P., & Frolova, E. E. (2022). Digital disputes in the new legal reality. *RUDN Journal of Law*, *26*(3), 695–704. https://doi.org/10.22363/2313-2337-2022-26-3-695-704

Sourdin, T., & Weller, K. (2025). *Digitalization and artificial intelligence in courts: Opportunities and challenges*. Oxford University Press.

Stepanov, O. A., Pechegin, D. A., & Diakonova, M. O. (2021). Towards the issue of digitalization of judicial activities Law. *Journal of the Higher School of Economics*, *5*, 4–23. (In Russ.). https://doi.org/10.17323/2072-8166.2021.5.4.23

Wallace, J. C. (2001). An essay on independence of the judiciary: Independence from what and why. *NYU Annual Survey of American Law*, *58*, 241.

Wang, G., & Chen, Y. (2022). Enabling legal risk management model for international corporation with deep learning and self data mining [Retracted]. *Computational Intelligence and Neuroscience*, *2022*, Article 6385404. https://doi.org/10.1155/2022/6385404

Сведения об авторе

Чиквана Уолтер Тамбудзаи – PhD, секретарь Комиссии по судебной службе Зимбабве
Адрес: Зимбабве, г. Хараре, Джосайя Чинамано авеню, 161, здание Комиссии по судебной службе
E-mail: secretary@jsc.org.zw
ORCID ID: https://orcid.org/0009-0009-7596-7826

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Online Dispute Resolution in the Field of Consumer Protection in India

Dr. Solomon Girma Taddesse ✉
Madda Walabu University, Robe, Ethiopia

Vidhyanshi Bhanwar
National Law Institute University, Bhopal, India

Shruti Verma
National Law Institute University, Bhopal, India

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Abstract

Objective: to explore the advantages, challenges and implications of integrating technologies, particularly online dispute resolution, into the dispute resolution system in India, with a particular focus on consumer protection disputes.

Methods: the authors use general scientific methods of analysis and synthesis, as well as systematic, functional and comparative-legal approaches to systematically study the concept of online dispute resolution, its historical evolution and practical application with an emphasis on mediation procedures. The work is based on a doctrinal, qualitative approach with an analysis of current legislation, consumer protection standards, and the practice of judicial systems.

Results: The results obtained indicate that online technologies significantly increase the efficiency and accessibility of dispute resolution. However, in India, their development faces serious obstacles, including the technical illiteracy of the population, the digital divide, concerns about the security and confidentiality of personal data, and the lack of clear regulatory legal documents. These restrictions hinder equal access to justice and highlight the need to develop comprehensive public policies and improve digital infrastructure. The work revealed a complementary role of artificial intelligence, electronic mediation and blockchain technology in ensuring fair and effective resolution of consumer disputes.

✉ Corresponding author

Scientific novelty: it consists in a comprehensive review of the role of online dispute resolution within the Indian consumer protection system, taking into account modern technological transformations. The authors identify technological, legal and ethical issues that arise in this process and offer a vision of how digital transformation affects the administration of justice in the field of consumer protection.

Practical significance: The study highlights the critical importance of strengthening digital infrastructure, increasing the level of digital and legal literacy of the population, and creating legislation to support the effective implementation of online dispute resolution in the Indian justice system. The work contains suggestions and recommendations for public and judicial authorities, technology developers and all stakeholders involved in the integration of digital tools into resolving consumer disputes, while ensuring fairness, inclusiveness and equal access for all participants in legal relations.

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Contents

Introduction

The concept of access to justice has evolved with growing pervasiveness of technology increasing the demand for greater access to fair and efficient means to legal remedies (Schmitz, 2019). Traditional litigation, which requires the physical presence of the parties to a case in the court of law is no longer the sole means of accessing justice. It is a barrier in terms of its cost-effectiveness, time-consumption, and accessibility for many including the marginalized communities of the society. The challenge is also reflected in matters of consumer disputes where sometimes, the cost of litigation

exceeds the value of disputed goods or services, in turn discouraging the consumer from seeking justice.

In India, the main document that gives the first room to ADR mechanisms to procure and protect the rights of consumers is the Constitution of India. Article 19(1)(g) of Constitution procures the interests of business entities whereas the right of consumers emanating from the right against exploitation is constructively interpreted under Article 21 right to life under the Constitution. Parties to the dispute can interpretatively demand the clause of confidentiality and make the parties abide by the procedure established by law. Similarly, it provides due regard to the principles of natural justice which envisages the right to be heard and represented as well as to demand impartiality, accountability, and transparency while opting for dispute resolution. The same constitutional ideals also have the potential to push and bind the government to provide ease in this kind of mechanism for better access to justice and to extend the facility of free legal aid to forward the same. Similarly, Section 89 of the 1860 Civil Procedure Code Arbitration and Conciliation Act has recognized mediation and arbitration as respectively.

Online Dispute Resolution is an extension of Alternate Dispute Resolution which aims at covering the dispute resolution of the area broadened by virtue of growing technology and the internet arena (Katsh & Rifkin, 2001). ODR can be accessed just by a meeting or connection made through the internet or technology within the comforts of one's home, office, or any place of one's choice at the time mutually agreed upon[1].

ADR is more cost-efficient and less time-consuming as compared to the traditional litigation of courts (WIPO, n.d.). The advantages of ODR are similar to that of ADR but with an added benefit of its relevance and need in the digital world. An important advantage of the process of ODR would be that if needed meetings can be confidential but, if necessary, with the mutual agreement of parties, all the meetings pertaining to a dispute resolution being conducted online can be recorded for future evidence. The ease of technique of dispute resolution may vary depending upon the nature of a dispute and the comfort of the parties.

Globalization has led to the expansion of consumerism, especially with the rise of cross-border e-commerce transactions, ODR has become the need of the hour to remain a step ahead in not just procuring the ethics of market and rights of the consumer but also for the accessibility of justice. NITI Aayog has also pushed for the adoption of ODR to take the lead in different areas[2]. As per the UN Commission on International Trade Law[3], an ODR procedure could be especially helpful for disagreements resulting from

1 Government of Canada, Department of Justice, Electronic Communications. (2022, August 25). Dispute Resolution Reference Guide: Online Dispute Resolution. https://goo.su/Fvozf

2 The NITI Aayog Expert Committee on OPC. (2021). Designing the future of dispute resolution: The OPC policy plan for India. NITI Aayog. https://goo.su/8WTpLpL

3 UNCITRAL. (2017). Technical notes on online dispute resolution. https://clck.ru/3RrNk3

low-value, cross-border e-commercial transactions. Disputes resulting from business-to-business and business-to-consumer transactions may be handled more efficiently through an ODR process.

According to the UN Consumer Protection Guidelines, the right to access justice, the existence of effective redress mechanisms, and the availability of dispute resolution systems are essential consumer rights[4]. Similarly, the United Nations Conference on Trade and Development (UNCTAD) Manual on Consumer Protection[5] offers comprehensive guidance on these principles. Recently, the UNCTAD Working Group published a report focusing on e-commerce and cross-border cooperation, emphasizing the increasing significance of global Online Dispute Resolution[6].

After COVID-19 pandemic and the evolution of the digital era, ADR has become not only a necessity in various disputes of a civil nature, but ODR has also become a widely adopted mechanism that protects a person from complex processes and legal jargon that has always acted as a deterrent against availing the remedy. One of the major challenges faced in consumer court matters is that they arise from the transaction between parties who are on an unequal footing. This study aims to examine the multifaceted role of ODR in consumer dispute resolution and evaluate its potential to support a more accessible and efficient justice system.

Methodology. This article uses a doctrinal, qualitative research approach to explore how Online Dispute Resolution can improve access to justice, especially in consumer cases. Because consumer disputes involve both legal principles and practical challenges, a qualitative method helps in understanding the strengths and weaknesses of ODR and how it may influence the justice system. By examining existing laws, consumer protection standards, and the functioning of the courts, the study aims to better understand the legal and theoretical issues surrounding ODR. The data collected for the research is primarily based on the review of literature and secondary data. The paper emphasis predominantly on descriptive and critical analysis of the existing legal framework and digital arena, to reflect a way forward in dispute resolution.

1. Legal Theories of Justice and Dispute Resolution

Rooted in the natural law theory's moral imperatives and positive law structured frameworks, the pursuit of access to justice evolves with technological advancement. Natural law theory, which asserts that legal norms are derived from moral principles

4 United Nations Conference on Trade and Development. (2016). Guidelines on Consumer Protection. United Nations. https://clck.ru/3RrNLu

5 United Nations Conference on Trade and Development. (2019). Manual on Consumer Protection. United Nations. https://clck.ru/3RrNBZ

6 UNCTAD. (2024, November 21). UN Trade and Development: Online dispute resolution key to boosting consumer trust. https://clck.ru/3RrNZt

inherent in human nature, raises questions about the legitimacy of ODR. Proponents of natural law might argue that justice must be administered through human engagement, emphasizing fairness and moral reasoning. However, ODR, by integrating artificial intelligence and automated decision-making, may challenge traditional notions of justice by reducing human intervention. A natural law advocate would stress the need for ODR mechanisms to incorporate ethical considerations and procedural fairness to align with fundamental moral principles.

Legal positivism emphasizes that law is a set of rules established by a recognized authority, independent of moral considerations. Only when ODR is sanctioned by legal frameworks and institutionalized norms is it a legitimate legal mechanism. The increasing inclusion of ODR in formal legal systems, such as United Nations Commission on International Trade Law[7] and various national regulations, reflects its acceptance within the positivist paradigm. However, making sure that ODR complies to procedural requirements to maintain its legitimacy within the legal system is still an issue.

The use of ODR as a practical tool to enhance efficiency is supported by legal realism, which focuses on the pragmatic implementation of law and the role of judicial discretion. Realists argue that law must be adaptable to societal needs, and ODR addresses contemporary challenges by reducing costs and expediting resolutions. However, legal realists also caution against over-reliance on technology, advocating for continuous evaluation of ODR's effectiveness in delivering just outcomes. From this perspective, ODR may be seen as a mechanism that could perpetuate existing power imbalances, especially if designed in ways that favor corporations or technologically adept parties over marginalized individuals. There is a need for framework that provides for transparency, inclusivity, and safeguards against bias in ODR processes to ensure equitable access to justice. Jurisprudential perspectives provide valuable insights into the strengths and challenges of ODR (Beyleveld & Brownsword, 1985).

This paper highlights the role of enhancing Access to Justice; thus it becomes imperative to focus on John Rawls' idea of justice as fairness promotes equitable access to justice through institutional frameworks that prioritize fairness and personal rights assuring substantive equality over mere formal access (Nagel, 1973). Amartya Sen's theory of justice in The Idea of Justice, Sen (2009), critiques traditional transcendental institutionalism, particularly John Rawls' idealized models, arguing that justice should focus on practical improvements rather than defining a perfectly just society. His capability approach, shifts the focus from resources or welfare to individuals' actual freedoms and opportunities. Unlike Rawls' institutional focus, Sen's pluralistic and pragmatic theory prioritizes eliminating real-world inequalities, making it particularly relevant for global justice and development (Boot, 2012).

[7] UNCITRAL. (2017). Technical notes on online dispute resolution.

2. Evolution and Forms of ODR in India

The Consumer Protection Act of 2019[8] marks a significant advancement in enhancing consumer rights within India, especially considering the swift expansion of digital transactions and e-commerce. By updating the legal framework and acknowledging the necessity for quicker, technology-based methods for resolving disputes, CPA 2019 established the groundwork for the creation and implementation of ODR systems in consumer-related conflicts. CPA 2019, unlike the previous act, the Consumer Protection Act[9], which focused primarily on traditional consumer grievances, established procedures such as the Central Consumer Protection Authority (CCPA), which has the authority to take suo-moto actions, recall faulty products, and impose penalties. The Act also incorporates provisions for product liability, e-commerce regulation, and simplified dispute resolution through mediation. The goals of these reforms are to improve consumer protection accessibility, efficiency, and compatibility with the evolving marketplace.

Despite these advancements, a number of obstacles hinder the full realization of the Act's goals. Since the effectiveness of CCPA and Consumer Disputes Redressal Commissions (CDRCs) is often constrained by inadequate resources, lack of awareness among consumers, and sluggish legal proceedings, enforcement remains a challenge. The cross-border nature of e-commerce complicates jurisdictional enforcement, making it challenging to regulate online transactions effectively. Although mediation offers a quicker alternative to litigation, its success depends on both parties' willingness to negotiate, which is not always the case. To enhance the Act's effectiveness, there is a need for stronger enforcement mechanisms, increased digital literacy, and continuous legal updates to keep pace with technological advancements. (Singh & Saxena, 2024).

Online Dispute Resolution (ODR) is a wide category of alternative dispute resolution procedures that capitalize on the accessibility and growing sophistication of internet technology. It is a group of conflict resolution. The use of technology in ODR employs AI to assist with automotive administrative processes, recommendations, and analyzing data patterns to predict case outcomes. Even machine learning could help in help streamline repetitive processes, making ODR an efficient option for high-volume cases like consumer disputes. Furthermore, secure file-sharing and encryption protocols are vital for protecting the confidentiality of parties involved in ODR, particularly in consumer disputes where sensitive financial and personal information is exchanged.

ODR is distinct from general technology-enabled ADR, as it actively incorporates tools such as AI and machine learning to assist in resolving disputes digital platforms.

8 The Consumer Protection Act, 2019. (2019). https://clck.ru/3RrBmF

9 Consumer Protection Act. (1986). In Consumer Protection Act. https://clck.ru/3RrBnb

E-mediation, a widely used form of ODR in regions in Europe and Asia, demonstrates its growing global relevance. In India, the NITI Aayog Expert Committee on ODR (2021) has recommended amendments to the "Insolvency and Bankruptcy Code" to formally recognize e-mediation through authorized ODR service providers. Letting parties take part in meetings online, submit documents digitally, and choose whether the process happens in person, online, or in a mixed way can make dispute resolution much easier and faster. It also helps reduce paperwork and makes the whole process more efficient.

ODR has three types i.e., Automated Negotiation, Online Arbitration, and Video Mediation. The first is Automated Negotiation- In this mediation as the name suggests, this is without any human intervention i.e. computer facilitated negotiation process. Users input information about their demands and preferences and the system employs an algorithm to suggest potential compromises between the parties. This mechanism is useful where the issue is very straightforward generally in small claims and consumer disputes. They provide quick and satisfactory outcomes making them ideal for e-commerce and customer service claims. Additionally, the Online Arbitration is another type. This is a process where the arbitrator evaluates the disputes based on the evidence that is submitted online and makes a binding decision. This is done to allow parties to submit evidence digitally, reducing time and cost, unlike traditional arbitration. It provides for parties in dispute to seek a definitive and enforceable decision without the complexities of court proceedings. Digital document submission and electronic signing make this an effective mechanism for business-to-business (B-B) and business-to-consumer (B-C) including international transactions. Finally, video mediation is a way for a neutral mediator to help people in a dispute talk to each other over a video call. It lets everyone explain their side, and the mediator guides the discussion to help them reach a solution that works for both.

3. Mediation As an Effective Tool of ODR in Consumer Disputes

Mediation as technique of dispute resolution, is more adaptable and efficient than traditional litigation, making it a desirable option. In mediation, the mediator's role is to assist the parties in reaching an agreement in a confidential and exclusive setting. The mediator's technique may differ depending on the nature of the conflict and the desired outcome, with popular approaches including facilitative, evaluative, court-mandated, and transformative mediation. As Patil explains, a mediator has several crucial tasks to ensure that the process runs smoothly and efficiently. Furthermore, the mediator must keep control of the process, direct the conversation, manage the contact between the parties, and, if necessary, assist in the writing of a written agreement once a resolution has been reached[10].

[10] Patil, A. R. (2021). Consumer handbook on mediation: Frequently asked questions. https://goo.su/Qyq9

Mediation is a mechanism where a neutral third party facilitates the negotiation to achieve an amicable settlement (Andrews, 2017). It plays a crucial role in addressing conflicts between states as well as disputes stemming from commercial and investment agreements. In this regard, the UN Charter requires states to settle disputes peacefully, adhering to the principle of abstaining from the use of force (UN Charter, Art 2 and 33). It is often used to end armed conflicts, especially for border issues, occupations, and post-conflict arrangements in international disputes (Bhuta, 2005). Whereas parties in commercial and investment disputes can resolve their dispute through institutions like UNCITRAL, ICSID, and ICC, which have mediation rules. However, these rules do not specifically address the use of technology during the mediation process.

Technology may enhance the mediation process by enabling video conferencing, online document sharing, private virtual caucuses, electronic filing, and electronic signatures, making the mechanism more efficient and accessible (Gómez, 2019). The Singapore Mediation Convention (2020), makes sure that agreements reached through mediation can be enforced. It also allows the use of electronic signatures, so technology can play a role in mediation. Other than this, there are no global rules for using technology in mediation, so each country's laws mainly decide how it can be used.

Consumer disputes can be broadly categorized into objective and subjective claims, each requiring distinct resolution mechanisms (Tan et al., 2024). Objective disputes, such as warranty claims, product defects, or breaches of guarantee, often involve quantifiable and verifiable data, making them well-suited for automated, data-driven decision-making systems (Cortés, 2017). Automated dispute resolution mechanisms, leveraging AI and rule-based algorithms, can efficiently adjudicate such matters based on predefined legal standards and contractual terms, thereby ensuring consistency and reducing resolution time (Katsh & Rabinovich-Einy, 2017).

Conversely, subjective disputes, such as deficiency in service, consumer dissatisfaction, or unfair trade practices, require a more nuanced approach involving interpretation, contextual analysis, and equitable considerations[11]. Since these disputes often require the application of judicial or quasi-judicial discretion, making E-mediation the preferred resolution mechanism (Schmitz, 2019). E-mediation, which uses technology to help parties negotiate, lets everyone share their concerns and reach a fair solution while keeping basic principles of fairness and justice (Rule, 2020). Thus, while automated ODR systems enhance efficiency in resolving objective consumer disputes,

[11] Panetta, J. (2023). AI is smart, but it can't replicate the human touch in mediation. Bloomberg Law. https://clck.ru/3RrXGC

subjective human-centric approach is reinforcing the complementary role of technology and human decision-making in consumer justice[12].

4. Why Opt For E-Mediation as Compared to Other ODR Mechanisms in Consumer Disputes?

Mediation serves as a vital tool in achieving real justice in consumer disputes by offering a more accessible, efficient, and fair resolution process. Unlike traditional litigation, which often results in a win-lose scenario, mediation fosters a collaborative approach where both parties work toward mutually acceptable solutions. Justice A. K. Sikri (2017), in his article, emphasizes that mediation is not merely a mechanism for reducing court backlog but a means of delivering a distinct form of justice, one that is more responsive, inclusive, and rehabilitative. Mediation allows disputing parties to communicate openly, comprehend each other's veiws, reach agreements that go beyond legal formalism to safeguard their underlying interests. This technique not only resolves conflicts but also rebuilds relationships, assuring long-term harmony amongst consumers and service providers.

Furthermore, mediation facilitates access to justice, particularly among economically disadvantaged individuals who may find the traditional legal system prohibitively difficult due to its complexity, costs, and delays. The adversarial nature of litigation frequently disadvantages weaker parties, while mediation provides a level playing field by promoting direct dialogue and encouraging equitable solutions. Mediation is very efficient in consumer disputes, particularly due to the mass nature of grievances, such as disputes over banking fees, online transactions, or defective products. The developing trend of e-commerce emphasizes the necessity of online mediation, enabling speedy and cost-effective resolution without regard to geographical barriers. While mediation has gained impetus worldwide, India is still working to integrate institutionalizing it within the consumer protection framework. Strengthening mediation mechanisms and promoting awareness about their benefits can ensure a more just, inclusive, and consumer-friendly dispute resolution system (Sikri, 2017).

Mediation plays a crucial role in resolving disputes by offering a more equitable and accessible alternative to traditional litigation, particularly for parties with unequal bargaining power. Unlike adversarial court proceedings, where outcomes often favor the more resourceful party, mediation fosters a collaborative process where disputing parties negotiate mutually acceptable solutions. This ensures that justice is not merely a legal resolution but a fair and sustainable outcome that restores relationships and addresses

[12] Shonk, K. (2024). AI mediation: Using AI to help mediate disputes. Program on Negotiation, Harvard Law School. https://clck.ru/3RrRsp

underlying concerns. In consumer disputes, where big companies often have more power than individual consumers, mediation lets the weaker party speak up and resolve issues without high legal costs, complicated procedures, or unfair advantages (Sourdin, 2002).

Drawing a parallel with arbitration, particularly in cases of «forced arbitration,» mediation stands out as a more just and voluntary dispute resolution mechanism[13]. Forced arbitration, as discussed in the concept of contracts of adhesion, often places the weaker party at a disadvantage, compelling them to accept unfavorable terms without meaningful negotiation. Such contracts are prevalent in consumer agreements, employment contracts, and digital transactions, where corporations impose arbitration clauses that limit access to courts, set procedural barriers, and create financial hurdles. Mediation, by contrast, does not impose such constraints; it prioritizes fairness, self-determination, and accessibility, making it a preferable alternative for ensuring justice in cases where parties have unequal bargaining power (Ijaodola, 2020).

There is a need for a client-centered approach, emphasizing mediation and unbundled legal services to empower individuals in legal disputes and consumer matters, where power imbalances often exist between large corporations and individual consumers, these principles can be instrumental. Mediation provides a platform for consumers to actively participate in resolving disputes, allowing them to voice concerns and negotiate fair settlements in an informal, cost-effective setting. This process reduces the intimidation factor posed by corporate legal teams and promotes equitable outcomes. Mosten also promotes unbundled legal services, where attorneys offer limited-scope representation. In the context of consumer disputes, this approach enables consumers to access specific legal assistance, such as preparing for mediation or understanding settlement offers, without bearing the high costs of full representation, his model addresses financial disparities and makes legal support more accessibly focusing on interest-based negotiation rather than adversarial tactics, mediation fosters solutions that meet the needs of both parties, which is particularly beneficial in ongoing consumer relationships like those between tenants and landlords or service providers and clients. Implementing Mosten's peace making strategies can thus mitigate power imbalances and lead to fairer resolutions in consumer disputes (Mosten, 2009).

The recent enactment of the Mediation Act of 2023[14] emphasizes the growing relevance of institutionalized mediation in resolving both commercial and non-commercial issues. The committee has noted, however, that the success rate of mediation remains poor[15].

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[13] PON. (2024). What are the three basic types of dispute resolution? What to know about mediation, arbitration, and litigation. Program on Negotiation, Harvard Law School. https://clck.ru/3RrYE9

[14] The Mediation Act, 2023. (2023). The Gazette of India. https://goo.su/UaMzY

[15] Viswanathan, T. K., Shukla, S., Mani, R., Shroff, S. S., Batra, S., Roul, S., & Shukla, S. K. (2024). Framework for use of mediation under the insolvency and bankruptcy code, 2016. Insolvency and Bankruptcy Board of India. https://goo.su/njkVBeV

One contributing reason is the lack of a comprehensive infrastructure for the training and growth of professional mediators, which contributes to parties' reluctance to participate in mediation. Furthermore, there is an urgent need for a cultural shift to promote trust in the mediation process. Building trust is critical for enabling parties to accept mediation as a legitimate and successful method of dispute resolution. This cultural shift will necessitate not just institutional backing, but also a determined effort to illustrate the long-term benefits of mediation in promoting mutually beneficial results.

For example, in Bangalore, only 4.3 % of newly filed cases. around 31,441 between 2011 and 2015, were referred to the Bangalore Mediation Center, showing how rarely mediation is used (Bangalore Mediation Center, 2015). The Delhi High Court and Conciliation Center referred only about 13 646 cases for mediation which is nearly 2.66% of all the cases before the court. As for Allahabad Court Mediation and Conciliation Centre, the freshly instituted cases were 0.85 % which is about 11,618 cases in 2011-2015[16].

Pearson examines the effectiveness of mediation and arbitration as alternatives to litigation. The study reviews various programs and finds that while mediation does not always significantly reduce court congestion or public costs, it consistently yields high user satisfaction, better compliance with agreements, and reduced relitigation rates. Pearson highlights that mediation provides a more informal, cooperative setting that allows parties to resolve disputes amicably, focusing on mutual understanding rather than adversarial confrontation. This approach is particularly effective in cases where maintaining relationships is crucial, such as family disputes and small claims matters. The research also notes that mandatory mediation and arbitration programs tend to be more successful than voluntary ones in reducing court backlogs and encouraging participation. Mediated agreements are generally more durable because parties are more likely to comply with settlements they voluntarily negotiate. However, the study acknowledges that mediation cannot always resolve deep-rooted conflicts and may not be effective in all legal contexts. Overall, Pearson concludes that mediation serves as a valuable complement to formal adjudication, offering a more humane and effective resolution method for many disputes (Pearson, 1982).

5. The Role of Technology and Artificial Intelligence in the Development of ODR

One of the major challenges faced in consumer court matters is that they arise from the transaction between parties who are on an unequal footing. With technology, the market for competition and disputes thereto, over quality, performance, and delivery of goods and services over online shopping have increased along with the cross-jurisdiction matters. Traditional litigation has become redundant to address the jurisdictional issue. The major

[16] Kumar, A. P., Jauhar, A., Vohra, K., & Tripathi, I. (2016). Strengthening Mediation in India. Vidhi Centre for Legal Policy. https://clck.ru/3RrWiu

elements of technology opened the gateway to dispute resolution, as technology has overcome the geographical, financial, and temporal barriers providing a promising solution to cross-border disputes.

ODR mechanism has seen a significant enhancement in effectiveness, case management, documentation, and analytics. It has made dispute resolution more accessible and manageable for the user and administrators alike. Case Management and documentation done through AI-driven management systems can help to handle high volumes of disputes efficiently by organization, categorization, and tracking of cases. It would provide for collection, and storage of case-related information and ensure that parties have access to relevant documents. Streamlining of documentation by using natural processing language can help to summarize and analyze documents reducing the burden on the mediators and arbitrators.

Technology can further provide predictive analytics and decision support that can help the ODR system approach decision-making and outcome prediction which can help the parties make informed decisions on whether to pursue resolution. This mechanism is particularly useful in automated negotiation and arbitration models where the algorithm can learn from case history to make suggestions based on similar resolved cases. Decision support tools can provide data-driven insights that can be used to support fair and transparent decisions. Further, the technology can provide Chatbots and Automated Assistance where ODR platforms can provide real-time guidance, provide frequently asked questions (FAQ), and provide case updates. These tools may communicate with users in natural language and guide them through the resolution process, thus reducing human dependency. Their importance can significantly be pronounced dealing with common, low-complex queries, allowing human mediators and arbitrators to focus on complex cases.

Emerging technologies like blockchain, artificial intelligence (AI), and chatbots (Amin, 2024) have had a significant impact on the evolution of Online Dispute Resolution (ODR). These innovations have transformed consumer protection procedures, enhancing efficiency, accessibility, and trust in digital dispute resolution. Blockchain technology, for example, provides a decentralized and immutable ledger for recording transactions and dispute resolutions, assuring transparency and minimizing fraud (Linden, 2019). Smart contracts improve ODR by automating settlements based on established criteria. The Kleros protocol, a blockchain-based arbitration system, shows how decentralized decision-making can be used in disputes, using economic incentives to promote fair judgment[17]. However, blockchain confronts legislative hurdles, security concerns, and technical complexity, limiting its broad use adoption in ODR systems.

Artificial intelligence has also transformed ODR by automating case management, predictive analytics, and document analysis. AI-driven language translation and natural

[17] Jain, S. (2024). Blockchain empowered online dispute resolution: A decentralized approach to enhancing trust and efficiency. Live Law. https://clck.ru/3RrWRt

language processing (NLP) break down linguistic barriers, allowing cross-border dispute settlement. Machine learning models can also assess past conflict outcomes to predict potential resolutions, which aids mediators and decision-makers. Case studies such as AI-powered consumer complaint platforms have demonstrated increased efficiency in addressing large volumes of cases. However, concerns regarding algorithmic bias, data privacy, and the necessity for human oversight remain major roadblocks. Ethical considerations, such as fairness in automated decision-making, necessitate the ongoing refining of AI models to ensure fair dispute resolution.

Chatbots have developed as an important tool in ODR since the provide real-time assistance to consumers navigating dispute resolution processes. These AI-powered virtual assistants can categorize complaints, provide legal guidance, and automate responses, easing the burden on human mediators. Consumer protection organizations are increasingly looking into chatbot integration to expedite their services. However, issues such as the inability to answer complicated legal queries, potential inaccuracies in automated responses, and lack of human empathy in sensitive disputes underscore the need for a hybrid approach in which chatbots supplement rather than completely replace human mediators. Initiatives like incorporating OpenAI's ChatGPT into ODR platforms highlight the potential of chatbots in improving user experience and accessibility (Barnett & Treleaven, 2018).

Despite these technologies' transformational there are still challenges remain in their implementation. Many countries lack the necessary legal framework, technological competence, and financial resources to develop cutting-edge ODR systems. To combat this, multinational collaborations, such as UNCTAD's projects, advocate for open-source ODR platforms that can be tailored to regional needs. By leveraging blockchain for transparency, AI for intelligent decision-making, and chatbots for accessibility, the future of ODR holds enormous potential in delivering impartial and efficient digital justice[18].

Traditional online mediation methods face major challenges, including enforceability issues, trust deficits, and reliance on centralized authorities. Whereas major change is the use of blockchain in e-mediation, which makes dispute resolution more secure, transparent, and easier to enforce. With its decentralized and unchangeable ledger, blockchain ensures that agreements reached during mediation are recorded transparently and securely, eradicating concerns about document tampering or manipulation[19].

[18] UNCTAD. (2024, November 21). UN Trade and Development: Online dispute resolution key to boosting consumer trust. https://clck.ru/3RrNZt

[19] Cianci, M., Longo, A., Ward, D., & Iwry, J. (n.d.). Litigation, professional perspective – Benefits & risks of decentralized dispute resolution. Bloomberg Law. https://clck.ru/3RrWLu

Furthermore, smart contracts, a crucial component of blockchain technology ensure compliance by automating the execution of mediation agreements without the need for external enforcement tools. This automation fosters efficiency, reduces the risk of non-compliance, and eliminates the need for intermediaries, thus significantly reducing processing time and mediation expenses (Ast & Deffains, 2021).

ODR has been incorporated into the legal systems of several nations, especially in small claims, consumer, and business disputes. CyberSettle (USA), SquareTrade, Modria (USA) – Developed in collaboration with the American Arbitration Association (AAA), it offers a multi-stage resolution process, handling complex disputes, including e-commerce and property disputes, Small Claims Mediation Scheme (UK) – A government-backed initiative offering one-hour phone mediation for small claims, reducing court congestion, MoneyClaim Online (UK) – Designed for borrower-lender disputes, it facilitates claims up to £100,000, improving efficiency in financial dispute resolution, Mediation.RF (Russia) – Focused on family disputes and divorce mediation, this system automates negotiation processes to speed up settlements, e.Dogovor.ru (Russia)– A commercial dispute resolution platform ensuring secure and systematic online arbitration for business conflicts. These platforms highlight the global shift toward technology-driven dispute resolution, streamlining legal processes while reducing costs and delays (Kavita, 2023).

The move of mediations to an online platform has greatly reduced travel time and associated costs. Furthermore, the elimination of travel constraints has made arranging mediations easier, which would have been logistically difficult in the past. However, despite its various benefits, online mediation has several negatives, the most noteworthy of which is a decreased ability to comprehend nonverbal communication (Martin, 2021).

India's ODR implementation strategy takes two steps: first, it strengthens current ADR laws with ODR-specific reforms, such as those pertaining to digital notarization, mediation laws, data privacy, and required pre-litigation mediation in some situations. The second is the introduction of optional rules for ODR service providers. A progressive deployment is advised, with a focus on a simple, self-regulating approach at first. If necessary, this model can develop into more stringent control. This framework covers the possible advancement of institutional accreditation and auditing procedures in the future. The ultimate objective is to use technology-enabled conflict resolution to realize the constitutional promise of accessible, reasonably priced justice[20].

[20] The NITI Aayog Expert Committee on OPC. (2021). Designing the future of dispute resolution: The OPC policy plan for India. NITI Aayog. https://goo.su/8WTpLpL

In 2005, the Supreme Court of India formed an E-committee to integrate technology into the judiciary, marking the beginning of ODR development in India. Despite a delayed start, several noteworthy initiatives followed, including the establishment of E-ADR in 2019, the SAMADHAAN platform for MSME payment disputes in 2018, the Digital India campaign in 2015, and the Online Consumer Mediation Centre in 2016[21]. The VIVAAD SE VISHWAS system (2020) for tax disputes was the result of the COVID-19 epidemic, which expedited the use of ODR. By introducing «The ODR Policy Plan for India» in 2021 with the help of organizations like the RBI and SEBI, NITI Aayog played a significant role. Under the leadership of Justice (Retd) A.K. Sikri, a high-level group was established to advance ODR with an emphasis on data-driven development for conflict resolution and legal health[22].

To improve consumer protection and grievance redress, the Department of Consumer Affairs has put in place several important measures. In 2005, the National Consumer Helpline (NCH) was established. In 2016, the Integrated Consumer Grievance Redressal Mechanism (INGRAM) was introduced, offering a direct channel for consumer complaints and voluntary collaborations with businesses. The agency also introduced the Consumer Protection (E-commerce) Rules, 2020, and created a consumer app for simple complaint submission. Consumer rights laws were reinforced by the Consumer Protection Act of 2019[23]. The E-Daakhil portal, which enables electronic complaint submission and expedites the dispute resolution process through enhanced ICT integration in the Consumer Disputes Redressal Commission, was a noteworthy technological advancement. (Centre Launches E-Daakhil Across All States and Union Territories of India, n.d.)[24]. CORD and SAMA are two prominent Online Dispute Resolution (ODR) platforms in India that offer effective and accessible digital solutions for resolving disputes i.e., SAMA and CORD.

Sama, originally launched as a mediation platform in 2015, has been expanded to a comprehensive ODR service for integrated arbitration, conciliation, and mediation. It follows well defined procedural guidelines, ensuring streamlined case resolution under stringent deadlines. Notably, Sama has collaborated with different State Legal Services Authorities to enable online Lok Adalats, effectively settling a large volume of cases with sizeable monetary settlements. The platform's broad acceptance across cities and languages, positioning it as a viable alternative to traditional litigation while enhancing access to justice. Sama has around 2 crore disputes filed and out of which 34 lakhs were resolved on Sama and the average resolution time is 45 days. It provides for OCR-based

21 Gaur, R. (2024). Tech-driven justice: Unraveling the dynamics of online dispute resolution. Live Law. https://clck.ru/3Rrae7

22 Ibid.

23 The Consumer Protection Act, 2019. (2019). https://clck.ru/3RrBmF

24 Centre launches E-Daakhil across all states and union territories of India. (n.d.). https://goo.su/wk287gx

Evidence review, document led case filing, detailed insights across cases and transcription support. There is a secure and trusted platform and panel based appointed of mediators across 500 districts in India. Through Sama, individuals can get consultation from a highly qualified subject matter experts, and if the matter is appropriate for ODR it will be filed on Sama for online mediation. Online mediation Pilot project Report for online mediation in criminal compoundable cases was conducted in Jabalpur, Bhopal and Gwalior through women help desk setup in collaboration with MP State Legal Services Authority and Police authority. The same could be applied in the cases of consumer disputes[25].

Centre for Online Resolution of Disputes (CORD) provides a secure digital environment for dispute resolution through arbitration and mediation. Both Sama and CORD exemplify the growing acceptance of ODR in India, demonstrating its potential to alleviate the burden on courts while fostering a more accessible and technology-driven legal ecosystem (Gupta & Bajpai, 2023). The rapid digitization of India, particularly under the Digital India Programme, has raised critical concerns about data privacy and the digital divide, which have direct implications for ODR and mediation[26]. As legal processes move online, personal data can be at risk due to weak data protection laws. The Information Technology (Amendment) Act, 2008, covers some cybersecurity issues but does not fully protect personal data in online dispute resolution (ODR) or mediation. As mediation requires the exchange of confidential information, the lack of explicit privacy safeguards can undermine confidence in digital dispute resolution. In addition, India's digital divide, marked by differences in access to the internet, digital literacy, and technological infrastructure, creates barriers to fair and accessible ODR mechanisms. Those in rural areas or from lower socio-economic backgrounds may struggle to use digital mediation platforms, which would exacerbate already-existing disparities in access to justice (Ghosh, 2020).

To combat these challenges, India must enact stronger data protection regulations aligned with global best practices while also bridging the digital divide to make ODR and mediation available to all citizens. A dedicated regulatory body for data protection, as suggested by legal experts, could enhance digital trust and security. Additionally, investment in digital literacy and infrastructure would ensure that marginalized populations can benefit from ODR services. Without such measures, the effectiveness of online mediation and dispute resolution remains compromised, limiting its ability to provide equitable justice in a digitally evolving society (Ghosh, 2020). The 2022 Guidelines of the

25 Gupta, S. (2024). Looking for a lawyer? Startup helps resolve disputes outside courts, solved 35 lakh cases online. The Better India. https://clck.ru/3RrW48

26 Chopra, A. (2024). Revolutionizing justice: NITI Aayog's ODR blueprint for India. NLR Blog. https://goo.su/zzDv4PB

Association of Southeast Asian Nations (ASEAN) on ODR insist upon a government-led system of ODR and ODR administered by the negotiator, conciliator, or mediator holding sufficient knowledge and capability to assist B2C disputes[27].

Conclusion

The ODR mechanism has the potential to provide for a transformative change in access to justice in matters pertaining to consumerism, but it is still at a very nascent stage. There are various challenges pertaining to the digital divide, data privacy, and security concerns, legal recognition, enforceability, and resistance from the traditional legal system as far as the future of ODR is concerned. To address this challenge, there is a need to create a robust framework on ODR and the related law to ensure the effective implementation of ODR as a mechanism and it cannot be done without the efforts and contribution of policymakers, legal practitioners, and technology developers (Schmitz, 2018). Further, effective mediation requires a skilled mediator. There is a need for a comprehensive curriculum for training the mediator. Mediators must remain impartial, which makes a Code of Ethics essential to define the minimum standards they should uphold.

The government ought to enact laws to recognize ODR as a legitimate form of dispute resolution and to provide clear guidelines to implement the ODR mechanism[28]. This includes defining the legal status of ODR agreements, the procedures ODR systems must follow, and how the outcomes can be enforced. The provisions needed for ODR have not yet been fully formulated or integrated into the current framework of consumer protection regulations. Policymakers should collaborate with stakeholders including legal professionals, technology experts as well as consumer rights organizations while drafting comprehensive regulations (Schmitz, 2018). Consumer must be educated about the ODR mechanism through outreach programs including workshops, informational brochures, and online resources. It is crucial to create comprehensive data protection rules to address problems like customer data privacy and security concerns in order to guarantee that ODR is widely accepted. Lastly, addressing the issue of the digital divide is of paramount importance. Governments and Organizations must prioritize tech access programs for underprivileged groups with the necessary tools to engage in ODR platforms successfully. This would entail investing in public internet points, providing subsidized technology for the low-income strata, and programs for digital literacy. ODR platforms should be user-friendly with features such as multilingual support and accessibility for people with disabilities.

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27 Resolutions System Institute (n.d.). Online Dispute Resolution. https://clck.ru/3RrVi2

28 OECD. (2024). OECD online dispute resolution framework. https://clck.ru/3Rr7Kv

References

Amin, N. (2024). A New Frontier in Online Dispute Resolution: Combining AI and Mindfulness. *Journal of Law, Technology, & The Internet*, *15*(2), 283–304.

Andrews, N. (2017). Mediation: International Experience and Global Trends. *Journal of International and Comparative Law*, *4*(2), 218. https://doi.org/10.2139/ssrn.3198571

Ast, F., & Deffains, B. (2021). When Online Dispute Resolution Meets Blockchain: The Birth of Decentralized Justice. *Stanford Journal of Blockchain Law & Policy*.

Barnett, J., & Treleaven, P. (2018). Algorithmic Dispute Resolution—The Automation of Professional Dispute Resolution Using AI and Blockchain Technologies. *The Computer Journal*, *61*(3), 399–408. https://doi.org/10.1093/comjnl/bxx103

Beyleveld, D., & Brownsword, R. (1985). The practical difference between natural-law theory and legal positivism. *Oxford Journal of Legal Studies*, *5*(1), 1–32. https://doi.org/10.1093/ojls/5.1.1

Bhuta, N. (2005). The Antinomies of Transformative Occupation. *The European Journal of International Law*, *16*(4), 732. https://doi.org/10.1093/ejil/chi145

Boot, M. (2012). The aim of a theory of justice. *Ethical Theory and Moral Practice*, *15*(1), 7–21. https://doi.org/10.1007/s10677-011-9308-5

Cortés, P. (2017). *The law of consumer redress in an evolving digital market: Upgrading from alternative to online dispute resolution*. Cambridge University Press.

Ghosh, J. (2020). Digital divide vs digital India: Aspects of privacy and data protection in India. *NUJS Journal of Regulatory Studies*, *5*(4), 23–35.

Gómez, Katia Fach. (2019). The Role of Mediation in Commercial Dispute: Reflection on some Technological, Ethical and Educational Challenges. In C. Titi, & G. K. Fach, *Mediation in International Commercial and Investment Disputes* (p. 8). Oxford: Oxford University Press. https://doi.org/10.1093/law/9780198827955.003.0001

Gupta, A., & Bajpai, A. (2023). Online Dispute Resolution in India: A distant reality or dream? In P. Das (Ed.), *Contemporary Perspectives in International Arbitration: Decoding Global Trends* (pp. 123–145). Thomson Reuters. https://doi.org/10.2139/ssrn.4855121

Ijaodola, A. (2020). *The concept of forced arbitration: An arbitration with wrong footing*. SSRN. https://doi.org/10.2139/ssrn.3739277

Katsh, E., & Rabinovich-Einy, O. (2017). *Digital justice: Technology and the internet of disputes*. Oxford University Press.

Katsh, E., & Rifkin, J. (2001). *Online Dispute Resolution: Resolving Conflicts in Cyberspace*. Jossey-Bass.

Kavita. (2023). Online mediation and dispute resolution in India: Assessing the advantages and disadvantages of e-mediation. *ILI Law Review, Winter Issue 2023*, *105*.

Linden, T. (2019). Trust Me: Combining Online Dispute Resolution, Law and Blockchain Technology. *Indian Journal of Law and Technology*, *15*(2), 454–469.

Martin, E. (2021). The Rise of Online Mediation. *GPSolo*, *38*(1), 39–42.

Mosten, F. S. (2009). Lawyer as peacemaker: Building a successful law practice without ever going to court. *Family Law Quarterly*, *43*(3), 489–518.

Nagel, T. (1973). Rawls on justice. *The Philosophical Review*, *82*(2), 220–234. https://doi.org/10.2307/2183770

Pearson, J. (1982). An evaluation of alternatives to court adjudication. *The Justice System Journal*, *7*(3), 420–444.

Rule, C. (2020). *Online dispute resolution for business: B2b, e-commerce, consumer, employment, insurance, and other commercial conflicts*. Jossey-Bass.

Schmitz, A. J. (2018). A blueprint for online dispute resolution system design. *Journal of Internet Law*, *21*(7), 3–21.

Sen, A. (2009). *The idea of justice*. Belknap Press. https://doi.org/10.4159/9780674054578

Sikri, A. K. (2017). Mediation: Means of achieving real justice in consumer disputes. *International Journal on Consumer Law and Practice*, *5*(1), 1–10.

Singh, S., & Saxena, J. (2024). Consumer Protection Act 2019: A critical analysis. *International Journal of Research Publication and Reviews*, *5*(5), 8984–8987.

Sourdin, T. (2002). *Alternative dispute resolution*. Thomson Reuters (Professional) Australia Limited.

Tan, J., Westermann, H., Pottanigari, N., Savelka, J., Meeus, S., Godet, M., & Benyekhlef, K. (2024). Robots in the middle: evaluating LLMs in dispute resolution. *arXiv*. https://arxiv.org/pdf/2410.07053

Authors information

Solomon Girma Taddesse – PhD, Assistant Professor of Law, Former Dean of the School of Law, Madda Walabu University
Address: Robe City, Bale Zone, Oromia, Ethiopia
E-mail: taddessegirma.phd@nliu.ac.in; solbale@gmail.com
ORCID ID: https://orcid.org/0000-0002-6048-564X
Scopus Author ID: https://www.scopus.com/authid/detail.uri?authorId=57200656542
Google Scholar ID: https://scholar.google.com/citations?user=dJFt15UAAAAJ

Vidhyanshi Bhanwar – Assistant Professor of Law, National Law Institute University
Address: Kerwa Dam Road, Bhopal-462044, India
E-mail: vidhyanshibhanwar@nliu.ac.in
ORCID ID: https://orcid.org/0009-0001-4007-0615
Google Scholar ID: https://scholar.google.com/citations?user=QC1eh9MAAAAJ

Shruti Verma – Ph.D. Scholar, National Law Institute University
Address: Kerwa Dam Road, Bhopal-462044, India
E-mail: shrutiverma9327@gmail.com
ORCID ID: https://orcid.org/0009-0004-1183-95977

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Онлайн-разрешение споров в сфере защиты прав потребителей в Индии

Соломон Гирма Тадессе ✉
Университет Мадда Валабу, Робэ, Эфиопия

Видьянши Бханвар
Национальный юридический институт, Бхопал, Индия

Шрути Верма
Национальный юридический институт, Бхопал, Индия

Ключевые слова

альтернативное разрешение споров,
блокчейн,
защита прав потребителей,
искусственный интеллект,
машинное обучение,
медиация,
онлайн-разрешение споров,
право,
цифровые технологии,
электронная коммерция

Аннотация

Цель: исследовать преимущества, проблемы и последствия интеграции технологий, в частности онлайн-разрешения споров, в систему разрешения споров в Индии, уделяя особое внимание спорам в сфере защиты прав потребителей.

Методы: в исследовании использованы общенаучные методы анализа и синтеза, а также системный, функциональный и сравнительно-правовой подходы для системного изучения концепции онлайн-разрешения споров, его исторической эволюции и практического применения с акцентом на медиационные процедуры. Работа основана на доктринальном, качественном подходе с анализом действующего законодательства, стандартов защиты прав потребителей и практики функционирования судебных систем.

Результаты: полученные результаты свидетельствуют о том, что онлайн-технологии значительно повышают эффективность и доступность разрешения споров; однако в Индии их развитие сталкивается с серьезными препятствиями, включая техническую неграмотность населения, цифровой разрыв, опасения по поводу безопасности и конфиденциальности персональных данных, а также отсутствие четких нормативных правовых документов. Эти ограничения препятствуют равному доступу к правосудию и подчеркивают необходимость разработки всеобъемлющей государственной политики и совершенствования цифровой инфраструктуры. Выявляется взаимодополняющая роль искусственного интеллекта, электронной медиации и технологии блокчейн в обеспечении справедливого и эффективного разрешения потребительских споров.

✉ Контактное лицо

Научная новизна: заключается в комплексном рассмотрении роли онлайн-разрешения споров в контексте индийской системы защиты прав потребителей с учетом современных технологических трансформаций. Выявляются возникающие при этом технологические, юридические и этические проблемы и предлагается видение того, как цифровая трансформация влияет на отправление правосудия в сфере защиты прав потребителей.

Практическая значимость: исследование подчеркивает критическую важность укрепления цифровой инфраструктуры, повышения уровня цифровой и правовой грамотности населения и создания законодательства для поддержки эффективного внедрения онлайн-разрешения споров в индийскую систему правосудия. Работа содержит предложения и рекомендации для органов публичной власти, представителей судебных органов, разработчиков технологий и всех заинтересованных лиц, которые занимаются интеграцией цифровых инструментов в процесс разрешения потребительских споров, обеспечивая при этом справедливость, инклюзивность и равноправный доступ для всех участников правовых отношений.

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Список литературы

Amin, N. (2024). A New Frontier in Online Dispute Resolution: Combining AI and Mindfulness. *Journal of Law, Technology, & The Internet*, *15*(2), 283–304.

Andrews, N. (2017). Mediation: International Experience and Global Trends. *Journal of International and Comparative Law*, *4*(2), 218. https://doi.org/10.2139/ssrn.3198571

Ast, F., & Deffains, B. (2021). When Online Dispute Resolution Meets Blockchain: The Birth of Decentralized Justice. *Stanford Journal of Blockchain Law & Policy*.

Barnett, J., & Treleaven, P. (2018). Algorithmic Dispute Resolution—The Automation of Professional Dispute Resolution Using AI and Blockchain Technologies. *The Computer Journal*, *61*(3), 399–408. https://doi.org/10.1093/comjnl/bxx103

Beyleveld, D., & Brownsword, R. (1985). The practical difference between natural-law theory and legal positivism. *Oxford Journal of Legal Studies*, *5*(1), 1–32. https://doi.org/10.1093/ojls/5.1.1

Bhuta, N. (2005). The Antinomies of Transformative Occupation. *The European Journal of International Law*, *16*(4), 732. https://doi.org/10.1093/ejil/chi145

Boot, M. (2012). The aim of a theory of justice. *Ethical Theory and Moral Practice*, *15*(1), 7–21. https://doi.org/10.1007/s10677-011-9308-5

Cortés, P. (2017). *The law of consumer redress in an evolving digital market: Upgrading from alternative to online dispute resolution*. Cambridge University Press.

Ghosh, J. (2020). Digital divide vs digital India: Aspects of privacy and data protection in India. *NUJS Journal of Regulatory Studies*, *5*(4), 23–35.

Gómez, Katia Fach. (2019). The Role of Mediation in Commercial Dispute: Reflection on some Technological, Ethical and Educational Challenges. In C. Titi, & G. K. Fach, *Mediation in International Commercial and Investment Disputes* (p. 8). Oxford: Oxford University Press. https://doi.org/10.1093/law/9780198827955.003.0001

Gupta, A., & Bajpai, A. (2023). Online Dispute Resolution in India: A distant reality or dream? In P. Das (Ed.), *Contemporary Perspectives in International Arbitration: Decoding Global Trends* (pp. 123–145). Thomson Reuters. https://doi.org/10.2139/ssrn.4855121

Ijaodola, A. (2020). *The concept of forced arbitration: An arbitration with wrong footing*. SSRN. https://doi.org/10.2139/ssrn.3739277

Katsh, E., & Rabinovich-Einy, O. (2017). *Digital justice: Technology and the internet of disputes*. Oxford University Press.

Katsh, E., & Rifkin, J. (2001). *Online Dispute Resolution: Resolving Conflicts in Cyberspace*. Jossey-Bass.

Kavita. (2023). Online mediation and dispute resolution in India: Assessing the advantages and disadvantages of e-mediation. *ILI Law Review, Winter Issue 2023*, *105*.

Linden, T. (2019). Trust Me: Combining Online Dispute Resolution, Law and Blockchain Technology. *Indian Journal of Law and Technology*, *15*(2), 454–469.

Martin, E. (2021). The Rise of Online Mediation. *GPSolo*, *38*(1), 39–42.

Mosten, F. S. (2009). Lawyer as peacemaker: Building a successful law practice without ever going to court. *Family Law Quarterly*, *43*(3), 489–518.

Nagel, T. (1973). Rawls on justice. *The Philosophical Review*, *82*(2), 220–234. https://doi.org/10.2307/2183770

Pearson, J. (1982). An evaluation of alternatives to court adjudication. *The Justice System Journal*, *7*(3), 420–444.

Rule, C. (2020). *Online dispute resolution for business: B2b, e-commerce, consumer, employment, insurance, and other commercial conflicts*. Jossey-Bass.

Schmitz, A. J. (2018). A blueprint for online dispute resolution system design. *Journal of Internet Law*, *21*(7), 3–21.

Sen, A. (2009). *The idea of justice*. Belknap Press. https://doi.org/10.4159/9780674054578

Sikri, A. K. (2017). Mediation: Means of achieving real justice in consumer disputes. *International Journal on Consumer Law and Practice*, *5*(1), 1–10.

Singh, S., & Saxena, J. (2024). Consumer Protection Act 2019: A critical analysis. *International Journal of Research Publication and Reviews*, *5*(5), 8984–8987.

Sourdin, T. (2002). *Alternative dispute resolution*. Thomson Reuters (Professional) Australia Limited.

Tan, J., Westermann, H., Pottanigari, N., Savelka, J., Meeus, S., Godet, M., & Benyekhlef, K. (2024). Robots in the middle: evaluating LLMs in dispute resolution. *arXiv*. https://arxiv.org/pdf/2410.07053

Сведения об авторах

Соломон Гирма Таддессе – PhD, ассистент преподавателя права, экс-декан Школы права, Университет Мадда Валабу
Адрес: Эфиопия, г. Робэ, район Бейл, Оромия
E-mail: taddessegirma.phd@nliu.ac.in; solbale@gmail.com
ORCID ID: https://orcid.org/0000-0002-6048-564X
Scopus Author ID: https://www.scopus.com/authid/detail.uri?authorId=57200656542
Google Scholar ID: https://scholar.google.com/citations?user=dJFt15UAAAAJ

Видьянши Бханвар – ассистент преподавателя права, Национальный юридический институт
Адрес: Индия, 462044, г. Бхопал, Керва Дэм Роуд
E-mail: vidhyanshibhanwar@nliu.ac.in
ORCID ID: https://orcid.org/0009-0001-4007-0615
Google Scholar ID: https://scholar.google.com/citations?user=QC1eh9MAAAAJ

Шрути Верма – PhD, Национальный юридический институт
Адрес: Индия, 462044, г. Бхопал, Керва Дэм Роуд
E-mail: shrutiverma9327@gmail.com
ORCID ID: https://orcid.org/0009-0004-1183-9597

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Artificial Intelligence and International Space Law: Dual-Use Challenges

Anthi Koskina

University of Crete, Rethymno, Greece
National Observatory of Athens, Athens, Greece

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dual-use,
law,
militarization of space,
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space security,
space weapons

Abstract

Objective: to propose an effective legal mechanism for regulating the use of artificial intelligence in the space sector with a focus on preventing harmful effects and preserving the peaceful and purposeful use of technology.

Methods: the research uses the method of comparative legal analysis, doctrinal legal reasoning and scenario analysis of escalation risks. It provides a normative historical analysis of the main treaties of international space law and state practices, comparing them with the approaches of international environmental law focused on achieving specific results. The author additionally relies on the analysis of precedent documents and public policy initiatives illustrating the actual practices of militarization and commercialization of space infrastructure.

Results: the study demonstrates that existing international treaty mechanisms do not provide sufficient regulation for dual-use artificial intelligence systems. It identifies gaps in definitions, codification of responsibility, and control mechanisms for autonomous actions. An alternative regulatory approach is proposed, focused not on regulating the technology per se, but on prohibiting specific harmful results (formation of orbital debris, uncontrolled autonomous attacks, signal suppression, etc.). Based on this logic, the author developed a concept of an international agreement with a mandatory annex listing prohibited uses of artificial intelligence and mechanisms for holding states accountable.

Scientific novelty: a result-oriented approach to regulating artificial intelligence in space was formalized and justified from a legal point of view, adapting the prohibition model to modern dual-use threats. A typology of prohibited consequences was proposed and correlated with the existing international responsibility institutions.

Practical significance: the proposal may serve as the basis for the development of an international treaty or an add-on to international space law. It provides a tool for national licensing and control, facilitates the coordination of positions between states and private operators, and is aimed at preserving innovation while minimizing risks to the sustainability of space activities.

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Contents

Introduction

Space has become increasingly necessary for States' economic and strategic interests, serving both commercial and protective functions. As Punnala et al. underline (Punnala et al., 2024), it now forms an "indispensable backbone of our global infrastructure" as it is enabling critical applications from national security to civilian needs. Indeed, to only mention a few examples, remote sensing has transformed numerous fields – such as agriculture, disaster management, and communications – demonstrating space's ever-growing importance in modern society (Salin, 1992).

The above development has had two critical consequences of relevance to the present study. First, it generated increased interest in space activities, attracting more participants who were motivated by the sector's emerging economic potential. As a result, the growing number of entities engaged in space activities invested more and more in innovations that will enhance safety, efficiency, and cost-effectiveness; although considerable potential remains for additional innovation and optimization in these areas (Aglietti, 2020; Enholm, 2024). Vice versa, the conditions for the conduct

of space activities were further improved, especially thanks to artificial intelligence (AI) which plays a pivotal role in optimizing space operations, attracting further investments in space and expanding accessibility. In this sense, as a corollary to the above, space infrastructure became strategically necessary, but also increasingly important and expensive, necessitating robust protection; since a wide range of risks also emerged, from orbital debris and accidental collisions to potential threats posed by adversarial actors' practices in the context of intensifying geopolitical competition in the new space race.

Hence, its second (and even more) significant consequence is the accelerating militarization of space[1], driven by terrestrial and celestial geopolitical tensions – including competition over asteroid resources and potential mining rights – as well as by states' strategic necessity to assert dominance and protect their substantial space infrastructure investments; which is distinct from "space weaponization"[2], defined here as placing orbital or suborbital satellites to attack enemy satellites, using ground-based direct ascent missiles to shoot spacejets etc.[3] Still, despite the ongoing debate over the exact differentiation between space militarization and weaponization[4], this trend has emerged as a tremendous issue in international discussions; especially given that new technologies, including AI, allow for novel military uses[5]: e.g., reconnaissance satellite systems, space infrastructure which is used to support terrestrial conflicts, dual-use space objects etc. (noting that many of those appear to pose problems even as to their registration under existing space governance frameworks (Berrang, 2025)). Therefore, in essence, this development raises critical questions about the future of space security, the need to ensure the protection of space infrastructure and, finally, the adequacy of existing regulatory regimes.

Indeed, despite their current applicability, the foundational space treaties – most notably the Outer Space Treaty (OST), which is also regarded as the cornerstone of international space law (ISL) – were formulated in the 1960s and 1970s. As

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1 "Space-based system, which provides significant support to the military, is generally called Militarization of space. Such support includes intelligence, surveillance, mapping, charting, communications, navigation, missile warning, and environmental data. It is the placement of military technology in outer space <…>. Space militarization is wider term than space weaponization. The militarization of space does not necessarily entail its weaponization", see (Sheer & Shouping, 2019).

2 "Currently, space is not weaponized. There are no weapons deployed in space or terrestrially (in air, sea, or on the ground) meant to attack space objects, such as satellites; nor are satellite weapons deployed against terrestrial targets", see (Saperstein, 2002).

3 Rajan, V. (2024, April 19). Space weaponization: All you need to know about. ClearIAS. https://clck.ru/3RhJXK

4 See inter alia, Whitehead, R. (2025, February 27). How the modern space race is shaping and shaped by AI. IOAGlobal. https://clck.ru/3RhJiP

5 Ibid.

such, they are now widely regarded as being insufficient to meet the complexities of contemporary space activities. A fundamental aspect of this inadequacy stems from the fact that critical concepts, such as the definition of a "space object" were never fully elaborated. This lack of precision meant that ISL could not (and was possibly not ready to) evolve alongside rapid technological progress, which resulted in obsolete definitions. As a response, the existing ISL framework was complemented – at various points – though bottom-up initiatives. For instance, to regulate the space debris issue, which was not addressed by the above-mentioned treaties, instruments adopted through this particular procedure are now the point of reference (see e.g. the Inter-Agency Space Debris Coordination Committee (IADC) guidelines[6]). Still, the urgency of these legal gaps becomes now more critical, when considering the two above developments: i. e., the increasing importance of space, based on the growing use of new technologies such as Artificial Intelligence (AI) for space operations (for which existing legal frameworks provide no clear guidance); and the escalating militarization of space, which introduces novel risks to both terrestrial and orbital infrastructure in ways that the original treaty drafters could not have anticipated.

Therefore, given the current state of space activities –and taking, notably, into account their growing strategic importance and militarization– a critical question emerges: how should critical space technologies be regulated, considering that both economic and defense-related space activities largely depend on them? While this challenge is longstanding, its urgency and importance has intensified with the advent of AI[7], as a dual-use technology capable of optimizing operations to unprecedented levels. Such advancements could result in exponentially amplified outcomes, whether positive or negative. However, the foundational ISL treaties adopted in the 1960s–70s failed to establish an effective governance framework for these systems; and today, the need to regulate said high-impact dual-use systems has become even more critical, due to the rising geopolitical tensions coupled with humanity's increasing reliance on space infrastructure.

Against this background, and following on from the Introduction (Section 1), Section 2 of this paper will thoroughly analyze AI's dual-use capabilities as well as their transformative potential for both offensive and defensive operations. Section 3 will conduct a critical analysis of the regulatory gaps in existing International Space

6 Inter-Agency Space Debris Coordination Committee. (2025). IADC space debris mitigation guidelines (U.N. Doc. A/AC.105/C.1/2025/CRP.9). United Nations Committee on the Peaceful Uses of Outer Space, Scientific and Technical Subcommittee. https://clck.ru/3RhJte

7 International Institute of Space Law. (2024). Balancing innovation and responsibility: International recommendations for AI regulation in space (Report of the Working Group on Legal Aspects of AI in Space). International Institute of Space Law. https://clck.ru/3RhJyK

Law (ISL), with a particular focus on the limitations of the Outer Space Treaty (OST) framework in addressing emerging technological realities. Then, Section 4 will assess the risks of deploying AI in space, during potential space conflict situations, and analyze risk escalation pathways. Following on from that, Section 5 will propose a new regulatory approach, aimed at mitigating the risks of AI being employed in ways that could compromise space security and sustainability. Section 6 presents the study's concluding remarks.

1. Asset protection or warfare tool? The extreme dual-use potential of AI in space

From the outset, Space was used for military purposes, such as for reconnaissance operations (Muszyński-Sulima, 2023). During the Cold War, for example, the U.S. and the USSR deployed hundreds of satellites, many of which were secretly designed for intelligence-gathering. Yet, at the same time, space technology expanded beyond purely military applications, and it became indispensable for civilian uses as well. Indeed, as Bescheron and Gasnier mention (Bescheron & Gasnier, 2024), the Cold War rivalry accelerated developments in the field of missile and satellite technologies, leading as well to other important dual-use innovations; like the Global Positioning System (GPS), a military asset soon used for civilian purposes. Space maintained, during all the following years, its strategic military utility; and States recognized, e.g. through repeated debates on the Prevention of an Arms Race in Outer Space (PAROS) resolution at the UN General Assembly, the importance of existing military uses but also the collective desire to prevent space's further weaponization[8].

In recent decades, the militarization of space has escalated dramatically. In fact, the ongoing "new space race" taking place among the major spacefaring states – i. e., a race spanning all economic, environmental, communications and scientific domains – appears to result on more and more military implications (Bescheron & Gasnier, 2024). By way of illustration, space infrastructure is being increasingly used within the context of conflicts on Earth, such as was the case with the 1990 Gulf War (a situation in which space assets were deployed at unprecedented scale) and, even more, during the war in Ukraine (Berrang, 2025). Most alarmingly, though, this militarization is still accelerating. Indeed, a critical development is the Trump administration's recent announcement of the 'Golden Dome' initiative[9]; that is a $175 billion missile defense system incorporating ground- but

[8] Acheson, R., & Fihn, B. (n.d.). Outer space: Militarization, weaponization, and the prevention of an arms race. Reaching Critical Will, Women's International League for Peace and Freedom. https://clck.ru/3RheH5

[9] U.S. Department of Defense. (2025, May 20). Secretary of Defense Pete Hegseth statement on Golden Dome for America [Press release]. https://clck.ru/3RhKTE

also space-based interceptors[10]. Such developments underscore the importance of space (and of space infrastructure, as well) for military operations, and raise questions about arms control, but also, and even more critically, about the protection of space infrastructure and the sustainable use of space and its resources.

In fact, among the most striking developments in this domain is the rapidly accelerating deployment of space-based defensive systems. Hence, as the Secure World Foundation underlines[11]: "The existence of counterspace capabilities is not new, but the circumstances surrounding them are[12]" as there are now greater incentives than ever to develop (and potentially to use) offensive counterspace weapons, with consequences that could ripple across the global economy due to our growing dependence on the space infrastructure[13]. What makes this situation particularly significant though, is Artificial Intelligence (AI)'s transformative role. AI dramatically enhances both the effectiveness and efficiency of space defense investments. By way of illustration, some scholars mention that Chinese researchers have already conducted AI-powered simulations of attacks on satellites to evaluate disruption capabilities; which suggests that similar projects are undoubtedly underway elsewhere (or that they will soon be), underscoring how AI is revolutionizing space warfare. In truth, mention is already made to this new reality, which is characterized as potentially paving the way for a Hyperwar ("AI, and the form of warfare it enables –Hyperwar – is fundamentally reshaping military strategy and operations. Its influence spans multiple domains, from enhancing situational awareness and sensor augmentation to predictive maintenance and autonomous decision-making"[14]); which is at the same time allowing the creation of an escalating cycle: as space systems become more complex and expensive, the need to protect them grows as well, proportionally. Indeed, given the global economy's critical dependence on space infrastructure, nations, but also private entities, face mounting pressure to allocate greater resources to space assets security and space sustainability.

Amid these developments, AI has mainly emerged as both the most promising solution and most formidable challenge in space security – a paradox that reflects the dual-use nature of most of space technology itself. On one hand, AI systems are proving

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10 Brennan, D., & Yiu, K. (2025, May 21). Trump's 'Golden Dome' risks weaponization of space, China says. ABC News. https://clck.ru/3RhKXx

11 Secure World Foundation. (2025, April). Global counterspace capabilities: An open source assessment [Report]. Secure World Foundation. https://creativecommons.org/licenses/by-nc/4.0

12 Emphasis added.

13 Ibid.

14 Husain, A. (2024, August 19). The military applications of artificial intelligence in space. Forbes. https://clck.ru/3RhLGq

remarkably effective for Space Situational Awareness (SSA), such as for the mapping of orbital debris (Vansia, 2024); or for predicting and avoiding potential collisions[15]. On the other hand, the same AI capabilities may as well be utilized for offensive purposes, including the identification and targeting of adversary satellites[16]. Hence, this duality points to a fundamental security dilemma in the space domain (Shmigol, 2022), as the inherent ambiguity of dual-use systems creates a critical vagueness in space operations: civilian communications satellites can be repurposed for military reconnaissance; scientific probes may carry weapons-capable elements; and ostensibly commercial space stations could well host strategic assets. In fact, recent conflicts have demonstrated how nominally civilian space infrastructure can be rapidly weaponized (Berrang, 2025), while it may also happen that some systems or space objects used for military purposes may –deliberately– not have been registered or declared as such from the beginning (Muszyński-Sulima, 2023).

In other words, the distinction between civilian and weaponized technology being used in outer space is inherently ambiguous[17]. However, Artificial intelligence compounds this uncertainty; indeed, its effects depend entirely on implementation, as it may well be utilized to enable both defensive operations and offensive capabilities (Shmigol, 2022; Bernat, 2019). Importantly, this challenge currently intensifies with the growing proliferation of small satellites (which democratize access to space) as they can easily be used as weapons (Shmigol, 2022; Bernat, 2019). Precisely, both emerging states and non-state actors can deploy low-cost microsatellites capable of kinetic collisions, electronic jamming, or any other disruptive actions; not to mention that some launching States or entities try to also avoid their registration (Berrang, 2025), which evidently creates some additional layers of strategic risk by operating outside the established frameworks. In this sense, the proliferation of small satellites lowered the cost and technical barriers to space-based weapons, enabling even smaller nations to deploy orbital threats, and AI exacerbated this challenge due to its inherent dual-use nature.

Hence, the pressing need to efficiently regulate AI in space emerged because of its dual capacity for both huge harm and protection. On the one hand, it could enable or

15 Pultarova, T. (2021, April 29). Artificial intelligence is learning how to dodge space junk in orbit. Space.com. https://clck.ru/3RhLP9

16 See Husain, supra note 14. See also Easley, M. (2024, June 5). DARPA harnesses AI to keep tabs on space weapons, spy satellites on orbit. DefenseScoop. https://clck.ru/3RhLRR

17 "The inherent nature of any technology is dual use", see International Institute of Space Law. (2024). Balancing innovation and responsibility: International recommendations for AI regulation in space (Report of the Working Group on Legal Aspects of AI in Space). International Institute of Space Law. https://clck.ru/3RhLTV

even escalate conflict in orbit (e. g., by facilitating space warfare); on the other hand, it is equally important for protecting critical space infrastructure and/or for enhancing deterrence, while enabling rapid, data-driven decision-making. In essence, AI is driving space capabilities in two divergent directions; namely, it redefines both warfare and security practices. Still, AI remains unregulated in International Space Law (ISL), which thus demands urgent scrutiny, particularly given the foundational principles of ISL: the OST established space as a domain for "peaceful purposes", although this fundamental concept was never clearly defined. Thus, as AI challenges the traditional classifications of both space objects and threats caused by weapons in space (it is not, inherently, a weapon but it may produce equally catastrophic effects), an examination of its regulatory challenges is not only timely but also imperative.

2. Innovation outrunning regulation: AI's role in widening ISL's governance gaps

As presented above, AI is fundamentally reshaping space activities, operating though along two parallel and – to a certain extent – contradictory ways. Indeed, (i) AI enables advanced space weapons, such as autonomous anti-satellite systems and AI-guided weapons, raising the risks of escalation and conflict. Nevertheless (ii), it may likewise improve surveillance and tracking, in addition to decision-making capabilities, offering potential safeguards against space threats. Hence, this critical duality creates important gaps in the existing framework of ISL. As a result, governance challenges emerge, leaving key questions that must be addressed.

First of all, it is necessary to clarify that International Space Law (ISL) takes a specific, and to a certain extent restrictive, approach to defining what constitutes launchable and operable man-made technology in space. In particular, the foundational treaties –namely, the Outer Space Treaty (OST) adopted in 1967, the Rescue Agreement (1968), the Liability Convention (1972), the Registration Convention (1975) and the Moon Agreement (1979) – created a comprehensive legal framework governing human activity in space. In this context, though, the specific concept of "technology" was never mentioned; on the contrary, reference was only made to the objects launched and operating in space. At the same time, the above treaties never provided an explicit definition of "space objects": instead of establishing categorical parameters, they only adopted a descriptive approach (see, for instance, the first articles of both the Liability Convention and the Registration Convention), and described those through numerous characteristics, evolving however in function across the different agreements.

Therefore, the space objects are all regarded as being man-made, tangible assets, given that ISL repeatedly mentions physical, human-made constructs launched or operating in

outer space: the OST refers, in Art. VII and VIII, to "objects" launched in space, implying artificial, constructed entities; the Liability Convention and the Registration Convention (Art. I) include "component parts" and "launch vehicles", reinforcing their material nature and the Moon Agreement (in Art. 8, 11, 12) makes reference to "space vehicles, equipment, facilities, stations, and installations", confirming that space objects are tangible assets. However, ISL treaties did not restrict what qualifies as a space object based on size, mass, or complexity. For instance, the Registration Convention (Art. I and IV) requires reporting on "space objects" in general, regardless of dimensions, and the OST (Art. VII) holds states liable for damage caused by "such object or its component parts" irrespective of any characteristics, such as size etc. At the same time, it is explicitly stipulated that space objects are not necessarily single, indivisible units as they may consist of (several) components; e.g., structures that separate in orbit or upon landing (see the first articles of both the Liability Convention and the Registration Convention; Art. VIII of the OST, and Art. 13 of the Moon Agreement). Following on from that, they can be assembled or expanded, i.e., to form larger structures, such as on the Moon or other celestial bodies; indeed, an explicit reference is made to installations, stations or facilities (see Art. XII of the OST; Arts. 9, 11 and 12 of the Moon Agreement – note that the Moon Agreement makes specific reference to unmanned stations on the Moon in its Art. 9, and to structures connected with its subsurface in its Art. 11, to potentially encompass future structures on the Moon). Consequently, man-made objects sent in space may be both (i) capable of motion – orbital or non-orbital (i. e., beyond Earth-orbit, see Art. II of the Registration Convention) – as Art. IV of the Registration Convention requires reporting of orbital parameters (nodal period, inclination, apogee, perigee), which in reality confirms that space objects are expected to have velocity and trajectory; and (ii) permanently stationed (e.g., Art. 8 of the Moon Agreement mentions "facilities, stations and installations", able to be anywhere on the surface). Finally, space objects could well bear dangerous payloads, in case they contain hazardous or radioactive materials (specific mention is made in Art. 7 of the Moon Agreement) or cause damage. Hence, it was precisely established that space objects remain under the legal authority of the launching state, regardless of their location (Art. VII and VIII of the OST; Art. 12 of the Moon Agreement).

In conclusion, reducing – in ISL – all human-made space constructs to "space objects" (in all tangible forms, though, as stated) overlooked the escalating value of technology and data in contemporary space activities. At the same time, this approach created a clear regulatory void regarding AI governance in space. Be that as it may, attempting to establish an internationally agreed definition of AI – in order to adopt rules for its uses in space–, and agree first on whether it fits into the established approach to "space objects" or whether a new term should be adopted, would now require rethinking all

the ISL's foundational concepts, as all the existing space law treaties are based on this traditional framework governing human-made physical constructs.

In fact, the rigid and limited definition of a "space object" makes clear that International Space Law (ISL) treaties – all drafted in an earlier technological era – are essentially ill-equipped to regulate (modern) space activities; indeed, space activities are based on technologies which are destined to continuously develop upon time, and the latter are now fundamentally different from the systems for which these treaties were originally designed. As a result, ISL now faces important challenges in regulating current technologies with full efficiency (not to mention the unresolved initial question of whether AI should even be classified as a space object[18]). To give an example from a slightly different background, current space systems, such as mega-constellations, present important difficulties in the application of ISL (Byers & Boley, 2023; Abbas, 2025), and these issues are further compounded by the proliferation of small satellites, particularly those under private ownership; which introduces several unresolved legal and operational ambiguities[19] (Hertzfeld, 2021). In this sense, critical aspects of space governance – including registration and liability – remain inadequately addressed. Yet, the most pressing complications for ISL appear to stem from the increasing integration of AI in space activities, which introduces both a novel operational dimension and unprecedented ethical dilemmas to space technology governance.

To only mention a few concerns, scholars emphasize that AI has very critical features. Hence, it will require particular authorization – through national licensing – and ongoing State supervision to ensure compliance with ISL; specifically, States should guarantee the continuous security of AI-equipped spacecraft, to protect automation, navigation, and communication systems from hacking or creating risks (Martin & Freeland, 2021). The issue is inherently complex, but it becomes even more challenging due to two critical factors. First, AI's autonomous decision-making capacity introduces uncertainty, especially in case of lack of clarity around how much autonomy operators will delegate to AI systems –and whether they will provide full information on said autonomy (particularly if we take into account that private operators have already attempted to circumvent ISL rules, as seen in the tardigrades incident (Gundersen, 2021)). Still, even more critical is AI's dual-use nature, as it also raises security and transparency concerns, particularly for military or dual-use satellites in an increasingly militarized space domain;

[18] International Institute of Space Law. (2024). Balancing innovation and responsibility: International recommendations for AI regulation in space (Report of the Working Group on Legal Aspects of AI in Space). P. 239. https://clck.ru/3RhLTV

[19] Palkovitz Menashy, N. (2019). Regulating a revolution: Small satellites and the law of outer space [Master's thesis, Leiden University]. Leiden University Scholarly Publications. https://clck.ru/3Rhe7c

hence, a key question would be how easily an AI system in space could transition from civilian to military operations, shifting from defensive to offensive functions. This issue is in fact further complicated by the difficulty of ensuring AI operates correctly in rare or high-stakes scenarios, such as space conflict, as data collection and algorithmic training face severe limitations (Koskina, 2023).

Following on from the above, it appears that the existing regulatory gaps in the current ISL framework will be exacerbated by AI's unique features; especially given that other legal frameworks – i. e., such as International Humanitarian Law (IHL), and/or the EU General Data Protection Regulation (GDPR) – address only specific aspects of AI, resulting in a fragmented approach[20]. As a result, although Article VI of the OST establishes state responsibility for space activities, ISL fails to clarify (or even provide guidelines for) liability for AI systems, even in simple cases. More complex scenarios (such as an AI-enabled satellite operated by one State but dependent on technology and infrastructure i.e., from multiple others) highlight how traditional liability regimes have become inadequate[21]. Furthermore, AI introduces a new category of space technologies that defy conventional classifications for weapons or dual-use systems, raising questions about whether new regulatory categories are needed[22]. These challenges are compounded by States asserting some kind of sovereign rights over their space assets under Article VIII of the OST, as is exemplified by the U.S. declaring its space systems "sovereign property with the right of passage through and operations in space without any interference"[23]. In other words, the accelerating advancement of AI technology (in conjunction with its growing use in outer space) – coupled with the absence of specific ISL regulations– raises critical questions that go beyond whether current rules remain adequate; such questions compel us to essentially reconsider whether space operations now demand an entirely new regulatory approach, one that will properly account for their inherent dual-use nature and even, in some cases, AI's capacity to also function autonomously without human supervision. To determine, however, how urgently this issue requires attention, we must also examine the risk of escalation in space, i. e., which would force decisions about AI's use – whether as a weapon or a defensive tool.

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20 International Institute of Space Law. (2024). Balancing innovation and responsibility: International recommendations for AI regulation in space (Report of the Working Group on Legal Aspects of AI in Space). P. 239. https://iisl.space/iisl-working-group-on-legal-aspects-of-ai-in-space/

21 Ibid.

22 Ibid.

23 Berkowitz, M. (2024, December 16). Countering threats to US commercial space systems. The Space Review. https://www.thespacereview.com/article/4910/1

3. Risks of escalation in space to examine the need for rules on AI uses

The proposal of a legal framework to regulate armed conflict in space requires, first, an analysis of plausible scenarios as regards the potential occurrence of hostilities in space, as understanding the urgency of such regulatory measures is critical. Analysts increasingly contend that space warfare has now become a realistic threat, given the growing dependance of States on space infrastructure (namely for communications, navigation, as well as national security), combined with the strategic imperative to also defend assets while compromising adversaries' access; all this could lead to conflicts involving both existing weapons systems and emerging AI technologies[24]. At the same time, although tensions could indeed push States toward a conflict, the catastrophic consequences suggest it may never really materialize.

Against this (theoretical) background, a first potential scenario would consist in the most optimistic perspective, where a large-scale space war will never materialize due to the risks involved[25]. Precisely, Penent[26] argues that the critical consequences of a conflict in outer space –such as mainly the generation of orbital debris and the mutual vulnerability created by global dependence on space infrastructure – serve as powerful deterrents against open hostilities. These considerations push States toward strategic restraint. In this case, instead of developing overt space weapons, major space powers will adopt policies of "under-weaponization" and ambiguous tactics such as cyber operations, that will allow them to pursue strategic goals without crossing the threshold into direct conflict. One may note that, in practice, some States have already translated this approach into concrete efforts to prevent space weaponization, e.g.: the joint China-Russia draft Treaty on the Prevention of the Placement of Weapons in Outer Space, introduced at the Conference on Disarmament in 2008, and revised in 2014[27]; political statements by several States mentioning that they will not be the first to deploy weapons in space[28]; or Russia's "No First Placement" (NFP) initiative, which has gained support from thirty nations (Shmigol, 2022). All these initiatives culminated in the December 2023

24 Weichert, B. J. (2024, December 9). There will be a war in space. This is what it will look like. Popular Mechanics. https://clck.ru/3RhLuW

25 Penent, G. (2021, June). The space war will not happen. Vortex: Studies on Air and Space Power, 1, 8. French Air and Space Force, Centre for Strategic Aerospace Studies (CESA). https://clck.ru/3RhLxH

26 Ibid.

27 Conference on Disarmament. (2014, June 12). Letter dated 10 June 2014 from the Permanent Representatives of the Russian Federation and China transmitting the updated draft treaty on prevention of the placement of weapons in outer space (PPWT) (CD/1985). United Nations. https://clck.ru/3RhLyb

28 United Nations General Assembly. (2023). No first placement of weapons in outer space (Resolution A/RES/78/21).https://clck.ru/3RhM2n

adoption of UN General Assembly Resolution A/RES/78/21, which formally added the "No first placement of weapons in outer space" sub-item to the UN official agenda[29]. However, although this first scenario – in which a space war fails to materialize – would eliminate the need for specific regulations on the uses of AI in the context of hostilities in space, the inherent uncertainty of future developments necessitates a parallel examination of alternative scenarios.

On the opposite extreme, a second potential scenario would be that States will actively deploy and/or use weapons to conduct a war in space – including AI systems – as an extension of terrestrial warfare. Such a scenario remains plausible, given the current global tensions (such a space conflict would reflect Earth-bound geopolitical rivalries[30]), but also the strategic and financial value of space infrastructure. In this case, it is likely that few States would categorically avoid hostile acts in orbit, especially with AI's expanding military applications. On a more practical ground, analysts already note a growing dependence on space systems (both state and commercial) for terrestrial warfare, blurring the traditional boundaries between civilian and military domains (Berrang, 2025). The U.S. exemplifies this trend, as it recently declared its space systems "sovereign property" with rights to unimpeded operation[31] while explicitly integrating commercial assets into national security frameworks to enhance resilience (Berrang, 2025). Importantly, said trend was institutionalized through initiatives like the U.S. Space Force (established in 2019), in addition to the North Atlantic Treaty Organization (NATO) recognition of space as a warfighting domain (Peperkamp, 2020), while other key space faring nations followed suit[32, 33], reflecting a broader normalization of space as a theater of operations. As a result, the line between commercial and military infrastructure seems to be now eroding. Hence, if States are growingly using private-sector space capabilities – from satellite communications to Earth observation – for defense purposes (to incorporate the "commercial space sector into the national security architecture"[34]) space-based

[29] United Nations General Assembly. (2023). No first placement of weapons in outer space (Resolution A/RES/78/21).https://clck.ru/3RhM2n

[30] Penent, G. (2021, June). The space war will not happen. Vortex: Studies on Air and Space Power, 1, 8. French Air and Space Force, Centre for Strategic Aerospace Studies (CESA). https://clck.ru/3RhM6m

[31] Berkowitz, M. (2024, December 16). Countering threats to US commercial space systems. The Space Review. https://clck.ru/3RhM7y

[32] Harvey, B. (2022). Military space - how worried should we be? *ROOM: The Space Journal of Asgardia*, *1*(31). https://clck.ru/3RheCh

[33] See also China Military Online. (2024, April 19). Chinese PLA embraces a new system of services and arms: Defense spokesperson [Press release]. https://goo.su/Bia2

[34] Richard, T. (2025, January 6). Year ahead – U.S. Department of Defense and Space Force commercial space strategies. Lieber Institute, West Point. https://clck.ru/3RhMTB

AI will most probably be used to enhance terrestrial warfare (targeting, surveillance) and it could likewise enable direct orbital combat. Consequently, in this scenario, robust regulations governing the uses of AI systems in space for military purposes become imperative to prevent uncontrolled escalation – still, while urgent adoption of such rules would be needed, current realities suggest we have not yet reached this critical threshold.

Between the above extremes of full-scale space weaponization and complete demilitarization presented above, lies a more plausible scenario: States develop space weapons using AI-enabled systems essentially for deterrence; in fact, this approach mirrors nuclear deterrence logic where military capabilities are designed to prevent conflict rather than create it. While the two extreme scenarios mentioned above remain unlikely, this intermediate path is already unfolding. Indeed, evidence shows a sharp rise in military space expenditures. For instance, Erwin[35] states that, "government space budgets grew 10 % from 2023, driven largely by defense-related investments that reached $73 billion. The surge reflects mounting concerns about space as a contested military domain alongside traditional theaters like air, sea, and cyber". In essence, this trend mainly creates a paradox, given that nations compete for military advantage in orbit while continuing civilian space cooperation[36]. Be that as it may, AI seems to have a central role within this specific context. Effectively, it is now mentioned that "Information will be an essential weapon in future warfare and defense operations. <…> AI algorithms are being created to monitor, anticipate, and react in case of on-orbit and in-ground space conflicts"[37]. However, in this specific scenario, although the risk of space warfare is real – especially amid existing, rising terrestrial geopolitical tensions – its manifestation will likely differ from traditional hostilities. In reality, one could argue that States will try to avoid kinetic attacks (missile strikes on satellites), as these would generate catastrophic debris, endangering all kinds of space activities. Instead, states would likely focus on non-kinetic tactics, such as jamming, spoofing, or cyberattacks; tools already in use today (Bescheron & Gasnier, 2024). Still, even in that case, a critical issue would remain, given the unknown consequences that AI systems could have. Precisely, Swope[38] underlines that Edgar J. Kingston-McCloughry' s warning about

35 Erwin, S. (2025, January 15). Defense spending propels government space budgets to new heights. SpaceNews. https://clck.ru/3RhMoK

36 Ibid.

37 ProcureAM. (n.d.). 5 ways AI is used in space. Nasdaq. https://clck.ru/3RhMrs

38 Ibid.

airpower's early days ("There has perhaps never in the history of warfare existed a comparable state of ignorance about the potentialities of available weapons") may equally apply to space, today. Hence, the most probable outcome would be a continuation of military investments without direct conflict, where States will all develop AI for space dominance (such as surveillance, infrastructure protection etc.) while avoiding overt destruction. At the same time, this tolerance for "gray-zone" tactics – e.g., electronic warfare or dual-use AI – will also set a precedent: these actions could normalize hostility in space, paving however the way for a new era of non-kinetic but destabilizing warfare.

Consequently, this last developing scenario, whose foundations are already observable, reveals the urgent need for AI-space regulations. In essence, though, such a framework should take into account the fundamental challenge posed by AI inherent dual-use nature, considering that recent conflicts have demonstrated a growing erosion between civilian and military uses of space systems[39]. In other words, it is necessary to examine whether a completely new approach to governing AI space systems would be more efficient; one that would establish a functional framework in a rather short order, hence without having to revisit foundational ISL principles.

4. A new approach to regulating AI in space: efficiency, but also sustainability

Following on from the above, it is now clear that the regulation of AI systems in space must consider three key realities. First, AI's dual-use nature, as this means that civilian systems can easily transition to military uses, blurring regulatory distinctions. Second, the fact that states frequently obscure their military space activities, when converting civilian infrastructure, undermining transparency efforts. Third, the fact that nations that are capable of space warfare are usually the ones that possess the required technological strength, and therefore create a near-peer dynamic distinct from terrestrial asymmetric conflicts[40]; and from a certain perspective, this situation mirrors Cold War tensions between nuclear-armed superpowers, that resulted in the 1967 Outer Space Treaty to prevent escalation. Hence, today, with AI as the novel technological challenge, one may argue that similarly strong regulatory frameworks are needed to manage competition between space rivals of comparable strength. Still, the issue lies in finding rules that efficiently account for AI's dual-use applications while addressing states' reluctance

[39] International Institute of Space Law. (2024). Balancing innovation and responsibility: International recommendations for AI regulation in space (Report of the Working Group on Legal Aspects of AI in Space). International Institute of Space Law. https://clck.ru/3RhN7U

[40] Stojanovic, B. (2025, January 20). Astropolitics and the militarisation of space: The new arms race? DiploFoundation. https://clck.ru/3RhN8z

to provide information about military space capabilities, within a context where major players possess the same means to weaponize their infrastructure.

Still, despite the significance of this challenge, the international community has thus far failed to establish an effective and well adapted legal framework; such efforts are hindered by States' inability to reach consensus on fundamental definitions and agree upon key conceptual parameters necessary for formulating actionable rules. For instance, Sönnichsen & Lambach (2020) mention the major issue of deciding on whether the concept of "space weapons" ought to be limited to systems designed only for orbital warfare or may additionally encompass dual-use technologies, with terrestrial military applications. These initial challenges are exacerbated by the inherent complexities of regulating AI in the context of space, per se[41]. Hence, based on the above, an alternative regulatory approach would be to shift focus towards prohibiting specific harmful outcomes of AI in outer space rather than regulating the uses or the programming of AI systems; in this case, a results-based framework would allow to circumvent persistent definitional disputes as well as ethical programming impasses, while still mitigating risks of conflict escalation.

In reality, this approach has already been adopted, to a certain extent, in Art. IV of the OST, which provides – in this regard – a compelling precedent. Indeed, said provision mentions that "States Parties to the Treaty undertake *not to place in orbit* around the Earth any objects carrying nuclear weapons or any other kinds of weapons of mass destruction, *install such weapons* on celestial bodies, or *station such weapons* in outer space in any other manner[42]". In other words, Art. IV operates on the key principle that certain outcomes ought to be prohibited categorically, without requiring the existence of any unethical intention, or the non-compliance with conduct rules. Importantly, while Art. IV explicitly bans Weapons of Mass Destruction (WMD), it fails to define them – a gap that renders its application to AI systems in space particularly problematic, given the AI technology's post-treaty emergence. However, this clear prohibition nevertheless provides a really valuable regulatory model that could well be adapted, mutatis mutandis, to govern AI uses in space today. In other words, rules of governance for the uses of AI in space could focus on identifying and prohibiting clearly dangerous acts, such as AI used in a military purpose where the risks are most acute. This outcome-based approach would offer important advantages, as it would provide clear compliance standards,

41 International Institute of Space Law. (2024). Balancing innovation and responsibility: International recommendations for AI regulation in space (Report of the Working Group on Legal Aspects of AI in Space). International Institute of Space Law. https://clck.ru/3RhNQg

42 Emphasis added.

and also allow to avoid protracted theoretical debates like those on the issue of ensuring an ethical use of AI in space.

For the sake of precision, it is important to mention that this approach has been widely used in the context of International Environmental Law, as the definition of concrete objectives – i. e., rather than general rules of behavior –, allows for targeted prohibitions of specific harmful activities. For instance, the Montreal Protocol on Substances that Deplete the Ozone Layer[43] states, in its Preamble, the unambiguous goal "to protect the ozone layer by taking precautionary measures to control equitably total global emissions of substances that deplete it, with the ultimate objective of their elimination". This clear environmental objective then translates into practical action through Annex A, which enumerates, precisely, which chemical substances fall under regulatory control. Similarly, the Kyoto Protocol to the UN Framework Convention on Climate Change[44] likewise adopts the very explicit aim of achieving "stabilization of greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system" (its Preamble directly mentions Art. 2 of the UNFCCC). Having established this clear objective, Article 3 then clearly mandates that "Parties included in Annex I shall ... ensure that their aggregate anthropogenic carbon dioxide equivalent emissions of the greenhouse gases listed in Annex A do not exceed their assigned amounts". Therefore, all these examples reveal a consistent regulatory pattern: first establishing a concrete (environmental protection) goal, then laying down very specific controls on precisely defined acts. From a policy perspective, such an approach allows to avoid potentially divisive debates e.g., about defining key concepts, ethical technology uses and codes of conduct.

Following on from the above one may argue that a regulatory approach that will establish as an explicit objective the prevention of a war in outer space (that is, using any technology), while being based on the prohibition of clear harmful outcomes, could govern AI systems (in space) more efficiently. This method would address many current gaps in the OST, whose specific provisions on WMD are poorly suited to the current challenges (Ferreira-Snyman, 2015); especially taking into account that the absence of an agreed definition of space weapons only complicates their practical regulation[45],

[43] United Nations. (1987). Montreal Protocol on substances that deplete the ozone layer. https://clck.ru/3RhNUP

[44] United Nations. (1998). Kyoto Protocol to the United Nations Framework Convention on Climate Change. https://clck.ru/3RhNX3

[45] Mutschler, M. M. (2010). The danger of an arms race in space. In Keeping space safe: Towards a long-term strategy to arms control in space. Peace Research Institute Frankfurt. https://clck.ru/3RhiJd

while the dual-use nature of AI as well as of other space technologies creates additional difficulties[46]. Importantly, adopting –in ISL – the prohibition of specific outcomes, rather than some general rules of conduct, would as well modernize Article IV's ban on WMD to include comparable contemporary threats, like autonomous space weapons systems, while maintaining the OST's fundamental principle that space activities must be conducted "in the interest of maintaining international peace and security" (Art. III). Precisely, such outcome-based regulations should specify the prohibited military applications of AI in space, while explicitly permitting its civilian as well as commercial uses; this distinction would thus protect beneficial AI applications like satellite maintenance, space debris management, and scientific research, safeguarding investments in space (AI) infrastructure. Such approach would also allow to avoid unproductive debates about technology definitions by focusing instead on verifiable threats to security in outer space; it would additionally provide clearer guidelines for compliance than current proposals to regulate AI through ethical principles or programming requirements, which often prove difficult both to agree upon and to enforce. Finally, by creating specific prohibitions on AI-enabled outcomes that could lead to conflict in space, it would pave the way for a more stable security environment in space. At the same time, by delineating the permitted uses, it would encourage continued innovation in peaceful space applications.

Building on this specific approach, the concrete proposal would be to draft and adopt an international treaty with two major components. First, it would reaffirm fundamental principles of international space law, particularly those established in the OST on the peaceful uses of outer space. Second, it would include an annex listing the prohibited uses of AI in space –such as those posing threats to peaceful space activities. This structure would create a balanced framework, allowing to address security risks, while also preserving beneficial AI applications for space exploration. The annex would target AI uses with measurable harmful effects, like the ones generating space debris (to align with Art. IX of the OST), as well as intangible uses of AI, when necessary, like signal jamming. Given the dual nature of AI – i. e., both as a potential weapon and a tool for exploration advancement – the international treaty would require broad international participation, but also consensus. Whether initiated through soft law or best practices, the end goal should be to adopt binding rules of law with clear consequences for violations, to really deter from harmful uses of AI in space.

In this context, to efficiently regulate AI in space while achieving the stated objectives – i.e., preventing threats while permitting beneficial applications, given AI's

[46] International Institute of Space Law. (2024). Balancing innovation and responsibility: International recommendations for AI regulation in space (Report of the Working Group on Legal Aspects of AI in Space). International Institute of Space Law. https://clck.ru/3RhNpc

inherent dual-use nature – establishing a precise typology of prohibited activities and outcomes would be essential. This typology of prohibited outcomes could include e.g., the creation of space debris, enabling lethal signal jamming, operating uncontrolled AI systems in orbit, or causing non-debris related damage. Notably, the framework should additionally ban specific technologies capable of enabling such harmful outcomes, regardless of user(s) intent, thus creating an obligation of result rather than intention. Such an approach would simultaneously help to define fault in space activities, while avoiding the need for States to disclose any sensitive AI research, hence preserving competitive advantages and security concerns. By focusing on concrete prohibitions, this approach would allow to resolve the current legal paradox where AI avoids weapon classification despite its potential for catastrophic harm. Violations of these enumerated AI restrictions would also automatically engage State responsibility under international space law, since such infringements would constitute a fault under Art. VI of the Outer Space Treaty, and Art. III of the Liability Convention (providing much-needed clarity to said provisions; which should, however, by no means imply that State liability would be limited to violations of the prohibited acts listed in this document, or annex). Overall, by mentioning all the banned outcomes rather than focusing on AI technology per se, this type of instrument would allow to prevent harmful consequences.

Conclusions

The growing militarization of space, accelerated by rapid advancements in artificial intelligence (AI) technologies, is one of the most pressing challenges of our times. The existing international law framework, essentially composed of treaties that were negotiated and adopted during the period of the 1960s and 1970s, proves increasingly inadequate to address the complex realities of modern space operations. Indeed, ISL treaties, although progressive when they were drafted, fail to efficiently regulate the inherent dual-use dilemma of space technology, let alone sustainably address the novel complexities introduced by AI. This regulatory gap becomes particularly concerning if we consider that major spacefaring nations are already heavily investing in AI-enabled space technology, while international consensus on basic definitions – such as what constitutes a space weapon – remains elusive.

In reality, the potential of AI in space operations is exceptional; AI enhances space missions in ways that were unimaginable when the ISL treaties were drafted. Importantly though, these same capabilities present significant risks when applied to military applications in space. Precisely, unlike conventional space systems, AI-driven technologies can operate with varying degrees of autonomy, which makes them particularly susceptible to unintended escalation scenarios and potentially catastrophic system failures. At the

same time, specific features of AI may exacerbate these concerns (inter alia, the "black box" nature of machine learning algorithms makes it difficult to predict or explain their decision-making process, while their vulnerability to adversarial manipulation creates new avenues for conflict). Moreover, the speed at which AI can process information and execute commands – far exceeding human reaction times – may dangerously compress decision-making timelines during crises, paving the way to uncertainty as regards the outcomes of space operations in general.

In light of such developments, it is thus evident that Cold War-era ISL needs a few substantial revisions to address AI-enhanced space technology, which is becoming increasingly prevalent. Indeed, the new space paradigm will likely be dominated by technologically advanced nations possessing comparable military capabilities, creating dangerous scenarios of mutual destruction with potentially catastrophic consequences for terrestrial populations. Following on from that, a solution would be to adopt a result-oriented approach. More precisely, rather than attempting to regulate the programming of AI systems – an approach that would quickly become obsolete given the pace of innovation – this new perspective would focus on prohibiting clearly defined harmful outcomes; e. g., the creation of debris, autonomous attacks against space infrastructure, etc. At the same time, it would allow to create verifiable compliance standards (i. e., an approach that is already being used in instruments aimed at avoiding the creation of space debris – see e.g., the IADC guidelines).

Such a regulatory instrument should incorporate two key parts (similarly to major treaties adopted within the context of International Environmental law, that focus on the result to achieve, rather on the effort or intention of States). First, it should reiterate and reaffirm core principles of existing ISL, with an emphasis on ensuring – as a fundamental and non-negotiable objective – the peaceful uses of space, and States' responsibility for their activities. Second, it should additionally establish a binding annex listing prohibited AI behaviors, uses and/or outcomes, rather than attempting (for instance) to regulate their programming. Hence, by focusing on the concrete risks and results that should be avoided, this approach would bypass definitional disputes while also establishing clear compliance standards. Importantly, it would deter conflict by holding the States accountable under existing liability frameworks, as violations of AI outcomes prohibitions would ipso facto constitute a "fault" in outer space – clarifying the application of Art. VI of the Outer Space Treaty (OST) as well as of Article III of the Liability Convention. For a much better impact, such an instrument should be inclusive, based on the participation of both traditional and emerging space actors, private entities etc. Indeed, its effectiveness would, in any case, ultimately depend on enforceable consequences for violations, ensuring compliance rather than mere participation. This

targeted, effects-based approach would balance legal clarity with practical deterrence, addressing urgent threats resulting from harmful uses of AI in space, without however impeding innovation or uses of AI in space that would be beneficial to space operations and to humanity.

The critical importance of the need to regulate the harmful uses of AI in the context of space operations cannot be emphasized enough. While AI has become undoubtedly necessary for space activity, its autonomous nature at the same time creates unprecedented dangers –from unintended escalation to permanent orbital damage –; especially when/if used in the context of hostilities, with the intent to cause damage, since AI uses in space may result in threats that ISL never envisioned. In other words, without rapid intervention, this legal void could trigger an AI arms race, threatening both global security and space sustainability. A pragmatic, effects-based framework would offer a viable path to mitigate risks while still safeguarding AI's benefits for the peaceful exploration and use of space and space resources to the benefit of all.

Reference

Abbas, S. (2025). Challenges to space activities in the context of mega satellite constellations: A focus on environmental impacts. *Journal of Astronomy and Space Sciences*, *42*(1), 1–13. https://doi.org/10.5140/JASS.2025.42.1.1

Aglietti, G. S. (2020). Current challenges and opportunities for space technologies. *Frontiers in Space Technologies*, *1*, Article 1. https://doi.org/10.3389/frspt.2020.00001

Bernat, P. (2019). The inevitability of militarization of outer space. *Safety & Defense*, *5*(1), 49–54.

Berrang, S. (2025). Does the dual-use of space objects necessitate a new Geneva Convention? *Case Western Reserve Journal of International Law*, *57*(1), 315.

Bescheron, J., & Gasnier, P. (2024). Space as warfighting domain: from education to an enhanced global space strategy. *PRISM*, *10*(4), 82–101.

Byers, M., & Boley, A. (2023). Mega-constellations and international law. In *Who owns outer space?: International law, astrophysics, and the sustainable development of space* (pp. 77–113). Cambridge University Press. https://doi.org/10.1017/9781108597135.004

Enholm, M. (2024). The security dilemma and conflict in space: Impossible or inevitable? *Journal of Strategic Security*, *17*(4), 48–70. https://doi.org/10.5038/1944-0472.17.4.2255

Ferreira-Snyman, A. (2015). Selected legal challenges relating to the military use of outer space, with specific reference to Article IV of the Outer Space Treaty. *Potchefstroom Electronic Law Journal*, *18*(3), 1–30. https://doi.org/10.4314/pelj.v18i3.02

Gundersen, K. (2021). Beyond the tardigrades affair: Planetary protection, COSPAR, and the future of private space regulation. *New York University Journal of International Law & Politics*, *53*(3), 871–917.

Hertzfeld, H. R. (2021). Unsolved issues of compliance with the registration convention. *Journal of Space Safety Engineering*, *8*(3), 238–244. https://doi.org/10.1016/j.jsse.2021.05.004

Koskina, A. (2023). The use of AI weapons in outer space: Regulatory challenges. In A. Kornilakis, G. Nouskalis, V. Pergantis, & T. Tzimas (Eds.), *Artificial intelligence and normative challenges*. Springer. https://doi.org/10.1007/978-3-031-41081-9_13

Martin, A.-S., & Freeland, S. (2021). The advent of artificial intelligence in space activities: New legal challenges. *Space Policy*, *55*(3), Article 101408. https://doi.org/10.1016/j.spacepol.2021.101408

Muszyński-Sulima, W. (2023). Cold War in space: Reconnaissance satellites and US-Soviet security competition. *European Journal of American Studies*, *18*(2). https://doi.org/10.4000/ejas.20427

Peperkamp, L. (2020). An arms race in outer space? *Atlantisch Perspectief*, *44*(4), 46–50.

Punnala, M., Punnala, S., Ojala, A., & Kuusniemi, H. (2024). The space economy: Review of the current status and future prospects. In A. Ojala & W. W. Baber (Eds.), *Space business*. Palgrave Macmillan. https://doi.org/10.1007/978-981-97-3430-6_2

Salin, P. A. (1992). Proprietary aspects of commercial remote-sensing imagery. *Northwestern Journal of International Law & Business*, *13*(2), 349.

Saperstein, A. M. (2002). «Weaponization» vs. «Militarization» of space. *APS Physics & Society Newsletter*, *31*(2), 5–7.

Sheer, A., & Shouping, L. (2019). Emergence of the international threat of space weaponization and militarization: Harmonizing international community for safety and security of space. *Frontiers in Management Research*, *3*(3), 56–63. https://dx.doi.org/10.22606/fmr.2019.33003

Shmigol, V. (2022). The United States is enabling an outer space arms race: An overview of the current framework and recommendations for abating an outer space arms race. *Seattle University Law Review*, *46*, 175.

Sönnichsen, A., & Lambach, D. (2020). A developing arms race in outer space? De-constructing the dynamics in the field of anti-satellite weapons. *Sicherheit und Frieden / Security and Peace*, *38*(1), 5–9. https://doi.org/10.5771/0175-274X-2020-1-5

Vansia, D. A. (2024). Role of AI (Artificial Intelligence) in space debris management. *International Journal of Novel Research and Development*, *2024*(35), Article IJNRD2307431.

Author information

Anthi Koskina – PhD, Adjunct Professor of Public International Law, and Space Law, Department of Political Science, School of Social Sciences, Gallos Campus, University of Crete; Scientific Associate at the National Observatory of Athens
Address: 74150 Rethymno, Greece; Lofos Nymphon, PO Box 20048, 11810, Athens, Greece
E-mail: a.koskina@noa.gr
ORCID ID: https://orcid.org/0000-0003-0896-1722
Scopus Author ID: https://www.scopus.com/authid/detail.uri?authorId=57222100332
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Искусственный интеллект и международное космическое право: вызовы двойного назначения

Анти Коскина

Университет Крита, Ретимно, Греция
Афинская национальная обсерватория, Афины, Греция

Ключевые слова

двойное назначение
искусственный интеллект
космическая безопасность
космический мусор
космическое оружие
космическое право
милитаризация космоса
ответственность
право
цифровые технологии

Аннотация

Цель: предложить эффективный правовой механизм регулирования использования искусственного интеллекта в космической сфере с фокусом на предотвращение вредных последствий и сохранение мирного и полезного применения технологий.

Методы: в исследовании использованы метод сравнительно-правового анализа, доктринальная юридическая аргументация и сценарный анализ рисков эскалации; проведен нормативно-исторический анализ основных договоров международного космического права и практик государств, а также сопоставление с подходами международного экологического права, ориентированными на достижение конкретных результатов. Автор дополнительно опирается на анализ прецедентных документов и публичных политических инициатив, иллюстрирующих реальные практики милитаризации и коммерциализации космической инфраструктуры.

Результаты: исследование демонстрирует, что существующие международные договорные механизмы не обеспечивают достаточной регламентации для систем искусственного интеллекта двойного назначения: выявлены пробелы в определениях, кодификации ответственности и механизмах контроля автономных действий. Предложен альтернативный нормативный подход, ориентированный не на регламентацию самой технологии, а на запрет конкретных вредных результатов (образование орбитального мусора, неконтролируемые автономные атаки, подавление сигналов и т. п.). На основе этой логики разработана концепция международного соглашения с обязательным приложением, перечисляющим запрещенные виды использования искусственного интеллекта, и механизмами привлечения государств к ответственности.

Научная новизна: формализован и обоснован с правовой точки зрения результат-ориентированный подход к регулированию искусственного интеллекта в космосе, адаптирующий модель запрещений к современным угрозам двойного назначения; предложены типология запрещенных последствий и связка таких запретов с существующими институтами международной ответственности.

Практическая значимость: предложение служит основой для разработки международного договора или надстройки к международному космическому праву, предоставляет инструмент для национального лицензирования и контроля, облегчает согласование позиций государств и частных операторов и направлено на сохранение инноваций при минимизации рисков для устойчивости космической деятельности.

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Список литературы

Abbas, S. (2025). Challenges to space activities in the context of mega satellite constellations: A focus on environmental impacts. *Journal of Astronomy and Space Sciences*, *42*(1), 1–13. https://doi.org/10.5140/JASS.2025.42.1.1

Aglietti, G. S. (2020). Current challenges and opportunities for space technologies. *Frontiers in Space Technologies, 1*, Article 1. https://doi.org/10.3389/frspt.2020.00001

Bernat, P. (2019). The inevitability of militarization of outer space. *Safety & Defense*, *5*(1), 49–54. https://doi.org/10.37105/sd.43

Berrang, S. (2025). Does the dual-use of space objects necessitate a new Geneva Convention? *Case Western Reserve Journal of International Law*, *57*(1), 315.

Bescheron, J., & Gasnier, P. (2024). Space as warfighting domain: from education to an enhanced global space strategy. *PRISM*, *10*(4), 82–101..

Byers, M., & Boley, A. (2023). Mega-constellations and international law. In *Who owns outer space?: International law, astrophysics, and the sustainable development of space* (pp. 77–113). Cambridge University Press. https://doi.org/10.1017/9781108597135.004

Enholm, M. (2024). The security dilemma and conflict in space: Impossible or inevitable? *Journal of Strategic Security*, *17*(4), 48–70. https://doi.org/10.5038/1944-0472.17.4.2255

Ferreira-Snyman, A. (2015). Selected legal challenges relating to the military use of outer space, with specific reference to Article IV of the Outer Space Treaty. *Potchefstroom Electronic Law Journal*, *18*(3), 1–30. https://doi.org/10.4314/pelj.v18i3.02

Gundersen, K. (2021). Beyond the tardigrades affair: Planetary protection, COSPAR, and the future of private space regulation. *New York University Journal of International Law & Politics*, *53*(3), 871–917.

Hertzfeld, H. R. (2021). Unsolved issues of compliance with the registration convention. *Journal of Space Safety Engineering*, *8*(3), 238–244. https://doi.org/10.1016/j.jsse.2021.05.004

Koskina, A. (2023). The use of AI weapons in outer space: Regulatory challenges. In A. Kornilakis, G. Nouskalis, V. Pergantis, & T. Tzimas (Eds.), *Artificial intelligence and normative challenges*. Springer. https://doi.org/10.1007/978-3-031-41081-9_13

Martin, A.-S., & Freeland, S. (2021). The advent of artificial intelligence in space activities: New legal challenges. *Space Policy*, *55*(3), Article 101408. https://doi.org/10.1016/j.spacepol.2021.101408

Muszyński-Sulima, W. (2023). Cold War in space: Reconnaissance satellites and US-Soviet security competition. *European Journal of American Studies*, *18*(2). https://doi.org/10.4000/ejas.20427

Peperkamp, L. (2020). An arms race in outer space? *Atlantisch Perspectief*, *44*(4), 46–50.

Punnala, M., Punnala, S., Ojala, A., & Kuusniemi, H. (2024). The space economy: Review of the current status and future prospects. In A. Ojala & W. W. Baber (Eds.), *Space business.* Palgrave Macmillan. https://doi.org/10.1007/978-981-97-3430-6_2

Salin, P. A. (1992). Proprietary aspects of commercial remote-sensing imagery. *Northwestern Journal of International Law & Business*, *13*(2), 349.

Saperstein, A. M. (2002). «Weaponization» vs. «Militarization» of space. *APS Physics & Society Newsletter*, *31*(2), 5–7.

Sheer, A., & Shouping, L. (2019). Emergence of the international threat of space weaponization and militarization: Harmonizing international community for safety and security of space. *Frontiers in Management Research*, *3*(3), 56–63. https://dx.doi.org/10.22606/fmr.2019.33003

Shmigol, V. (2022). The United States is enabling an outer space arms race: An overview of the current framework and recommendations for abating an outer space arms race. *Seattle University Law Review*, *46*, 175.

Sönnichsen, A., & Lambach, D. (2020). A developing arms race in outer space? De-constructing the dynamics in the field of anti-satellite weapons. *Sicherheit und Frieden / Security and Peace*, *38*(1), 5–9. https://doi.org/10.5771/0175-274X-2020-1-5

Vansia, D. A. (2024). Role of AI (Artificial Intelligence) in space debris management. *International Journal of Novel Research and Development*, *2024*(35), Article IJNRD2307431.

Сведения об авторе

Анти Коскина – PhD, адъюнкт-профессор публичного международного права и космического права, кафедра политологии, Школа социальных наук, кампус Галлос, Университет Крита; научный сотрудник Афинской национальной обсерватории
Адрес: Греция, 74150, г. Ретимно; Греция, 11810, г. Афины, Лофос Нимфон, а/я 20048
E-mail: a.koskina@noa.gr
ORCID ID: https://orcid.org/0000-0003-0896-1722
Scopus Author ID: https://www.scopus.com/authid/detail.uri?authorId=57222100332
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United Nations Convention on the Prohibition of the Development, Production and Use of Autonomous Weapons Systems

Ildar R. Begishev

Kazan Innovative University named after V. G. Timiryasov, Kazan, Russia

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United Nations Organization

Abstract

Objective: to develop an international legally binding preventive tool establishing a comprehensive ban on the development, production and use of autonomous weapons systems that function without meaningful human control.

Methods: the research is based on an interdisciplinary approach combining methods of comparative-legal analysis of existing international conventions in the field of disarmament; system modeling of the institutional mechanism of implementation; forecasting potential threats to international security; expert consensus in the field of international humanitarian law; and conceptual design of terminological apparatus for differentiating prohibited autonomous and permissible automated weapons systems through the prism of the meaningful human control doctrine.

Results: the work formed an architecture of international legal regulation, including: a legally strict definition of autonomous weapons systems and the concept of meaningful human control; a system of absolute obligations of participating states to prohibit the development, production, acquisition, transfer and use of autonomous systems; imperative requirements for the destruction of existing systems within an eight-month period; an institutional mechanism for the prohibition of autonomous weapons systems; a multi-component verification regime covering national declarations, scheduled and unscheduled inspections; procedures for international cooperation and technical assistance; and mechanisms of legal liability for violations of convention obligations.

Scientific novelty: the work proposes a preventive regime to ban military technologies before their mass deployment, based on the conceptual inadmissibility of delegating decisions on using lethal force to technical systems. This is a qualitatively new approach in the architecture of international disarmament. The category of "meaningful human control", introduced into scholarly-legal discourse, is characterized by criteria of information sufficiency, the possibility of effective intervention and the establishment of responsibility. This creates a regulatory-legal basis for distinguishing legitimate and prohibited weapons systems under technological convergence of artificial intelligence and the military-industrial complex.

Practical significance: the Convention creates the necessary legal conditions to prevent a potentially destabilizing arms race in the field of autonomous systems; to minimize the risks of uncontrolled escalation of armed conflicts; to eliminate gaps in legal responsibility when using lethal force; and to ensure compliance with the fundamental principles of international humanitarian law under technological transformation of the military sphere. The document can be used by the legislative bodies of states while implementing national measures; the diplomatic corps in international negotiations; international organizations while shaping control standards; defense agencies when developing weapons systems; and the scientific community in the field of legal and technical research.

For citation

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Contents

Introduction

At the beginning of the 21st century, humanity faced qualitatively new challenges to global security due to the rapid development of artificial intelligence and robotics technologies in the military sphere. As Kochetkov (2010) rightly points out, changes in approaches to international security at the present stage require a rethinking of traditional legal and ethical paradigms. In this regard, the issue of autonomous weapons systems is of particular interest, since, according to many researchers, they may radically transform the nature of armed conflicts and the very nature of war (Baklanov, 2013; Frolov, 2023). Moreover, as noted in the scientific literature, the integration of artificial intelligence into military technologies poses unprecedented risks to strategic stability and the international law system (Sharikov, 2018; Karasev, 2020).

First of all, it is noteworthy that autonomous weapons systems represent a qualitatively new class of military technologies capable of independently selecting and hitting targets without direct human involvement in deciding whether to use force (Scharre, 2022). Researchers believe that this raises fundamental questions about the compatibility of such systems with the basic principles of international humanitarian law, including the principles of distinction, proportionality and military necessity (Winter, 2022; Ahmed et al., 2026). As Gunawan (2022) showed, the use of autonomous weapons poses serious problems for the implementation of the concept of command responsibility under international criminal law, as the traditional chain of responsibility between the operator, commander and system developer is blurring. One has to emphasize that the issue of legal responsibility for the actions of autonomous systems remains one of the most complex and unresolved in modern legal doctrine (Passinhas, 2018; Baranov, 2020; Miller, 2025).

Analysis of the materials indicates that the development and implementation of combat robots of various classes, from unmanned aerial vehicles to ground-based combat platforms, are becoming global (Yamauchi, 2004; Bhargavi & Manjunath, 2011). The most noticeable progress is in the field of swarm intelligence used in military drones, as was demonstrated in military conflicts (King, 2024). At the same time, humanoid combat robots and autonomous platforms for urban military operations are being actively developed (Uthai et al., 2026). It is very significant that modern military robotics systems are integrated with the Internet of Things, creating comprehensive surveillance and automated response networks (Gopal & Lokesh, 2025; Dhayal et al., 2026). Such systems are used not only in traditional military operations, but also in countering terrorism, as evidenced by Europol materials (Liu et al., 2025). Even in the educational field, there is a trend to introduce combat robots into military training programs for young people, which reflects the systemic militarization of robotics (Zhao et al., 2023).

At the same time, the international legal regulation of autonomous weapons systems remains fragmented and insufficient. As noted in the works by Arbatov (2019) and Mizin (2023), the traditional arms control system faces a deep crisis and needs to adapt to new

technological realities. It is characteristic that states demonstrate different approaches to the need to ban or restrict autonomous weapons (Qerimi, 2023). According to the typology of state positions presented by Qerimi (2023), they range from a complete ban to the absence of any restrictions on the autonomous weapons development. As Agarwal and Singh (2020) show, India takes an intermediate position in this discussion, recognizing the need for certain legal mechanisms while maintaining technological development. It should be noted that the use of autonomous systems in the Ukrainian conflict has raised issues of compliance of such weapons with the norms of international humanitarian law (Mewoh & Rahmadan, 2025).

The conducted studies have shown the existence of significant technical risks associated with the operation of lethal autonomous weapons systems (Podar & Colijn, 2025). According to researchers, these risks include the unpredictable behavior of artificial intelligence systems in unusual situations, vulnerability to cyber attacks, and the possibility of uncontrolled escalation of conflicts. In this regard, characteristic is the statement by Golan (2023) about the need to move from the cybersecurity concept to that of cyber-protection in the context of artificial intelligence systems. It is significant that the integration of artificial intelligence into the military sphere creates new vectors of threats to strategic stability, since autonomous systems can be used for both conventional and nuclear weapons (Sokova, 2020; Stefanovich, 2025). As Sharikov (2018) rightly points out, the combination of artificial intelligence, cyberattacks, and nuclear weapons is dangerous and may destabilize the global security system.

In addition, the militarization of artificial intelligence systems generates a set of ethical problems that go beyond the exclusively legal regulation. It is noteworthy that entitling machines to make decisions about human life and death contradicts fundamental humanistic values and the principle of human dignity (Reichberg & Syse, 2021; Gnatik, 2024). Although some authors, such as Müller (2016), speculate about the potentially positive aspects of autonomous weapons systems, the vast majority of researchers emphasize their threats to humanity. The following points should be highlighted: autonomous weapons systems can transform war into a technical process devoid of moral responsibility; they create the risk of lowering the threshold for entering into armed conflict; they increase the asymmetry between technologically advanced and developing countries (Ruschi, 2020; Rosert & Sauer, 2021).

Along with military-political and ethical-legal aspects, we must verify the fact that the development of military robotics and autonomous systems has significant socio-economic consequences. Research in the field of automation economics indicates the need for government regulation of robotic systems, including discussions on their taxation (Zhang, 2019; Thuemmel, 2023; Carbonara et al., 2024). In relation to the military sphere, this issue is becoming particularly acute, since the weapons automation affects the labor market in the defense industry and changes the employment structure in the armed forces (Prettner & Strulik, 2020; Costinot & Werning, 2023). It should also be

noted that issues of technological confrontation and ensuring military security under the developing convergent technologies require an integrated approach on the part of states (Pankova and Gusarova, 2019; Strelnikov, 2022; Stefanovich, 2025).

As Istyagin (2017) quite rightly notes, a global solution to the problems associated with new weapons technologies is an imperative condition for maintaining international security. In the context of autonomous weapons systems, this means the need to form a universal international legal regime based on a multilateral treaty. As is well known, the mechanism for developing such regimes within the United Nations demonstrated its effectiveness in relation to other categories of weapons that had aroused particular concern of the international community (Annan, 2005). Now let us study the campaigns for the prohibition of certain types of weapons. A comparative analysis of the movements for nuclear disarmament and the prohibition of autonomous weapons conducted by Rosert and Sauer (2021) shows both general patterns and specific features of these processes. At the same time, one should admit that the current arms control crisis poses serious obstacles to achieving international consensus (Brooks et al., 2022; Bogdanov & Yevtodyeva, 2022).

Nevertheless, the analysis of existing legal problems, technological risks and ethical challenges convincingly proves the need to adopt a special international treaty. It follows from the above that such a treaty should contain clear definitions of autonomous weapons systems, criteria for an acceptable level of autonomy, requirements for maintaining meaningful human control over the use of force, and verification and international monitoring mechanisms. Summing up the scientific literature analysis, one can state that the development and implementation of the United Nations Convention on the Prohibition of the Development, Production and Use of Autonomous Weapons Systems is an urgent necessity at the current stage of the international law and global security system development.

1. Explanatory notes to United Nations Convention on the Prohibition of the Development, Production and Use of Autonomous Weapons Systems

The United Nations Convention on the Prohibition of the Development, Production and Use of Autonomous Weapons Systems, the first in the history of international law, was presented to the attention of the diplomatic corps, representatives of international organizations, government agencies, the scientific community, non-governmental organizations and all interested parties. It is a fundamental international legal document designed to prevent potentially irreversible transformations in the nature of warfare.

The transformational processes in the field of military technology, characterized by the rapid development of artificial intelligence and robotics systems, have created an unprecedented challenge to the international legal order, requiring a consolidated response from the world community. As is known, the convergence of advanced technologies and

the military-industrial complex provide the technical possibility of developing autonomous weapons systems operating without meaningful human control. It is interesting in this regard that this circumstance opens up the prospect of a fundamental transformation of the nature of warfare with unpredictable consequences for international security and humanitarian law.

First of all, it is notable that the Convention forms the conceptual and terminological basis for the international legal regulation of autonomous weapons systems. In particular, it defines the parameters of meaningful human control as a fundamental element of the legitimate use of force and establishes absolute prohibitions on the development and production of fully autonomous weapons systems. In addition, it introduces the obligations of states to destroy existing systems, creates an institutional implementation mechanism in the form of an Organization for the prohibition of autonomous weapons systems, and provides effective procedures for verifying compliance with the Convention provisions.

One should mind that the developed Convention is based on a systematic and integrated approach to the preventive regulation of military technologies. It is aimed at forming an international legal regime that ensures the preservation of human control over the use of force as a fundamental principle of international humanitarian law. In other words, the Convention must prevent a qualitative change in the nature of armed conflicts, when decisions about life and death are delegated to autonomous technical systems.

The proposed Convention is an international legally binding instrument aimed at establishing a comprehensive preventive ban on autonomous weapons systems. It should be noted that the document is organically integrated into the existing architecture of international humanitarian law, as well as the fundamental principles of international law relating to human rights and international security.

Moreover, the Convention complies with the United Nations Charter[1], the Geneva Convention and its relevant annexed Protocols[2], the Convention on Prohibitions or Restrictions on the Use of Certain Conventional Weapons Which May Be Deemed to Be Excessively Injurious or to Have Indiscriminate Effects[3], as well as the fundamental principles of international law, human rights, and international security. It is essential that the document creates the necessary legal conditions to prevent a potentially destabilizing arms race and minimize the risks of uncontrolled escalation of conflicts, which is confirmed by the historical experience of preventive regulation of other types of mass destruction weapons.

1 United Nations Charter (full text). https://clck.ru/3SrXAm

2 Geneva Convention and its relevant annexed Protocols. https://clck.ru/3SrXCh

3 The Convention on Prohibitions or Restrictions on the Use of Certain Conventional Weapons Which May Be Deemed to Be Excessively Injurious or to Have Indiscriminate Effects. https://clck.ru/3SrXVQ

It is characteristic that the theoretical base of the Convention relies on the conceptual provision that it is inadmissible to delegate decisions on the lethal force use to technical systems operating outside the limits of meaningful human control. In our opinion, such delegation would inevitably lead to an unacceptable gap in the chain of legal responsibility and would contradict the fundamental principles of distinction, proportionality and precautions, which form the normative basis of international humanitarian law.

We take the liberty to assert that delegating decisions on the use of lethal force to autonomous systems is not only a legal, but also a deep ethical problem affecting the very nature of human responsibility and moral subjectivity in the context of armed conflicts. That is why the Convention proceeds from the imperative requirement of maintaining meaningful human control at all stages of using force.

The Convention structure provides for a clear articulation of the object and subject composition of regulation. The central element is the legal definition of "autonomous weapons systems" as systems capable of independently identifying, selecting and hitting targets without meaningful human control after their activation. At the same time, the Convention establishes a criterion framework for differentiating prohibited autonomous systems and permissible automated systems through the concept of "meaningful human control" characterized by information sufficiency, possible effective intervention, and established responsibility.

The following points should be highlighted: the concept of meaningful human control presupposes not just the formal presence of a person in the control loop, but the actual ability of the operator to understand the context of the system application, make an informed decision and effectively intervene in the process of selecting and defeating targets. Thus, the Convention establishes a functional rather than a technical criterion for distinguishing between permissible and prohibited systems.

The most important thing is that the regulatory system of obligations of the participating states presupposes an absolute ban on the development, production, acquisition, transfer and use of autonomous weapons systems operating without meaningful human control. These obligations are complemented by the imperative requirement to destroy existing systems and implement effective national measures to ensure compliance with the Convention.

In this regard, we must add that the Convention provides for a phased mechanism for fulfilling obligations, including the declaration of existing development programs, the suspension of all work on the creation of prohibited systems, and their subsequent destruction under international control. At the same time, the participating states undertake not to assist, encourage or force other persons to carry out any activity prohibited by the Convention.

One should also note that the institutional mechanism for the Convention implementation is the *ad hoc* Organization for the Prohibition of Autonomous Weapons Systems, whose competence covers compliance monitoring, technical expertise,

and the promotion of international cooperation. At the same time, the Convention verification regime is based on a multi-component system that includes regular declarations, inspections, and special investigations of alleged violations.

At the same time, the Organization functions include coordinating international cooperation in the development of artificial intelligence and robotics technologies for peaceful purposes, facilitating the exchange of scientific and technical information and providing technical assistance to the participating states in the implementation of the Convention. It is essential that the institutional architecture of the Organization ensures a balance between the effective verification and respect for the legitimate interests of states in the field of national security.

It is extremely important that the adoption of the Convention will create the necessary legal conditions to prevent a potentially destabilizing arms race in the field of autonomous systems and minimize the risks of uncontrolled escalation of armed conflicts. As the history of regulating chemical, biological and nuclear weapons shows, preventive regulation helps to avoid the much more complex and resource-intensive task of controlling systems already widespread.

In this regard, it is typical to say that preventing the proliferation of dangerous weapons at the early stages of their technological development is a more effective and less costly approach than attempts to limit systems already deployed. This leads to the conclusion that it was strategically important to adopt the Convention timely, before the autonomous weapons systems reach the stage of mass production and deployment.

It is fair to note that the Convention does not limit the development of artificial intelligence and robotics technologies for peaceful and defense purposes, provided that meaningful human control over the use of force is maintained. This ensures a balance between national security imperatives and fundamental humanitarian values, allowing states to continue technological development in the field of defense without creating unacceptable risks to international security and compliance with humanitarian law.

In other words, the Convention makes a clear distinction between prohibited fully autonomous weapons systems and permissible automated systems operating under meaningful human control. This approach allows preserving technological progress in the defense sector, while simultaneously eliminating the most dangerous and morally unacceptable applications of artificial intelligence for military purposes.

This paper is intended for diplomats, international lawyers, representatives of the legislative and defense sectors, researchers, professors and students, as well as a wide range of readers interested in international security, humanitarian law, and ethical aspects of military technology. It can serve as a basis for diplomatic negotiations, national lawmaking, scientific research and educational programs in the field of international law and technological ethics.

Summing up, one can state that the proposed Convention is the most important tool of preventive international legal regulation aimed at ensuring humane and sustainable

technological development in the interests of maintaining international peace and security of the humanity. Thus, its adoption is not only a legal necessity to fill the existing gap in international law, but also a moral imperative to preserve human dignity and fundamental humanitarian values in the era of rapid technological advancement.

All this convincingly proves the relevance and timeliness of the development of this international legal instrument, which is designed to ensure that technological development in the military sphere remains under human control and serves the purpose of protecting, rather than threatening, fundamental human rights and freedoms.

2. Structure of the United Nations Convention on the Prohibition of the Development, Production and Use of Autonomous Weapons Systems

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3. United Nations Convention on the Prohibition of the Development, Production and Use of Autonomous Weapons Systems

Preamble

The States Parties to this Convention,

Recognizing the devastating consequences of armed conflicts for humanity and the need to prevent such suffering in the future,

Concerned that the rapid development of artificial intelligence, robotics and autonomous systems technologies poses unprecedented threats to international peace, security and stability,

Taking into account the principles and norms of international humanitarian law enshrined in the 1949 Geneva Convention and its annexed Protocols, the 1907 Hague Convention, and other relevant international instruments,

Reaffirming the martens clause, according to which, in cases not provided for by existing agreements, the inhabitants and the belligerents remain under the protection and the rule of the principles of the law of nations, as they result from the usages established among civilized peoples, from the laws of humanity, and the dictates of the public conscience,

Convinced that the conscience of humanity would be deeply shocked by the idea that decisions about life and death can be made by machines without meaningful human control and responsibility,

Recognizing that autonomous weapons systems pose serious ethical, legal, military and diplomatic challenges, including the risks of unpredictable behavior, escalation of conflicts, an arms race and lowering the threshold for the use of force,

Emphasizing that the rules and principles of international humanitarian law, including the principles of distinction, proportionality and precaution, require a contextual understanding and legal assessment that cannot be fully delegated to technical systems,

Recognizing that international law establishes personal responsibility for serious violations of international humanitarian law and that such responsibility cannot be transferred to autonomous systems,

Taking into account the relevant decisions and recommendations of the united nations general assembly, the united nations security council, the conference on disarmament and other international bodies concerning new technologies in the field of armaments,

Welcoming the efforts made by States, international organizations, the International Committee of the Red Cross, non-governmental organizations and civil society to address humanitarian and international security issues that may be caused by autonomous weapons systems,

Determined to act in order to achieve effective progress towards general and complete disarmament under strict and effective international control,

Desiring to promote the implementation of the purposes and principles of the Charter of the United Nations,

Reaffirming the right of each State to the peaceful use of advanced technologies and the obligation of all States to cooperate in establishing an effective system of international control guaranteeing the peaceful use of such technologies,

Have agreed as follows:

Section I

General provisions

Article 1

General obligations

1. Each State Party to this Convention undertakes under any circumstances:

a) not to develop, manufacture, otherwise acquire, accumulate, preserve or transfer autonomous weapons systems to anyone, directly or indirectly;

b) not to use autonomous weapons systems under any circumstances;

c) not to assist, encourage or in any way facilitate anyone to engage in activities prohibited by the States Parties to this Convention;

d) not to use advances in digital technology and artificial intelligence to create systems functionally equivalent to autonomous weapons systems.

2. Each State Party undertakes to destroy or modify all autonomous weapons systems that it possesses or that are under its jurisdiction or control, in accordance with the provisions of this Convention.

3. Each State Party undertakes to ensure that any weapons system under its jurisdiction or control operates under meaningful human control.

Article 2

Definitions and criteria

For the purposes of this Convention:

1. **"Autonomous weapon system"** means any weapon system that is capable of selecting (i.e., searching, identifying, tracking, selecting) and hitting (i.e., using force, neutralizing, damaging, or destroying) targets without meaningful human control and regardless of the degree of technical complexity.

2. **"Meaningful human control"** means the level of human intervention at which people:

a) possess sufficient information and understanding of the functioning of the system and the operational environment;

b) maintain a consistent ability to make informed decisions about the use of force, including timely intervention and deactivation;

c) are responsible for making decisions regarding the use of lethal force;

d) can actively monitor the functioning of the system throughout its application.

3. **"Development"** means all stages prior to industrial production, such as design, research, testing, prototyping, modification of existing systems, and other preparatory activities.

4. **"Manufacturing"** means all stages of manufacture, including design, manufacture, integration, assembly, testing, storage and related activities.

5. **"Acquisition"** means obtaining by any means, including purchase, leasing, loan, technology transfer, or any other form of access to systems or their components.

6. **"Weapon system"** means a warfare means capable of causing damage, harm or destruction, which may include a platform, target detection equipment, control systems, and damaging elements per se.

7. **"Component of an autonomous weapon system"** means any part, element, or subsystem specifically designed to function as an integral part of an autonomous weapon system.

Article 3

Exceptions

1. The following systems are not autonomous weapons systems for the purposes of this Convention:

a) anti-missile, anti-aircraft and anti-artillery defense systems designed solely to protect against inanimate objects (missiles, projectiles, air targets), provided they are under meaningful human control;

b) systems that operate for a limited time and in a limited geographical area under the continuous supervision and control of an operator capable of terminating their operation;

c) mine clearance, search and disposal systems for explosive objects used exclusively for protective and humanitarian purposes;

d) systems that use automation only for moving, navigating, or self-locating functions, but not for selecting and defeating targets;

e) training systems without combat capabilities;

f) non-military systems used for law enforcement, civil, humanitarian, scientific and educational purposes.

2. The Participating States undertake to ensure that systems subject to exceptions cannot be modified to function as autonomous weapons systems.

Section II

Implementation and verification

Article 4

National implementation policies

1. Each State Party shall, in accordance with its constitutional procedures, take the necessary measures to prohibit and prevent any activity prohibited to a State Party to this Convention, carried out anywhere under its jurisdiction or control.

2. Each State Party shall adopt legislative, administrative, judicial and other measures, including the establishment of criminal liability, in order to implement this Convention and comply with its provisions.

3. Each State Party shall prohibit natural and legal persons located on its territory or under its jurisdiction from carrying out any activity prohibited for the States Parties to this Convention.

4. Each State Party shall establish or designate a national authority that shall act as a national focal point for effective communication with other Participating States and the Organization for the Prohibition of Autonomous Weapons Systems. The State Party shall notify the Organization of its national authority upon accession to this Convention.

5. Each State Party shall inform the Organization of the legislative and administrative measures taken to implement this Convention.

Article 5

Declaration and destruction

1. Each State Party, no later than 30 days after the entry of this Convention into force for it, shall declare to the Organization:

a) whether it possesses or owns or has autonomous weapons systems in any territory under its jurisdiction or control;

b) whether it has transferred or received, directly or indirectly, autonomous weapons systems, as well as specifications on any program for the development or production of such systems that it had in place at the time of entry of this Convention into force for it.

2. Each State Party shall, no later than 120 days after the entry of this Convention into force for it, provide the Organization with detailed plans for the destruction or modification of autonomous weapons systems owned or possessed by it, or available in any territory under its jurisdiction or control.

3. All autonomous weapon systems referred to in Paragraph 1 of this Article shall be destroyed or modified no later than 8 months after the entry of this Convention into force, in accordance with the announced destruction or modification plan.

4. Each State Party, during the destruction of autonomous weapons systems, shall ensure the safety of people and the protection of the environment.

5. Each State Party shall cooperate with other Participating States in the exchange of equipment, materials, scientific and technological information on the destruction of autonomous weapons systems.

Article 6

Organization for the Prohibition of Autonomous Weapons Systems

1. The States Parties to this Convention shall establish the Organization for the Prohibition of Autonomous Weapons Systems (hereinafter referred to as the “Organization”) to achieve the objective and goal of this Convention, to ensure the implementation of its provisions, including those relating to international verification of compliance with the Convention, and to provide a forum for consultations and cooperation between the Participating States.

2. The organs of the Organization are:

a) The Conference of the Participating States;

b) The Executive Board;

c) The Technical Secretariat.

3. The Conference of the Participating States (hereinafter referred to as "the Conference") shall consist of all Participating States to the Convention. Each State Party shall have one representative at the Conference, who may be accompanied by alternates and advisers.

4. The first session of the Conference shall be convened by the depositary not later than 30 days after the entry into force of this Convention.

5. The Conference shall meet in regular sessions, which shall be held annually, unless it decides otherwise.

6. The Executive Board (hereinafter referred to as "the Board") shall consist of 41 members. Each Participating State has the right, in accordance with the principle of rotation, to be a Board member. The Board members are elected by the Conference for a two-year term.

7. The Board is the executive body of the Organization. It shall be accountable to the Conference and perform the powers and functions assigned to it by the present Convention.

8. The Technical Secretariat (hereinafter referred to as "the Secretariat") shall assist the Conference and the Board in the performance of their functions. The Secretariat shall carry out the verification measures provided for in the present Convention.

Article 7

Control and verification of compliance

1. In order to verify compliance with the provisions of this Convention, each State Party agrees to monitoring, including:

a) national declarations and reporting;

b) scheduled inspections of facilities;

c) on-demand inspections in case of suspected non-compliance with this Convention;

d) investigation of the alleged use of autonomous weapons systems.

2. Each State Party shall submit to the Organization annual announcements regarding its activities relevant to the objectives of this Convention, including:

a) up-to-date information on its national legislation and administrative measures taken to implement this Convention;

b) a report on developments in artificial intelligence technologies, robotics and autonomous systems related to the military field;

c) information on any military systems being developed or manufactured that have automation elements but are not autonomous weapons systems as defined in this Convention.

3. The Technical Secretariat shall be authorized to carry out inspections in the territory of the Participating States in order to verify compliance with the provisions of this Convention.

4. Each State Party has the right to request an inspection on request in the territory of any other State Party in order to clarify and resolve any issues regarding possible non-compliance with the provisions of this Convention.

5. Inspection teams shall consist of inspectors and assistant inspectors appointed by the Director General from a list of inspectors and assistant inspectors provided by the Participating States.

6. The inspected State Party is obliged to provide access within the inspected territory for the sole purpose of establishing facts relevant to possible non-compliance with the provisions of this Convention.

Section III

Cooperation and assistance

Article 8

Consultations, cooperation and fact-finding

1. The Participating States agree to consult and cooperate with each other in resolving any issues that may arise with respect to the subject matter of this Convention or the implementation of its provisions.

2. Without prejudice to the right of any State Party to request an inspection upon request, the Participating States should, first of all, make every effort to clarify and resolve, through the exchange of information and consultations, any issue that may raise doubts about compliance with this Convention.

3. A State Party that has received a request from another State Party for clarification of any matter deemed to be in doubt or concern shall provide the requesting State Party with sufficient information to clarify the matter no later than 15 days after receiving the request.

4. If the issue is not resolved, the requesting State Party may request an extraordinary session of the Executive Board.

Article 9

International cooperation and technical assistance

1. The Participating States undertake to facilitate the fullest possible exchange of equipment, materials, scientific and technical information for the effective implementation of this Convention.

2. The Organization shall develop and implement programs of cooperation and technical assistance to the Participating States in order to effectively implement the provisions of the Convention.

3. Nothing in this Convention shall be interpreted as limiting or impeding the right of the Participating States to research, develop, produce, acquire, transfer or use scientific knowledge and technology for peaceful purposes.

4. The Participating States undertake to promote international cooperation in the peaceful use of artificial intelligence and robotics technologies, including scientific and technical exchange.

5. The Technical Secretariat shall establish and maintain a database containing information related to the various means of implementing this Convention, as well as information provided by the Participating States.

Article 10
Promoting the development of control technologies

1. The Participating States undertake to develop and improve verification methods, including the creation of standards and criteria for weapons systems with automation elements, in order to ensure a clear distinction between permissible automation and prohibited autonomous systems.

2. The Participating States undertake to cooperate with the Organization in developing guidelines and protocols for inspections and verification.

3. The Organization shall promote the development of technologies and techniques for effective monitoring and verification of compliance with the provisions of this Convention.

Section IV
Other provisions

Article 11
Liability for violations

1. Each State Party shall, in accordance with its constitutional procedures, take the necessary measures to establish criminal liability of natural and legal persons for violations of the prohibitions established by this Convention.

2. With respect to activities prohibited for a State Party to this Convention, each State Party shall, in accordance with international law, establish its jurisdiction when such activities are carried out:

a) in the territory of that State or in any other place under its jurisdiction or control;

b) by any of its citizens;

c) by natural or legal persons directly or indirectly under its control.

3. Persons responsible for serious violations of this Convention shall be prosecuted, regardless of their nationality and place of the violation commission.

Article 12
Relation to other international treaties

1. Nothing in this Convention shall be interpreted as limiting or detracting from the obligations assumed by any State in accordance with the Charter of the United Nations or existing international treaties in the field of disarmament and arms control.

2. This Convention supplements the existing norms of international humanitarian law and international human rights law.

Article 13

Measures to eliminate violations and ensure compliance

1. The Conference, on the recommendation of the Executive Board, shall take the necessary measures to ensure compliance with this Convention and to eliminate and remedy any situation that is contrary to the provisions of the Convention.

2. In cases of particular seriousness, the Conference shall bring the issue, including relevant information and conclusions, to the attention of the United Nations General Assembly and the United Nations Security Council.

Article 14

Terms of duration and withdrawal from the Convention

1. This Convention is open-ended.

2. Each State Party, in the exercise of its national sovereignty, has the right to withdraw from this Convention if it decides that exceptional circumstances relating to the subject matter of this Convention have jeopardized its supreme interests.

3. Withdrawal shall be effected by giving 90 days notice of withdrawal to all other Participating States, the Executive Board, the depositary, and the United Nations Security Council. Such notification shall indicate the exceptional circumstances that the State Party considers to have jeopardized its supreme interests.

Article 15

Status of Annexes

1. The Annexes are an integral part of this Convention. Any reference to this Convention shall include its Annexes.

Article 16

Amendments

1. Any State Party may propose amendments to this Convention. Any State Party may also propose amendments to the Annexes to this Convention.

2. The text of the proposed amendment shall be submitted to the Director General, who shall transmit it to all Participating States and to the depositary. The proposed amendment is considered only by the Amendment Review Conference. Such an Amendment Review Conference shall be convened if one third or more of the Participating States notify the Director General, no later than 30 days after the circulation of the proposal, of their support for further consideration of the proposal.

3. Amendments shall enter into force for all Participating States 30 days after depositing of instruments of ratification or acceptance by all Participating States referred to in Paragraph 1.

Article 17

Registration

1. This Convention shall be registered by the depositary in accordance with Article 102 of the Charter of the United Nations.

Article 18

Authentic texts

1. This Convention, of which the Arabic, Chinese, English, French, Portuguese, Russian and Spanish texts are equally authentic, shall be deposited with the Secretary-General of the United Nations.

Annex I

Technical criteria for defining autonomous weapon systems

1. Technical characteristics of the system indicating its autonomy:

a) the ability to independently determine the parameters of the use of force (time, place, intensity, duration);

b) the ability to independently identify, classify and select targets without direct guidance from a human operator;

c) the ability to adapt one's behavior and make decisions based on changes in the operational environment without explicit human reprogramming;

d) the limited ability of a human to understand the logic of real-time decision-making by the system;

e) the inability of the operator to timely intervene in the decision-making process on the use of force.

2. Technical characteristics that ensure meaningful human control:

a) reliable and secure communication channels between the operator and the system;

b) human-understandable interfaces for managing and displaying information about the system functioning;

c) technical means of emergency shutdown and deactivation available to the operator;

d) software and hardware restrictions that prevent the use of force without the authorization of the operator;

e) means of recording and storing data on all system actions for subsequent analysis.

Annex II

Inspection and verification procedures

1. The procedure for conducting inspections of facilities:

a) notification of the inspected State Party;

b) decision on the inspection team;

c) entry into the territory of the inspected State Party;

d) access to inspected facilities;

e) conducting inspection activities;

f) preparation and submission of an inspection report.

2. Rights and obligations of the inspection team and the inspected State Party:

a) the right of the inspection team to access relevant facilities and information;

b) the right of the inspected State Party to protect confidential information unrelated to the goals of the inspection;

c) the obligation of inspectors to carry out activities with minimal interference to the normal functioning of facilities;

d) the obligation of the inspected State Party to provide assistance to the inspection team.

Annex III

Confidentiality of information

1. Principles for the treatment of confidential information:

a) protection of confidential information obtained by the Organization in the course of the implementation of this Convention;

b) ensuring that confidentiality requirements do not impede effective verification of compliance with the Convention;

c) establishing levels of confidentiality of information and appropriate access procedures;

d) liability for breach of confidentiality.

2. Procedure for handling confidential information:

a) collection, processing, storage and transfer of confidential information;

b) access of the Organization's personnel to confidential information;

c) protection of facilities and confidential data;

d) procedures in case of violation or alleged violation of confidentiality.

In witness whereof, the undersigned, being duly authorized thereto, have signed this Convention.

Committed on "___" _____ in a single copy in the Arabic, Chinese, English, French, Russian and Spanish languages, all texts being equally authentic.

Conclusions

The presented United Nations Convention on the Prohibition of the Development, Production and Use of Autonomous Weapons Systems is an innovative preventive international legal instrument, designed to prevent a qualitative transformation of the nature of armed conflicts in the era of technological convergence of artificial intelligence and the military sphere.

The conceptual significance of the proposed document lies in the formation of a normative paradigm based on the imperative of maintaining human control over decisions on the use of deadly force. The introduction of the "meaningful human control" category into international legal circulation with clearly defined criteria of information sufficiency, as well as the possibility of effective intervention and establishing responsibility, creates a fundamental basis for differentiating legitimate automated systems and prohibited autonomous weapons systems.

The structural architecture of the Convention provides comprehensive regulation of the entire life cycle of autonomous weapons systems, from a ban on development to an imperative requirement to destroy existing systems within an eight-month period. The creation of a specialized institutional mechanism in the form of an Organization for the Prohibition of Autonomous Weapons Systems and the establishment of a multi-component verification regime guarantee effective implementation and monitoring of compliance with the Convention obligations.

The preventive nature of legal regulation reflects a qualitatively new approach in international disarmament law, which makes it possible to preempt a potentially destabilizing arms race before the mass deployment of appropriate technologies. The historical experience of regulating chemical, biological and nuclear weapons strongly suggests that the establishment of prohibitions at the initial stages of technological development is much more effective than attempts to control already widespread systems.

The proposed document organically integrates into the existing system of international humanitarian law, supplementing the norms of the 1949 Geneva Convention and its annexed Protocols, as well as the 1981 Convention on Prohibitions or Restrictions on the Use of Certain Conventional Weapons. The Convention extends the Martens Clause onto the latest military technologies, confirming that in cases not covered by existing agreements, combatants and civilians remain protected by the principles of international law and the requirements of humanity.

The practical implementation of the Convention provisions will help minimize the risks of uncontrolled escalation of armed conflicts, eliminate gaps in the chain of legal responsibility when using deadly force, and ensure compliance with the fundamental principles of distinction, proportionality, and precaution under the technological transformation of the military sphere.

At the same time, one should note that the effectiveness of the proposed international legal regime will crucially depend on the political will of States to universalize the Convention; on reaching consensus among the leading military powers on the parameters of prohibitions and exceptions; and on the ability of the verification mechanism to adapt to the rapid development of relevant technologies.

The Convention does not limit the development of artificial intelligence and robotics technologies for peaceful and defense purposes, provided that meaningful human control is maintained. This ensures the necessary balance between national security imperatives and fundamental humanitarian values. The document creates the legal basis for responsible technological development, putting a human and their dignity at the center of the military technology evolution.

The adoption of this Convention by the international community would be a historic achievement of preventive diplomacy in the field of disarmament and an essential contribution to ensuring sustainable and humane technological development in the interests of maintaining international peace and human security.

References

Agarwal, A., & Singh, A. (2020). Killer robots or soldiers of the future: Legal issues and India's role in the lethal autonomous weapons debate. *Indian Journal of Law and Technology*, *16*(2), 104–128.

Ahmed, O. S., Abdulmajeed, E. N., Abdullah, O. A.-H., Sajid, W. A., Al Hilfi, Th. K. Yu., Gluschenko, Y. (2026). Autonomous Weapons Systems Under International Humanitarian Law: A Legal–Ethical and Data-Driven Analysis of Modern Warfare. In: Z. Molamohamadi, E. Babaee Tirkolaee, A. Mirzazadeh, Weber, G.-W. (Eds.), *Optimization and Data Science in Industrial Engineering. ODSIE 2025. Communications in Computer and Information Science* (vol 2855, pp. 160–178). Springer, Cham. https://doi.org/10.1007/978-3-032-17023-1_9

Annan, K. (2005). "Under broader freedom": time of decisions in UNO. *Russia in Global Affairs, 3*(4), 8–20. (In Russ.).

Arbatov, A. G. (2019). Dreams and realities of arms control. *World Economy and International Relations*, *63*(11), 5–16. (In Russ.). https://doi.org/10.20542/0131-2227-2019-63-11-5-16

Baklanov, A. (2013). A war of the future. *Russia in Global Affairs*, *11*(4), 126–136.

Baranov, P. P. (2020). Problems of legal regulation of robotics and artificial intelligence. *Vestnik Volgogradskogo gosudarstvennogo universiteta. Series 5: Jurisprudence*, *25*(1), 123–135. http://dx.doi.org/10.20511/pyr2020.v8n2.511

Bhargavi, S., & Manjunath, S. (2011). Design of an intelligent combat robot for war fields. I*nternational Journal of Advanced Computer Science and Applications*, *2*(8), 64–69.

Bogdanov, K. V., & Yevtodyeva, M. G. (2022). Lethal autonomous weapon systems: landscape and perspectives. *Polis. Political studies*, *6*, 67–80. (In Russ.). https://doi.org/10.17976/jpps/2022.06.06

Brooks, R., Golby, J., & Urben, H. (2022). Crisis of command. *Rossia v Globalnoy Politike*, *20*(3), 178–190. https://doi.org/10.31278/1810-6439-2022-20-3-178-190

Carbonara, E., Focacci, C. N., & Santarelli, E. (2024). Mitigating the labor displacing effects of automation through a robot tax: evidence from a survey experiment. *Economics of Innovation and New Technology*, *33*(8), 1145–1158. https://doi.org/10.1080/10438599.2023.2293031

Costinot, A., & Werning, I. (2023). Robots, trade, and Luddism: A sufficient statistic approach to optimal technology regulation. *Review of Economic Studies*, *90*(5), 2261–2291.

Dhayal, D., Aggarwal, P., Ansari, M. (2026). IntelliGuard: IoT-Enabled Autonomous Spybot Intelligence for Real-Time Surveillance in Next-Generation Security Applications. In: Trabelsi, M., Khan, M., Bouida, Z., Murugappan, M. (eds) *Proceedings of the 2nd Symposium on Smart, Sustainable, and Secure Internet of Things. S4IoT 2025. Lecture Notes in Electrical Engineering*, vol 1513. Springer, Singapore. https://doi.org/10.1007/978-981-95-5136-1_16

Frolov, A. L. (2023). Future wars and their technical dimension. *Rossia v Globalnoy Politike*, *21*(1), 88–98. https://doi.org/10.30884/vglob/2022.01.11

Gnatik, E. N. (2024). Militarization of artificial intelligence systems: opportunities and threats. *RUDN Journal of Philosophy*, *28*(3), 771–784. (In Russ.). https://doi.org/10.22363/2313-2302-2024-28-3-771-784

Golan, G. (2023). A new age of cyber: transitioning from security to safety. Computer Fraud & Security, 2023(8). https://doi.org/10.12968/s1361-3723(23)70036-5

Gopal, K. V., & Lokesh, H. (2025). Smart surveillance and combat robot for defense applications. *International Advanced Research Journal in Science, Engineering and Technology*, *12*(5). https://doi.org/10.17148/IARJSET.2025.125374iarjset

Gunawan, Y. (2022). Command responsibility of autonomous weapons under international criminal law. *Cogent Social Sciences*, *8*(1), Article 2139906. https://doi.org/10.1080/23311886.2022.2139906

Istyagin, L. G. (2017). Imperative condition for global resolution. *World Economy and International Relations*, *61*(9), 121–127. (In Russ.). https://doi.org/10.7868/S013122271709012X

Karasev, P. A. (2020). Cyber factors of strategic stability. *Russia in Global Affairs*, *18*(3), 24–52. (In Russ.). https://doi.org/10.31278/1810-6374-2020-18-3-24-52

King, A. (2024). Robot wars: Autonomous drone swarms and the battlefield of the future. *West European Politics*. Advance online publication. https://doi.org/10.1080/01402390.2024.2302585tandfonline

Kochetkov, V. V. (2010). Changes in approaches to the international security at the beginning of the 21st century. *Lomonosov Political Science Journal*, *4*, 30–35. (In Russ.).

Liu, D., Rikhtehgar Berenji, H., Gupta, S., & Chai, R. (2025). Synergy in Counter-Terrorism: Airstrikes, Ground Attacks and Civilian Evacuations in Diverse Topologies. *Production and Operations Management*, *34*(9), 2540–2559.

Mewoh, G., & Yanuar Rahmadan. (2025). Russia's Use of Autonomous Weapon Systems: An Analysis of Offensive Military Policy in the 2022–2024 Russia-Ukraine War. *Politeia : Journal of Public Administration and Political Science and International Relations*, *3*(4), 237–252. https://doi.org/10.61978/politeia.v3i4.684

Miller, S. (2025). Lethal autonomous weapon systems (LAWS): meaningful human Control, collective moral responsibility and institutional design. *Ethics and Information Technology*, *27*, 63. https://doi.org/10.1007/s10676-025-09874-x

Mizin, V. I. (2023). The unsolved issue of arms control: anti-missile dilemma. *Social Sciences and Contemporary World*, *1*, 68–82. (In Russ.). https://doi.org/10.31857/S0869049923010057

Müller, V. C. (2016). Autonomous killer robots are probably good news. In E. Di Nucci & F. Santoni de Sio (Eds.), *Drones and responsibility: Legal, philosophical and sociotechnical perspectives on the use of remotely controlled weapons* (pp. 67–81). Ashgate. https://doi.org/10.4324/9781315578187-4

Pankova, L. V., & Gusarova, O. V. (2019). Innovation-technological breakthroughs: influence on the arms control. *World Economy and International Relations*, *63*(6), 70–83. (In Russ.). https://doi.org/10.20542/0131-2227-2019-63-6-70-83

Passinhas, S. (2018). Robotics and law: A survey. In *Proceedings of the 5th International Conference on Physiological Computing Systems* (pp. 43–52). CEUR Workshop Proceedings.

Podar, H., & Colijn, A. (2025). Technical risks of (lethal) autonomous weapons systems [Preprint]. *arXiv*.

Prettner, K., & Strulik, H. (2020). Technology, robots, and the future of work: A macroeconomic analysis. *Macroeconomic Dynamics*, *24*(5), 1153–1185.

Qerimi, Q. (2023). Controlling lethal autonomous weapons systems: A typology of the position of states. *Computer Law & Security Review*, *49*, Article 105797. https://doi.org/10.1016/j.clsr.2023.105854

Reichberg, G. M., & Syse, H. (2021). Applying AI on the battlefield: The ethical debates. In C. Hasse & S. Thieffry (Eds.), *Robotics, AI, and Humanity* (pp. 147–159). Springer. https://doi.org/10.1007/978-3-030-54173-6_12

Rosert, E., & Sauer, F. (2021). How (not) to stop the killer robots: A comparative analysis of the campaigns for nuclear and autonomous weapons disarmament. *Contemporary Security Policy*, *42*(1), 41–70. https://doi.org/10.1080/13523260.2020.1771508

Ruschi, F. (2020). The rise of drones and the transformation of warfare: A view from philosophy of international law. *Revista de Estudos Constitucionais, Hermeneutica e Teoria do Direito*, *12*(1). https://doi.org/10.4013/rechtd.2020.121.08

Scharre, P. (2022). *The legality and accountability of autonomous weapon systems*. Cambridge University Press. https://doi.org/10.1017/9781009090001

Sharikov, P. (2018). Artificial intelligence, cyberattack, and nuclear weapons – A dangerous combination. *Bulletin of the Atomic Scientists*, *74*(6), 368–373. https://doi.org/10.1080/00963402.2018.1533185

Sokova, E. (2020). Disruptive technologies and nuclear weapons. *New Perspectives*, *28*(3), 292–297. https://doi.org/10.1177/2336825x20934975

Stefanovich, D. V. (2025). Disruptive technologies as a source of strategic destabilization. *Rossia v Globalnoy Politike*, *23*(1), 10–23. (In Russ.). https://doi.org/10.31278/1810-6439-2025-23-1-10-23

Strelnikov, D. O. (2022). Problems of developing convergent technologies and ensuring military security of the Russian Federation. *Vek Globalizatsii*, *1*(41), 152–159. https://doi.org/10.30884/vglob/2022.01.11

Thuemmel, U. (2023). Optimal taxation of robots. *Journal of the European Economic Association*, *21*(3), 1154–1190. https://doi.org/10.1093/jeea/jvac062asil

Uthai T., You H., Wang M., Smith K., Spackman E., Ryan Z., Li Sh., Du J. (2026). Opportunities challenges and roadmap for humanoid robots in construction. *Scientific Reports*, *16*, 905. https://doi.org/10.1038/s41598-025-30252-6

Winter, M. N. (2022). The Compatibility of Autonomous Weapons with the Principles of International Humanitarian Law. *Journal of Conflict & Security Law*, *27*(1), 1–25. https://doi.org/10.1093/jcsl/krac001

Yamauchi, B. M. (2004). PackBot: A versatile platform for military robotics. In G. R. Gerhart, C. M. Shoemaker, & D. W. Gage (Eds.), *Defense and security* (pp. 209–215). SPIE. https://doi.org/10.1117/12.538328

Zhang, P. (2019). Automation, wage inequality and implications of a robot tax. *Japan and the World Economy*, *51*, Article 100959. https://doi.org/10.1016/j.iref.2018.10.013

Zhao, J., Yin, B., Zeng, Z., Yuan, P., & Li, Y. (2023). Application and exploration of competitive combat robot technology in engineering education. In 2023 IEEE 12th International Conference on Engineering Education (ICEED) (pp. 148–152). IEEE. https://doi.org/10.1109/ICEED59801.2023.10264004s.

Author information

Ildar R. Begishev – Dr. Sci. (Law), Associate Professor, Honored Lawyer of the Republic of Tatarstan, Chief Researcher of Scientific-Research Institute of Digital Technologies and Law, Professor of the Department of Criminal Law and Procedure, Kazan Innovative University named after V. G. Timiryasov
Address: 42 Moskovskaya Str., 420111 Kazan, Russia
E-mail: begishev@mail.ru
ORCID ID: https://orcid.org/0000-0001-5619-4025
Scopus Author ID: https://www.scopus.com/authid/detail.uri?authorId=57205305394
WoS Researcher ID: https://www.webofscience.com/wos/author/record/637461
Google Scholar ID: https://scholar.google.com/citations?user=Ny2WbHIAAAAJ
RSCI Author ID: https://elibrary.ru/author_items.asp?authorid=595003

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Конвенция Организации Объединенных Наций о запрещении разработки, производства и применения автономных систем вооружения

Ильдар Рустамович Бегишев

Казанский инновационный университет имени В. Г. Тимирясова, Казань, Россия

Ключевые слова

автономная робототехника,
автономная система вооружения,
безопасность человечества,
значимый человеческий контроль,
искусственный интеллект,
международная безопасность,
международное гуманитарное право,
Организация Объединенных Наций,
право,
цифровые технологии

Аннотация

Цель: разработать международный юридически обязывающий инструмент превентивного характера, устанавливающий всеобъемлющий запрет на разработку, производство и применение автономных систем вооружения, функционирующих без значимого человеческого контроля.

Методы: исследование базируется на междисциплинарном подходе, сочетающем методы сравнительно-правового анализа существующих международных конвенций в сфере разоружения, системного моделирования институционального механизма имплементации, прогнозирования потенциальных угроз международной безопасности, экспертного консенсуса в области международного гуманитарного права, а также концептуального конструирования терминологического аппарата для дифференциации запрещенных автономных и допустимых автоматизированных систем вооружения через призму доктрины значимого человеческого контроля.

Результаты: сформирована архитектура международно-правового регулирования, включающая: юридически строгую дефиницию автономных систем вооружения и концепцию значимого человеческого контроля; систему абсолютных обязательств государств-участников по запрету разработки, производства, приобретения, передачи и применения автономных систем; императивные требования уничтожения существующих систем в восьмимесячный срок; институциональный механизм организации по запрещению автономных систем вооружения; многокомпонентный верификационный режим, охватывающий национальные декларации, плановые и внеплановые инспекции; процедуры международного сотрудничества и технической помощи; механизмы юридической ответственности за нарушения конвенционных обязательств.

Научная новизна: разработан превентивный режим запрета военных технологий до их массового развертывания, основанный на концептуальном положении о недопустимости делегирования решений о применении смертоносной силы техническим системам, что представляет качественно новый подход в архитектуре международного разоружения. Введена в научно-правовой оборот категория «значимого человеческого контроля», характеризующаяся критериями информационной достаточности, возможности эффективного вмешательства и установления ответственности, что создает нормативную правовую основу для разграничения правомерных и запрещенных систем вооружения в условиях технологической конвергенции искусственного интеллекта и военно-промышленного комплекса.

Практическая значимость: конвенция создает необходимые правовые условия для предотвращения потенциально дестабилизирующей гонки вооружений в сфере автономных систем, минимизации рисков неконтролируемой эскалации вооруженных конфликтов, устранения разрывов в цепи юридической ответственности при применении смертоносной силы, обеспечения соблюдения фундаментальных принципов международного гуманитарного права в условиях технологической трансформации военной сферы. Документ предназначен для использования законодательными органами государств при имплементации национальных мер, дипломатическим корпусом в процессе международных переговоров, международными организациями при формировании стандартов контроля, оборонными ведомствами при разработке систем вооружения, научным сообществом в области юридических и технических исследований.

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Список литературы

Аннан, К. (2005). «При большей свободе»: время решений в ООН. *Россия в глобальной политике*, *3*(4), 8–20. https://www.elibrary.ru/XCENOD

Арбатов, А. Г. (2019). Грезы и реальности контроля над вооружениями. *Мировая экономика и международные отношения*, *63*(11), 5–16. EDN: https://www.elibrary.ru/MGRVXW. DOI: https://doi.org/10.20542/0131-2227-2019-63-11-5-16

Богданов, К. В., Евтодьева, М. Г. (2022). Смертоносные автономные системы вооружения: ландшафт и перспективы. *Полис. Политические исследования*, *6*, 67–80. EDN: https://www.elibrary.ru/BVGCYC. DOI: https://doi.org/10.17976/jpps/2022.06.06

Брукс, Р., Голби, Д., Урбен, Х. (2022). Кризис командования. *Россия в глобальной политике*, *20*(3), 178–190. EDN: https://www.elibrary.ru/FBRWSK. DOI: https://doi.org/10.31278/1810-6439-2022-20-3-178-190

Гнатик, Е. Н. (2024). Милитаризация систем искусственного интеллекта: возможности и угрозы. *Вестник Российского университета дружбы народов. Серия: Философия*, *28*(3), 771–784. EDN: https://www.elibrary.ru/VZSWGK. DOI: https://doi.org/10.22363/2313-2302-2024-28-3-771-784

Истягин, Л. Г. (2017). Императивное условие глобального решения. *Мировая экономика и международные отношения*, *61*(9), 121–127. EDN: https://www.elibrary.ru/ZFMGFL. DOI: https://doi.org/10.7868/S013122271709012X

Карасев, П. А. (2020). Кибер-факторы стратегической стабильности. *Россия в глобальной политике*, *18*(3), 24–52. EDN: https://www.elibrary.ru/JSVRIZ. DOI: https://doi.org/10.31278/1810-6374-2020-18-3-24-52

Кочетков, В. В. (2010). Изменения в подходах к международной безопасности в начале XXI века. *Вестник Московского университета. Серия 12: Политические науки*, *4*, 30–35. https://www.elibrary.ru/MXSLHX

Мизин, В. И. (2023). О нерешенном аспекте контроля над вооружениями: противоракетная дилемма. *Общественные науки и современность*, *1*, 68–82. EDN: https://www.elibrary.ru/NPHGQN. DOI: https://doi.org/10.31857/S0869049923010057

Панкова, Л. В., Гусарова, О. В. (2019). Инновационно-технологические прорывы: влияние на систему контроля над вооружениями. *Мировая экономика и международные отношения*, *63*(6), 70–83. EDN: https://www.elibrary.ru/CULGBO. DOI: https://doi.org/10.20542/0131-2227-2019-63-6-70-83

Стефанович, Д. В. (2025). Многомерное поле технологического противоборства. *Россия в глобальной политике*, *23*(1), 10–23. EDN: https://www.elibrary.ru/HDFKYG. DOI: https://doi.org/10.31278/1810-6439-2025-23-1-10-23

Стрельников, Д. О. (2022). Проблемы развития конвергентных технологий и обеспечение военной безопасности Российской Федерации. *Век глобализации*, *1*(41), 152–159. EDN: https://www.elibrary.ru/SFLPXW. DOI: https://doi.org/10.30884/vglob/2022.01.11

Фролов, А. Л. (2023). Войны будущего и их техническое измерение. *Россия в глобальной политике*, *21*(1), 88–98. EDN: https://www.elibrary.ru/XFQSWS. DOI: https://doi.org/10.31278/1810-6439-2023-21-1-88-98

Agarwal, A., & Singh, A. (2020). Killer robots or soldiers of the future: Legal issues and India's role in the lethal autonomous weapons debate. *Indian Journal of Law and Technology*, *16*(2), 104–128.

Ahmed, O. S., Abdulmajeed, E. N., Abdullah, O. A.-H., Sajid, W. A., Al Hilfi, Th. K. Yu., Gluschenko, Y. (2026). Autonomous Weapons Systems Under International Humanitarian Law: A Legal–Ethical and Data-Driven Analysis of Modern Warfare. In: Z. Molamohamadi, E. Babaee Tirkolaee, A. Mirzazadeh, Weber, G.-W. (Eds.), *Optimization and Data Science in Industrial Engineering. ODSIE 2025. Communications in Computer and Information Science* (vol 2855, pp. 160–178). Springer, Cham. https://doi.org/10.1007/978-3-032-17023-1_9

Baklanov, A. (2013). A war of the future. *Russia in Global Affairs*, *11*(4), 126–136. https://www.elibrary.ru/SJIMNJ

Baranov, P. P. (2020). Problems of legal regulation of robotics and artificial intelligence. *Vestnik Volgogradskogo gosudarstvennogo universiteta. Series 5: Jurisprudence*, *25*(1), 123–135. http://dx.doi.org/10.20511/pyr2020.v8n2.511

Bhargavi, S., & Manjunath, S. (2011). Design of an intelligent combat robot for war fields. *International Journal of Advanced Computer Science and Applications*, *2*(8), 64–69.

Carbonara, E., Focacci, C. N., & Santarelli, E. (2024). Mitigating the labor displacing effects of automation through a robot tax: evidence from a survey experiment. *Economics of Innovation and New Technology*, *33*(8), 1145–1158. https://doi.org/10.1080/10438599.2023.2293031

Costinot, A., & Werning, I. (2023). Robots, trade, and Luddism: A sufficient statistic approach to optimal technology regulation. *Review of Economic Studies*, *90*(5), 2261–2291.

Dhayal, D., Aggarwal, P., Ansari, M. (2026). IntelliGuard: IoT-Enabled Autonomous Spybot Intelligence for Real-Time Surveillance in Next-Generation Security Applications. In: Trabelsi, M., Khan, M., Bouida, Z., Murugappan, M. (eds) *Proceedings of the 2nd Symposium on Smart, Sustainable, and Secure Internet of Things. S4IoT 2025. Lecture Notes in Electrical Engineering*, vol 1513. Springer, Singapore. https://doi.org/10.1007/978-981-95-5136-1_16

Golan, G. (2023). A new age of cyber: transitioning from security to safety. *Computer Fraud & Security*, *2023*(8). EDN: https://www.elibrary.ru/YWJTKG. DOI: https://doi.org/10.12968/s1361-3723(23)70036-5

Gopal, K. V., & Lokesh, H. (2025). Smart surveillance and combat robot for defense applications. *International Advanced Research Journal in Science, Engineering and Technology*, *12*(5). https://doi.org/10.17148/IARJSET.2025.125374iarjset

Gunawan, Y. (2022). Command responsibility of autonomous weapons under international criminal law. *Cogent Social Sciences*, *8*(1), Article 2139906. EDN: https://www.elibrary.ru/OOLMLD. DOI: https://doi.org/10.1080/23311886.2022.2139906

King, A. (2024). Robot wars: Autonomous drone swarms and the battlefield of the future. *West European Politics*. Advance online publication. https://doi.org/10.1080/01402390.2024.2302585tandfonline

Liu, D., Rikhtehgar Berenji, H., Gupta, S., & Chai, R. (2025). Synergy in Counter-Terrorism: Airstrikes, Ground Attacks and Civilian Evacuations in Diverse Topologies. *Production and Operations Management*, *34*(9), 2540–2559.

Mewoh, G., & Yanuar Rahmadan. (2025). Russia's Use of Autonomous Weapon Systems: An Analysis of Offensive Military Policy in the 2022–2024 Russia-Ukraine War. *Politeia : Journal of Public Administration and Political Science and International Relations*, *3*(4), 237–252. https://doi.org/10.61978/politeia.v3i4.684

Miller, S. (2025). Lethal autonomous weapon systems (LAWS): meaningful human Control, collective moral responsibility and institutional design. *Ethics and Information Technology, 27*, 63. https://doi.org/10.1007/s10676-025-09874-x

Müller, V. C. (2016). Autonomous killer robots are probably good news. In E. Di Nucci & F. Santoni de Sio (Eds.), *Drones and responsibility: Legal, philosophical and sociotechnical perspectives on the use of remotely controlled weapons* (pp. 67–81). Ashgate. https://doi.org/10.4324/9781315578187-4

Passinhas, S. (2018). Robotics and law: A survey. In *Proceedings of the 5th International Conference on Physiological Computing Systems* (pp. 43–52). CEUR Workshop Proceedings.

Podar, H., & Colijn, A. (2025). Technical risks of (lethal) autonomous weapons systems [Preprint]. *arXiv*.

Prettner, K., & Strulik, H. (2020). Technology, robots, and the future of work: A macroeconomic analysis. *Macroeconomic Dynamics*, *24*(5), 1153–1185.

Qerimi, Q. (2023). Controlling lethal autonomous weapons systems: A typology of the position of states. *Computer Law & Security Review*, *49*, Article 105797. EDN: https://www.elibrary.ru/XPUTAK. DOI: https://doi.org/10.1016/j.clsr.2023.105854

Reichberg, G. M., & Syse, H. (2021). Applying AI on the battlefield: The ethical debates. In C. Hasse & S. Thieffry (Eds.), *Robotics, AI, and Humanity* (pp. 147–159). Springer. https://doi.org/10.1007/978-3-030-54173-6_12

Rosert, E., & Sauer, F. (2021). How (not) to stop the killer robots: A comparative analysis of the campaigns for nuclear and autonomous weapons disarmament. *Contemporary Security Policy*, *42*(1), 41–70. EDN: https://www.elibrary.ru/VFWYWL. DOI: https://doi.org/10.1080/13523260.2020.1771508

Ruschi, F. (2020). The rise of drones and the transformation of warfare: A view from philosophy of international law. *Revista de Estudos Constitucionais, Hermeneutica e Teoria do Direito*, *12*(1). EDN: https://www.elibrary.ru/YHVLWC. DOI: https://doi.org/10.4013/rechtd.2020.121.08

Scharre, P. (2022). *The legality and accountability of autonomous weapon systems*. Cambridge University Press. https://doi.org/10.1017/9781009090001

Sharikov, P. (2018). Artificial intelligence, cyberattack, and nuclear weapons – A dangerous combination. *Bulletin of the Atomic Scientists*, *74*(6), 368–373. EDN: https://www.elibrary.ru/XYNIVX. DOI: https://doi.org/10.1080/00963402.2018.1533185

Sokova, E. (2020). Disruptive technologies and nuclear weapons. *New Perspectives*, *28*(3), 292–297. EDN: https://www.elibrary.ru/TDMLYH. DOI: https://doi.org/10.1177/2336825x20934975

Thuemmel, U. (2023). Optimal taxation of robots. *Journal of the European Economic Association*, *21*(3), 1154–1190. EDN: https://www.elibrary.ru/UJCKJS. DOI: https://doi.org/10.1093/jeea/jvac062asil

Uthai T., You H., Wang M., Smith K., Spackman E., Ryan Z., Li Sh., Du J. (2026). Opportunities challenges and roadmap for humanoid robots in construction. *Scientific Reports*, *16*, 905. https://doi.org/10.1038/s41598-025-30252-6

Winter, M. N. (2022). The Compatibility of Autonomous Weapons with the Principles of International Humanitarian Law. *Journal of Conflict & Security Law*, *27*(1), 1–25. EDN: https://www.elibrary.ru/SFCQBK. DOI: https://doi.org/10.1093/jcsl/krac001

Yamauchi, B. M. (2004). PackBot: A versatile platform for military robotics. In G. R. Gerhart, C. M. Shoemaker, & D. W. Gage (Eds.), *Defense and security* (pp. 209–215). SPIE. https://doi.org/10.1117/12.538328

Zhang, P. (2019). Automation, wage inequality and implications of a robot tax. *Japan and the World Economy*, *51*, Article 100959. https://doi.org/10.1016/j.iref.2018.10.013

Zhao, J., Yin, B., Zeng, Z., Yuan, P., & Li, Y. (2023). Application and exploration of competitive combat robot technology in engineering education. In 2023 IEEE 12th International Conference on Engineering Education (ICEED) (pp. 148–152). IEEE. https://doi.org/10.1109/ICEED59801.2023.10264004

Сведения об авторе

Бегишев Ильдар Рустамович – доктор юридических наук, доцент, заслуженный юрист Республики Татарстан, главный научный сотрудник Научно-исследовательского института цифровых технологий и права, профессор кафедры уголовного права и процесса, Казанский инновационный университет имени В. Г. Тимирясова
Адрес: 420111, Россия, Казань, ул. Московская, 42
E-mail: begishev@mail.ru
ORCID ID: https://orcid.org/0000-0001-5619-4025
Scopus Author ID: https://www.scopus.com/authid/detail.uri?authorId=57205305394
WoS Researcher ID: https://www.webofscience.com/wos/author/record/637461
Google Scholar ID: https://scholar.google.com/citations?user=Ny2WbHIAAAAJ
РИНЦ Author ID: https://elibrary.ru/author_items.asp?authorid=595003

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Legal Aspect of Cyberaddiction Among Youth: Digital Risks and Peventive Measures

Marina V. Alekseeva ✉
Don State Technical University, Rostov-on-Don, Russia

Svetlana V. Rybak
Don State Technical University, Rostov-on-Don, Russia

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law,
legal education,
moral values,
prevention

Abstract

Objective: to substantiate the need for an integrative approach to legal and spiritual-moral education of young people under digitalization of society; to develop a scientifically based model for the prevention and correction of cyberaddictive be-havior by synthesizing legal, pedagogical and ethical components.

Methods: the research uses a set of theoretical and empirical methods, includ-ing dialectical and systematic approaches, analysis and synthesis, modeling and forecasting. Comparative-legal and historical legal analysis was applied to study the evolution of legislation in the field of digital security. The authors conducted an in-terdisciplinary analysis of the achievements of computer science, sociology, psy-chology and pedagogy and used a system-structural approach to study the interac-tion of government structures, educational and civil society institutions.

Results: the study revealed significant fragmentation of legislation and the ab-sence of federal digital hygiene programs, which hinders the formation of legal awareness among young people. The authors proposed a definition of cyberaddic-tive behavior as a complex personal and legal deviation affecting the basic behavior-al norms and indicating a crisis of the value system. They developed a conceptual model to form the “digital immunity” of youth, integrating legal regulation, educa-tional technologies, and psychological support. Key areas of improvement identified are the adoption of special legislative initiatives, the introduction of programs for the development of digital legal culture, and the creation of interdepartmental mecha-nisms for early diagnosis and correction of digital deviations.

✉ Corresponding author

Scientific novelty: the work conceptualizes cyberaddiction as a multidimen-sional legal and value challenge of the digital generation. An interdisciplinary model of education was developed that takes into account the transformation of legal con-sciousness under digitalization. New definitions of key concepts were proposed, as well as a systematic approach to the prevention of pathological forms of digital be-havior. "Digital socialization" was conceptualized as a special area of legal educa-tion.

Practical significance: the results obtained are applicable in educational pro-grams and standards; for developing the course "Fundamentals of digital legal cul-ture"; for training accredited specialists in cyberaddiction prevention; for creating in-terdepartmental digital hygiene programs at the national, departmental and educa-tional levels. The proposed measures contribute to the formation of critical thinking, digital literacy, self-regulation skills and resistance to manipulation in cyberspace among young people.

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Contents

Introduction

For the new era of human civilization, characterized by the transition from the information society to the digital network, lifestyle transformations are similar to the changes of geological epochs in the history of the Earth. Radical changes in human existence became a reality due to the third industrial revolution, which naturally led to the formation of a new

structure of social relations, determined by the total integration of digital technologies into everyday life. The result of this technological leap was not only the massive spread of digital devices, but also the formation of a complex digital space in which new forms of social interaction and socialization are increasingly replacing or transforming traditional mechanisms of social experience.

One of the key problems of the digital age is the emerging cyberaddiction among youth, which has led to the need for comprehensive legal measures aimed at reducing digital risks and preventing pathological addiction. The legal regulation of the use of digital media requires a deep interdisciplinary rethink, combining the achievements of psychology, medicine, pedagogy and law to form effective algorithms for the prevention of digital addiction and ensure the rights of the younger generation.

1. Cyberaddiction as a socio-cultural and legal phenomenon in the modern educational environment

1.1. Theoretical foundations of the cyberaddiction phenomenon: signs, forms and interpretations

In the modern research and educational paradigm, the problem of legal education and the formation of spiritual and moral requirements in the digital age is gaining not only theoretical, but also key practical significance (Rybak & Krygina, 2019), due to the radical transformation of the social environment under intensive digitalization. The digital progress leads to the emergence of new forms of socio-cultural identity, forming unique models of thinking, communication and behavior among youth. According to modern researchers, it is adolescence that becomes a critically sensitive period during which legal norms and moral-ethical guidelines are assimilated and consolidated (Vygotsky, 2005), while the rapidly developing cyberspace acquires the status of a key socialization agent.

Hence, it is scientifically relevant to conduct an integrative analysis of cyberspace and cyberaddiction issues not only within the framework of information security, but also through the prism of legal socialization and spiritual-moral development of the individual. This is because the modern educational environment is unable to comprehensively form the legal and digital culture among young people, which is most clearly expressed in the absence of federal programs for digital hygiene and legal education. This gap is associated with the growth of cyberaddictive, deviant behaviors among young people.

E. Spranger noted that “youth is a period in which it is more important than ever for a person to be understood by others. It is at this age that deep perception and acceptance from other people become the basis for a full-fledged personality formation. However, in practice, there are often various circumstances that hinder or completely exclude the possibility of such mutual understanding” (Spranger, 2014; Erickson, 1996). This reasoning allows us to conclude that vulnerability towards the outside world and

its influence is especially acute in adolescence. One of the external factors that has a significant impact is cyberspace. It may seem an exceptionally useful resource that can solve many social and psychological problems of young people, including lack of live communication or dissatisfaction with their own appearance. However, this perception often turns out to be deceptive and superficial (Lazar, 2018).

The scientific novelty of the research lies in conceptualizing the synthesis of legal educational methods with mechanisms for the formation of stable moral values among young people under the spread of digital services. Modern sources interpret cyber risks as a complex category that goes beyond technological threats and includes legal, ethical, and cultural aspects of protection (Kovrov, 2015). Legal analysis of cyber threat issues requires the formation of a multi-level system of spiritual, moral and legal coordinates in educational institutions aimed at developing a culture of legal reflection and immunity to destructive and extremist content.

1.2. Analysis of the situation in the Russian educational and legal reality

The task of legal education and the formation of spiritual and moral guidelines for young people under digitalization is gaining not only theoretical, but also pronounced practical significance. The active introduction of digital technologies has a complex impact on the mechanisms of socialization, the development of legal self-awareness, and the resistance to deviant online behavior.

Modern scientific publications by both Russian and foreign authors (M. Spitzer, V. V. Kovrov, T. F. Gayu, A. S. Trubitsyn) point to the complex-structured nature of the cyberaddiction phenomenon, and also emphasize the need for an integrative approach to the prevention of digital deviations. This is due to the fact that unilateral methods – informational, legal or technical – are not effective enough. Strategies that combine legal education with the development of critical thinking, self-regulation, and assimilation of ethical standards[1] are considered the most effective (Soldatova et al., 2011). In the foreign practice (Germany, Singapore, South Korea), the introduction of digital hygiene programs together with legal and psychological support has decreased the prevalence of Internet addiction among young people.

The Russian educational sphere faces an insufficient institutionalization of legal regulation of digital education systems: there are no uniform federal standards of digital hygiene, educational and upbringing programs are fragmented, and the level of legal literacy among young people remains low (Bekirov, 2023). Analyzing these aspects, one

[1] Malygin, V. L. (2010). Internet-dependent behavior in adolescents. Clinic, diagnosis, and prevention: a handbook for school psychologists. Moscow: “Arsenal obrazovaniya” Information and Methodological Center. https://clck.ru/3Suzx3

can conclude that the identified deficits generate additional risks of cyberaddiction, reduced legal responsibility, individual autonomy and trust in society.

The authors' position interprets cyberaddiction as a complex personal and legal deviation affecting the basic norms of behavior and indicating a crisis of the value system and an insufficiently formed digital identity. The scientific significance of this work lies in the theoretical justification of the need for a holistic model of digital education that combines legal, pedagogical, psychological and ethical components.

The study analyzed theoretical doctrines, as well as modern scientific works on digital behavior and manifestations of deviance in the Internet (Drepa, 2009). This approach made it possible to identify the most important trends and comprehensively evaluate existing methods of preventing cyber dependence. Using the system-structural method, we studied the interaction between government, educational and civil society institutions involved in the formation of digital culture and the prevention of Internet-dependent behaviors.

Using logical analysis, we clarified the term "cyberaddiction". The method of comparative analysis and the historical-legal approach allowed tracing the development of legislative and educational initiatives aimed at preventing cyberaddiction. The scientific and practical significance of the research lies in the formation of an innovative pedagogical space aimed at educating individuals who are able not only to adapt to the digital era, but also to actively build their behavior in accordance with the legal and ethical norms of society. The most important part of the authors' approach to solving this problem is the model developed for forming digital immunity in schoolchildren. It integrates the system of legal regulation, educational technologies, psychological practices and interdisciplinary cooperation of teachers, parents, and students. The model implies creating a system of regular trainings and interactive educational modules aimed at developing critical thinking, digital literacy, and the ability to analyze and consciously regulate one's behavior in a digital environment. The results obtained substantiate the need to move from the concept of passive protection to a model of active formation of digital immunity and positive patterns of behavior. This requires further integration of scientific knowledge and educational practice for the harmonious development of the younger generation under the rapid digital transformation.

The modern so-called digital society is characterized by the fact that its structure and functioning are organized primarily through digital platforms and online communities. The young generation are brought up in an information space unique to the history of mankind, which significantly affects the formation of their thinking and behavioral patterns.

M. Spitzer's monograph "Anti-brain: digital technologies and the brain" calls for a conscious and balanced use of digital devices and the Internet, without setting out to completely abandon electronic means of communication. The author reasonably

highlights the positive potential of cyberspace: “thanks to digital technologies, a person gets the opportunity to instantly engage in dialogue regardless of geography, to study remotely, to self-actualize in creativity, to find the necessary information in a matter of seconds, and to plan leisure time according to their own preferences” (Spitzer, 2014). Such advantages allow talking about a significant expansion of a modern person’s individual and professional horizons. However, addressing the issue comprehensively, the researcher also pays attention to the negative consequences of excessive and uncritical handling of the online environment. He considers the main threat to be the phenomenon of digital dementia, which implies a decrease in intellectual abilities, simplification of thinking and difficulties in critical analysis of information. In addition, Spitzer emphasizes that virtual communication is gradually replacing real one, which leads to a shortage of emotional contacts. Vulnerability of personal data, deteriorated health, limited physical activity and the formation of cyber dependence are also among the risks. Reduced independence, narrowing of the range of hobbies and loss of self–regulation skills are also the alarming symptoms of the digital age.

In our opinion, not only individual, but also public and social threats of digitalization are often underestimated. Automation of processes and pervasive control lead to an almost complete disappearance of privacy, and a person finds oneself under constant digital surveillance, which calls into question basic personal freedoms.

Of particular concern is that the modern educational system is often unable to fully provide schoolchildren and students with the necessary level of legal and digital literacy and, more importantly, with full-fledged legal and moral education in the digital sphere. The absence of a federal educational program on digital hygiene correlates with a high prevalence of cyberaddiction and other deviant models of online behavior among young people.

Addiction (from the Latin “addico”, meaning “giving over”) is interpreted as a pathological, obsessive a predilection for an occupation or object and can be considered as a form of pathological behavior that deviates from established social and cultural norms. The current state of the cyberaddiction (or cyber dependence) problem, especially among young people, is becoming increasingly important socially and legally under the society digitalization. An analysis of scientific sources confirms that the range of interpretations of this phenomenon is quite wide. However, almost all authors agree that this is a pathological form of attraction to the use of digital technologies, accompanied by a decreased time control, alienation from social and educational institutions, and a preferred escape into virtual space to the detriment of real interaction. For example, A. S. Trubitsyn defines cyber dependence as “a pathological propensity to use computer and mobile technologies” (Trubitsyn, 2017). T. F. Gayu emphasizes the individual’s inability to resist this urge, noting the psychological component of cyberaddiction – the desire to experience relief through escape into a digital environment (Gayu, 2019).

Modern research demonstrates an extremely wide range of cyber-dependent behavior. These are compulsive web surfing, addiction to virtual communication, online games (including gambling), streaming audio-visual content, and cybersex (Greenfield, 2018).

In pedagogical and legal discourse, cyberaddiction is defined as a stable, psychologically conditioned dependence of a subject on virtual interaction, arising against the background of undeveloped competencies of self-regulation, lack of targeted educational and legal impact. We propose to consider cyberaddiction not as a special case of abuse of digital resources, but as a complex personal and social deviation capable of transforming the value-normative foundations of personality, which requires interdisciplinary scientific understanding.

The legal aspect of the problem under study goes far beyond individual deviations and touches upon such issues as forming legal consciousness and culture of information behavior of an individual. Today, legal education should include elements of digital literacy and ethics, and form a stable legal identity that can withstand the risks of the digital environment, such as cyberbullying, cybercrime, and privacy violation. Of particular importance is the integration of spiritual and moral attitudes and legal responsibility into the process of shaping digital behavior. .

The scientific and practical significance of studying cyberaddiction, taking into account legal, educational, spiritual and moral principles, is expressed in the need to develop multi-level educational, preventive and regulatory mechanisms aimed at preventing pathological forms of digital behavior, as well as at forming a legal culture of responsible and ethical use of information society opportunities among youth. This approach is conceptually novel, as it allows combining the personal, cultural-moral and legal aspects of socialization in the cyber environment. This opens up prospects for developing new models of legal education in the context of digital transformation of education and society.

2. Legal aspects and prevention of digital addiction

2.1. Legal problems and legislative gaps in the field of digital addiction

The current legal framework in the field of digital behavior of minors and youth is characterized by significant fragmentation and insufficiently deep regulation of phenomena related to cyberaddiction. Despite a number of federal laws regulating personal data (Federal Law No. 152-FZ of 27.07.2006)[2], education (Federal Law No. 273-FZ

[2] On personal data. No. 152-FZ of 27.07.2006 (latest version). (2006). SPS KonsultantPlyus. https://clck.ru/3RXtbw

of 29.12.2012)[3], and information security (Federal Law No. 149-FZ of 27.07.2006)[4], the current legislation lacks the concept and legal criteria of cyberaddiction. The mechanisms of its early prevention, legal and social correction for young people are also not determined.

An important legal problem is the lack of special procedures for the diagnosis and recognition of persons suffering from cyberaddiction who need help from educational or medical institutions. This impedes timely identification of digital risks and provision of individual correction routes of a civil-legal and educational nature.

In addition, in practice there is a significant gap between the requirements of legislative acts, which declare general principles of digital security, and specific algorithms for legal and pedagogical prevention of cyber dependence. For example, the current regulation is mainly focused on information protection, rather than on ensuring the legal and moral development of a person in a digital environment (Khamidullin & Chub, 2023).

At the intersection of legal and educational interests, there is a question of the legal status of digital educational environments in which teenagers spend a lot of time. The uniform standards of digital ethics, terms of responsibility of educational institutions, and clear restrictive and stimulating norms are lacking. This leads to the situation when cyberaddiction is prevented unsystematically and does not achieve the target of forming sustainable models of digital behavior among young people.

It is particularly difficult to distinguish cyberaddiction from other forms of deviant behavior for the purposes of legal regulation. This creates risks of unjustified interference in the private lives of young citizens or, conversely, underestimation of the scale of the problem during preventive measures.

Insufficient protection of minors' rights to information autonomy and the right to protection from malicious content on the Internet is becoming an acute problem. The existing content filtering mechanisms are either technically imperfect or not supported by the relevant educational and legal programs that form a competent user of digital services. The current judicial practice in disputes related to the dissemination of harmful information, cyberbullying and other digital deviations is being formed unevenly, requiring unified methodological approaches and clarifications from the highest judicial authorities.

The existing regulatory framework often does not keep pace with the digital change or provide a sufficient level of protection for subjects of digital interaction, especially in the aspect of personal data (Bokova, 2023). Today, there is a need to institutionalize and standardize the integrative concept of legal education, from the axiological (value)

[3] On education in the Russian Federation. No. 273- FZ of 29.12.2012 (latest version). (2012). SPS KonsultantPlyus. https://clck.ru/3RXteY

[4] On information, information technologies and information protection. No. 149- FZ of 27.07.2006 (latest version). (2006). SPS KonsultantPlyus. https://clck.ru/3RXtfn

component to forming systemic competencies for conscious and ethically responsible behavior in the digital environment (Popov, 2024).

The information society is characterized by uneven digital socialization, as well as fragmented legal and ethical guidelines. This, in turn, generates additional risks associated with the massive development of pathological forms of digital behavior, including cyberaddiction (Trubitsyn, 2017). Currently, the legal regulation of the digital behavior of minors and youth is characterized by noticeable fragmentation and superficiality in matters related to cyber dependence. Today, cyber dependence is positioned not only as a behavioral pathology, but also as an indicator of a lack of legal awareness, a reduced level of internal value regulation, and deficient digital ethics (Vlasov, 2023). We propose to consider cyberaddiction not only as a special case of impaired digital behavior, but also as a multidimensional personal and social deviation which determines the transformation of a system of universally recognized values and norms.

A legal analysis of foreign practice demonstrates that countries with a developed regulatory system and holistic digital prevention programs show more successful results in preventing cyberaddiction and other deviant digital practices (Mazur & Li, 2016). In our opinion, in relation to Russia, the state strategy should be aimed at creating interdepartmental programs for digital hygiene and legal education, developing reflexive and volitional mechanisms that allow not only formal knowledge of the laws, but also mastering the value practices of responsible behavior in the digital environment.

We propose to define cyberculture as a unity of legal, moral, communicative and digital competence integrated into the practices of self-development, reflection and critical choice. It can serve not only as a means of preventing cyber addiction, but also as a universal model of a stable personality capable of self-regulation, autonomy and high social responsibility in an era of continuous digital development.

We believe that the formation of cyberculture should become a systematic element of educational programs at universities, especially in law schools, where special attention is paid to the prevention of deviant behavior among young people with future special (professional) status. The modern education system requires a comprehensive transformation: the introduction of standards of digital ethics, the launching of cyberaddiction prevention programs, the strengthening of moral and legal self-control mechanisms, the formation of positive patterns, and the development of critical thinking, taking into account national and global challenges.

2.2. Model for forming digital immunity and responsible behavior

As a scientific perspective and the area of further theoretical and empirical research, we recommend that researchers form a unified model of legal and moral education of youth, providing for the integration of digital, legal and value competencies, the instrumental use of digital services to form adequate models of self-reflection, legal culture and

internal moral regulation among young people. In the scientific community, cyber risks are defined not only as technological threats, but also as a multidimensional legal phenomenon. For example, V. V. Kovrov argues that "risks in the digital environment are not only sources of external danger to an individual, but objectively existing opportunities for harm that require legal regulation, as well as systematic measures for legal education and the formation of adaptive digital ethics of users" (Kovrov, 2015). In our opinion, while analyzing cyber threats, the legal task should be comprehensively linked to the task of forming a system of spiritual and moral guidelines in the educational space, manifested in a culture of communication, the ability to legal reflection, perception of legal norms and immunity to destructive content.

The period of adolescence is a unique window of opportunity and temporarily a zone of vulnerability for the formation of the value and legal framework of a personality (Lopez-Fernandez & Kuss, 2020). It is at this age that instances of addictive behavior become frequent, including digital addiction. It requires a revision of approaches to education: the focus should shift not only to informing about dangers, but also to developing skills of critical self-assessment, digital self-management, and the ability to moral self-reflection. The problem is gaining a pronounced legal dimension, since cyber threats to youth are associated with legislative gaps, insufficient protection of the rights of personal data subjects, and the lack of a unified strategy for legal education in the digital environment (Kuss et al., 2021).

The term "digital socialization" as a process of assimilation of social experience through ICT (Soldatova, 2018) today requires deconstruction, taking into account the risks of pathological forms of Internet activity, such as online addiction, cyberbullying, computer-game addiction and other manifestations of deviant behavior. Effective counteraction to cyberaddiction requires the concept of digital socialization, which is based on a transdisciplinary approach – the synergy of legal, medical and social mechanisms (Bazhanov, 2016).

Modern problems of cyberaddiction are becoming particularly acute due to the phenomenon of hyperconnection (van Krieken, 2024). Research shows that, for example, Russian teenagers and young adults have already reached 8–10 hours per day in the digital environment (Soldatova et al., 2017). G. S. Salistaya has come to similar conclusions (Salistaya, 2025). Such dynamics, combined with a decrease in age restrictions on the use of gadgets, raises not only psychological, but also legal questions: what is the degree of responsibility of the state, society and digital platforms in creating an environment conducive to addictive behavior?

Legal analysis of cyberaddiction among youth requires a systematic approach to the responsibility of various actors and institutions, including the state, digital companies, educational organizations, and parents. In many countries, legislation already contains special legal mechanisms for the protection of minors on the Internet: filtering content, limiting the online time, requirements for parental consent, introduction of age labeling

of programs and applications (Seidov, 2025). However, the effectiveness of these measures is limited without extensive educational and preventive work, as well as without coordinated activities of all stakeholders.

One of the effective preventive measures is the use of legal tools in conjunction with digital education and psychological support programs. The introduction of special educational modules to form digital literacy and conscious behavior on the Internet, as well as special consulting services on digital addiction, is an essential element of the digital prevention policy (Mossberger et al., 2006). Since the "new reality" is characterized by dynamics and variability, legal norms in this area must be flexible, not only prevent extreme manifestations of addiction, but also be proactive towards deviant Internet behavior and form stable patterns of safe and responsible digital socialization.

2.3. Development prospects and ways to improve legal regulation

Possible ways to improve the legal regulation of the problem under study include a number of proposals. One of the effective preventive measures is the use of legal tools in conjunction with digital education and psychological support programs. The introduction of special educational modules to form digital literacy and conscious behavior on the Internet, as well as special consulting services on digital addiction, is an essential element of the digital prevention policy (Mossberger et al., 2006). It seems rational to introduce into the education system the mandatory legal component "Fundamentals of digital legal culture", focused on the assimilation of norms of behavior on the Internet, the development of critical self-assessment and digital self-restraint skills. The integration of differentiated digital security courses, standards for the conscious use of digital services and interaction in online communications will expand the opportunities for the formation of sustainable legal behaviors among adolescents.

Among the priorities are the expansion of the institutional functions of school and university mediation services, the creation of a register of accredited psychologists and lawyers with expertise in the field of cyberaddiction prevention. The introduction of interdepartmental digital health support programs, the integration of educational institutions with legal counseling centers will make it possible to quickly respond to manifestations of digital deviations and provide the necessary legal and psychological assistance.

Since the "new reality" is characterized by dynamics and variability, legal norms in this area must be flexible. They should not only prevent extreme manifestations of addiction, but also be proactive towards deviant Internet behavior and form stable patterns of safe and responsible digital socialization.

The problem of cyberaddiction also requires the development of reliable diagnostic legal criteria that define the line between active digital behavior and legally significant addiction, which is necessary for the objective consideration of controversial cases in judicial and administrative practice. In this context, of particular importance is

interdepartmental cooperation between the law enforcement and educational systems, the healthcare industry and the digital business.

It is also becoming an essential task to develop special legal standards for digital platforms, which require the mandatory implementation of technical solutions to limit online time, warn about risks, and provide anonymous access to help for teenagers. At the level of law enforcement practice, monitoring and adaptation of legislation is necessary, taking into account the constantly changing digital landscape.

An important area of legislation improvement is ensuring the right of youth to safe development in the digital environment. It is necessary to form a package of state guarantees and procedures to protect the rights of minors and young citizens in case of abuse of digital services (Alekseeva et al., 2020).

As part of the strategy for the digital transformation of society, monitoring and consolidated analysis of new types of digital deviations is necessary in order to update existing regulations in advance, develop and implement regulatory documents that protect the rights and interests of children and adolescents on the Internet.

Summarizing the above, one can state: the problem of educating young people under the digital revolution is of legal nature, it requires constructing a unified model of digital and legal education, in which spiritual and moral guidelines will become an integral part and a key method for the sustainable formation of immunity to the destructive effects of the digital environment. Only an integrated, interdisciplinary approach combining legal literacy with moral education can ensure the safe adaptation of youth to the new digital realities and thereby increase their resistance to cyber risks and addictive manifestations.

Conclusions

The conducted research proves that adolescence is characterized by increased susceptibility to social and informational influences, which means that it requires a particularly attentive approach to methods of education, prevention and correction of deviant digital behavior. In modern conditions, successful adaptation of youth to the realities of a digital society is impossible without an interdisciplinary synthesis of legal education, spiritual and moral education and the development of critical self-assessment skills.

The practical value of the research lies in the development of interdepartmental digital hygiene and legal education programs for secondary and higher education systems. The proposed approach can be integrated into educational standards and contribute to improving the professional training of teachers and forming a system of continuous legal education in a digital environment. This, in turn, enhances the development of digital responsibility, legal awareness, reflexive skills and resistance to manipulation in cyberspace among young people. In general, the conducted research

expands the scientific understanding of the phenomena of cyberaddiction and digital deviation. It allows considering educational measures as a set of interdisciplinary strategies that ensure the formation of a responsible, independent and legally conscious personality in the digital age. We see further steps to be an empirical assessment of the implemented programs' effectiveness, a study of new forms of digital risks, and a refinement of models of legal regulation and education that correspond to the modern social dynamics.

Considering the problem of cyberaddiction among youth, we propose the following emendated definition: cyberaddictive (or cyber-dependent) behavior is a stable form of deviant strategies, when the individual is included in the virtual space due to the total reduction of significant social, educational and legal contacts, accompanied by systematic disregard for the moral and legal norms of real society and a decrease in the ability to self-restraint. At the same time, according to the fair remark by I. S. Kon, the manifestation of one form of deviant behavior greatly increases the likelihood of involvement in other deviations, which indicates the complexity of cyber dependence as a socio-cultural phenomenon that follows universal patterns of deviant behavior[5]. Cyberaddictions among young people should be understood as a complex value and legal challenge that requires the consolidation of efforts by the state, educational organizations and the scientific community. Effective counteraction to pathological patterns of digital behavior is possible only with a systematic synthesis of legal education, spiritual and moral practices and personalized prevention programs. It allow forming a generation of conscious, law-governed and responsible individuals under the rapid digitalization of society.

In this context, of particular importance is the development of early prevention programs aimed at developing critical thinking among youth, resistance to manipulation in the digital environment, as well as the skills of self-organization and responsible use of the Internet. It is necessary to support initiatives that encourage young people to participate consciously and creatively in digital culture, project activities, volunteer and creative Internet projects aimed at developing social, ethical and legal competencies.

The implementation of such programs is impossible without the active participation of teachers, psychologists, parents and the young people. The interdisciplinary cooperation, creation of educational ecosystems focused not only on the knowledge transfer, but also on the formation of values, is becoming an important condition for successfully countering cyberaddiction. In addition to educational institutions, a special role is assigned to mass media and digital platforms, which should be responsible for distributing reliable and useful information, limiting harmful content and promoting positive Internet practices.

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[5] Kon, I. S. (1989). Psychology of early youth: tutorial. Moscow: Prosveshcheniye. https://clck.ru/3RXubZ

An important prospect for further research is the analysis of the effectiveness of implemented measures to prevent and correct cyberaddiction among youth, as well as the identification of new social, legal and moral risks associated with the emergence of innovative digital technologies. This requires constant monitoring of the digital practices of youth and flexible adaptation of educational programs, and above all, legal education, taking into account rapidly changing realities. In the long term, under digitalization of society, the integration of legal and moral education can create conditions for the formation of a mature, responsible and socially active young generation, capable not only of using digital technologies for their personal interests, but also of effectively countering the threats of cyberaddiction, while preserving fundamental humanistic values.

The phenomenon of cyberaddiction requires the development of a modern integrated legal policy, coupled with the reform of educational standards and the introduction of ethical and legal programs. The latter should aim at developing among youth not only high digital literacy competencies, but also sustainable values of law-abiding, responsibility, and the ability to resist manipulation and negative influences of the digital environment. Only a crosscutting, interdisciplinary approach combined with a point-by-point adjustment of legislation can lay the prerequisites for the formation of a mature personality and reduce the level of cyberaddiction among young people.

References

Alekseeva, M., Podroykina, I., & Isakova, Yu. (2020). Legal basis for the use of educational technologies in the knowledge information space formation. *Innovative Technologies in Science and Education, ITSE*, 2020, 18005.

Bazhanov, V. (2016). On the phenomenon of transdisciplinary scientific revolution. In V. Bazhanov, R. W. Scholz (Eds.), *Transdisciplinarity in philosophy and science. Approaches. Problems. Prospects* (pp. 136–144). Moscow: Navigator. (In Russ.).

Bekirov, S. N. (2023). Legal validity of youth education in the conditions of digitalization. *Problemy Sovremennogo Pedagogicheskogo Obrazovaniya*, *78-2*, 36–39. (In Russ.).

Bokova, L. N. (2023). Legal Issues of Protection Personal Data of Citizens in the Digital Space. *Bulletin of Moscow City Pedagogical University. Series: Legal Sciences*, *1*(49), 41–48. (In Russ.). https://doi.org/10.25688/2076-9113.2023.49.1.04

Drepa, M. I. (2009). Internet dependence as an object of scientific reflection in contemporary psychology. *Knowledge. Understanding. Skill*, *2*, 189–193. (In Russ.).

Erikson, E. (1996). *Identity: Youth and Crisis*. Moscow: Progress. (In Russ.).

Gayu, T. F. (2019). The decrease in the level of communication skills: the genesis of the problems of cybersafefamily the younger generation. *Problemy Sovremennogo Pedagogicheskogo Obrazovaniya*, *63-4*, 53–56. (In Russ.).

Greenfield, S. (2018). *A Day in the Life of the Brain: The Neuroscience of Consciousness from Dawn till Dusk*. Saint Petersburg: Piter. (In Russ.).

Khamidullin, R. S., & Chub, D. S. (2023). Cybersecurity policy of modern education *Политика кибербезопасности современного образования. Law and Politics*, *4*, 48–60. (In Russ.). https://doi.org/10.7256/2454-0706.2023.4.39997

Kovrov, V. V. (2015). Threats and risks of aggression and violence in the person-to-person interaction of adolescents: social-psychological aspect. *Obrazovaniye i Nauka v Sovremennykh Usloviyakh*, *3*, 173–177. (In Russ.).

Kuss, D. J., Kristensen, A. M., & Lopez-Fernandez, O. (2021). Internet Addictions Outside of Europe: A Systematic Literature Review. *Comput. Hum. Behav.*, *115*(1), 106621. https://doi.org/10.1016/j.chb.2020.106621

Lazar, M. G. (2018). Digitalization of Society, Its Consequences and Population Control. *Problemy Deyatelnosti Uchenogo i Nauchnykh Collectivov*, *4*(34), 170–181.

Lopez-Fernandez, O., & Kuss, D. J. (2020). Preventing Harmful Internet Use-Related Addiction Problems in Europe: A Literature Review and Policy Options. *Int. J. Environ. Res. Public Health*, *17*, 37–97. https://doi.org/10.3390/ijerph17113797

Mazur, E., & Li, Y. (2016). Identity and Self-Presentation on Social Networking Web Sites: A Comparison of Online Profiles of Chinese and American Emerging Adults. *Psychology of Popular Media Culture*, *5*(2), 101–118.

Mossberger, K., Tolbert, C. J., & Gilbert, M. (2006). Race, place and information technology. *Urban Affairs Review*, *41*(5), 583–620. https://doi.org/10.1177/1078087405283511

Popov, P. M. (2024). Educational Policy in the Field of Prevention of Cyberaddiction among Young People. *Gumanitarnye Nauki (Yalta)*, *4*(68), 16–22. (In Russ.).

Rybak, S., & Krygina, I. (2019). Actualization of the idea of legal nurturing in the context of a modern transitive society development. *SHS Web of Conferences*, *70*, 11010. https://doi.org/10.1051/shsconf/20197011010

Salistaya, G. S. (2025). Premature socialization of Russian teenagers in the context of digitalization of society. *Sociology*, *6*, 219–224. (In Russ.).

Seidov, G. Z. (2025). Characteristics of information harmful to minors on the Internet. *Agrarnoe i Zemelnoe Pravo*, *4*, 109–111. (In Russ.). https://doi.org/10.47643/1815-1329_2025_4_109

Soldatova, G. U. (2018). Digital Socialization in the Cultural-Historical Paradigm: A Changing Child in a Changing World. *Social Psychology and Society*, *9*(3), 71–80. (In Russ.). https://doi.org/10.17759/sps.2018090308

Soldatova, G. U., Rasskazova, E. I., & Nestik, T. A. (2017). *Digital generation in Russia: competence and security*. Moscow: Smysl. (In Russ.).

Soldatova, G. U., Zotova, E. Yu., Chekalina, A. I., & Gostimskaya, O. S. (2011). *Caught in a single net: social-psychological research of ideas of children and adults about the Internet*. Moscow: Fond Razvitiya Internet. (In Russ.).

Spitzer, M. (2014). *Anti-brain: digital technologies and the brain*. Moscow: AST

Spranger, E. (2014). *Forms of life: Humanitarian psychology and ethics of a personality*. Moscow: Kanon+. (In Russ.).

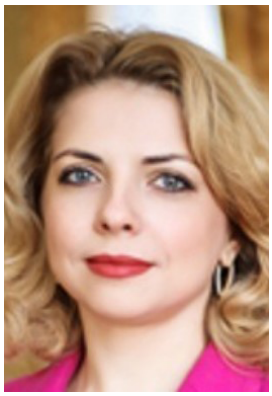
Trubitsyn, A. S. (2017). Cyber dependence is the global form of addiction of modernity. In *Innovations in economy sectors as a factor of solving modern social-economic problems: collection of works and materials of the 7th International scientific-practical conference* (pp. 430–434). Moscow. (In Russ.).

van Krieken, R. (2024). The Age of Anger and Social Media: Elias, Technology, Civilizing/Decivilizing Processes and Ressentiment. *Theory, Culture and Society*, *41*(7–8), 19–39.

Vlasov, A. V. (2023). Information Society Today: Current Trends, Development Prospects and Challenges. *Communicology: Online Scientific Journal*, *4*, 94–110. (In Russ.).

Vygotsky L. S. (2005). *Pedagogical Psychology*. Moscow. (In Russ.).

Authors information



Marina V. Alekseeva – Cand. Sci. (Law), Associate Professor, Head of the Department "Theory and History of State and Law", Don State Technical University
Address: 1 Gagarin square, 344003 Rostov-on-Don, Russia
E-mail: alekseeva80@yandex.ru
ORCID ID: https://orcid.org/0000-0003-1436-6946
Scopus Author ID: https://www.scopus.com/authid/detail.uri?authorId=57221207751
RSCI Author ID: https://elibrary.ru/author_profile.asp?id=769569

Svetlana V. Rybak – Cand. Sci. (Law), Associate Professor, Head of the De-partment "Civil Law", Don State Technical University
Address: 1 Gagarin square, 344003 Rostov-on-Don, Russia
E-mail: svetoch_2504@mail.ru
ORCID ID: https://orcid.org/0000-0002-7280-867X
Scopus Author ID: https://www.scopus.com/authid/detail.uri?authorId=57221193917
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The authors have contributed equally into the concept and methodology elaboration, validation, formal analysis, research, selection of sources, text writing and editing, project guidance and management.

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Правовой аспект кибераддикции среди молодежи: цифровые риски и профилактика

Марина Владимировна Алексеева ✉

Донской государственный технический университет, Ростов-на-Дону, Россия

Светлана Викторовна Рыбак

Донской государственный технический университет, Ростов-на-Дону, Россия

Ключевые слова

девиантное поведение,
кибераддикция,
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право,
правовое воспитание,
профилактика,
цифровая гигиена,
цифровые риски,
цифровые технологии

Аннотация

Цель: обосновать необходимость интегративного подхода к правовому и духовно-нравственному воспитанию молодежи в условиях цифровизации общества и разработать научно обоснованную модель профилактики и коррекции кибераддиктивного поведения на основе синтеза правовых, педагогических и этических компонентов.

Методы: исследование базируется на комплексе теоретических и эмпирических методов, включая диалектический и системный подходы, методы анализа и синтеза, моделирование и прогнозирование. Применены сравнительно-правовой и историко-правовой анализ для изучения эволюции законодательства в сфере цифровой безопасности; проведен междисциплинарный анализ достижений информатики, социологии, психологии и педагогики; использован системно-структурный подход для изучения взаимодействия государственных структур, образовательных учреждений и институтов гражданского общества.

Результаты: выявлена существенная фрагментарность законодательства и отсутствие федеральных программ цифровой гигиены, что препятствует формированию правосознания у молодежи. Предложено авторское определение кибераддиктивного поведения как комплексного личностно-правового отклонения, затрагивающего базовые нормы поведения и свидетельствующего о кризисе ценностной системы. Разработана концептуальная модель формирования «цифрового иммунитета» молодежи, интегрирующая инструменты правового регулирования, образовательные технологии и психологическую поддержку. Определены ключевые направления совершенствования: принятие специальных законодательных инициатив, внедрение программ по развитию цифровой правовой культуры, создание межведомственных механизмов ранней диагностики и коррекции цифровых девиаций.

✉ Контактное лицо

Научная новизна: работа концептуализирует кибераддикцию как многоаспектный правовой и ценностный вызов цифрового поколения; разработана междисциплинарная модель воспитания, учитывающая трансформацию правового сознания в условиях цифровизации; предложены новые дефиниции ключевых понятий и системный подход к профилактике патологических форм цифрового поведения; концептуализирована «цифровая социализация» как специальный предмет правового воспитания.

Практическая значимость: полученные результаты применимы для внедрения в образовательные программы и стандарты; разработки курса «Основы цифровой правовой культуры»; подготовки аккредитованных специалистов по профилактике кибераддикции; создания межведомственных программ цифровой гигиены на государственном, ведомственном и образовательном уровнях. Предложенные меры способствуют формированию у молодежи критического мышления, цифровой грамотности, навыков саморегуляции и устойчивости к манипуляциям в киберпространстве.

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Список литературы

Бажанов, В. (2016). О феномене трансдисциплинарной научной революции. В кн. В. Бажанов, Р. В. Шольц (ред.), *Трансдисциплинарность в философии и науке. Подходы. Проблемы. Перспективы* (с. 136–144). Москва: Навигатор.

Бекиров, С. Н. (2023). Правовая действительность воспитания молодежи в условиях цифровизации. *Проблемы современного педагогического образования*, *78-2*, 36–39. https://www.elibrary.ru/TJZZFN

Бокова, Л. Н. (2023). Правовые вопросы защиты персональных данных граждан в цифровом пространстве. *Вестник МГПУ. Серия: Юридические науки*, *1*(49), 41–48. EDN: https://www.elibrary.ru/WEGJFQ. DOI: https://doi.org/10.25688/2076-9113.2023.49.1.04

Власов, А. В. (2023). Информационное общество сегодня: текущие тренды, перспективы развития и вызовы. *Коммуникология: электронный научный журнал*, *4*, 94–110. https://www.elibrary.ru/tcutgr

Выготский, Л. С. (2005). *Педагогическая психология*. Москва. https://www.elibrary.ru/qxluop

Гаю, Т. Ф. (2019). Снижение уровня коммуникативных навыков: генезис проблемы киберзависимости подрастающего поколения. *Проблемы современного педагогического образования*, *63-4*, 53–56. https://www.elibrary.ru/zojvkh

Гринфилд, С. (2018). *Изменение разума. Один день из жизни мозга. Нейробиология сознания от рассвета до заката*. Санкт-Петербург: Питер.

Дрепа, М. И. (2009). Интернет-зависимость как объект научной рефлексии в современной психологии. *Знание. Понимание. Умение*, *2*, 189–193. https://www.elibrary.ru/ktmotz

Ковров, В. В. (2015). Угрозы и риски агрессии и насилия в межличностном взаимодействии подростков: социально-психологический аспект. *Образование и наука в современных условиях*, *3*, 173–177. https://www.elibrary.ru/ucvnwb

Лазар, М. Г. (2018). Цифровизация общества, ее последствия и контроль над населением. *Проблемы деятельности ученого и научных коллективов*, *4*(34), 170–181. https://www.elibrary.ru/vrwdyc

Попов, П. М. (2024). Образовательная политика в сфере профилактики кибераддикции в молодежной среде. *Гуманитарные науки (г. Ялта)*, *4*(68), 16–22. https://www.elibrary.ru/bengsu

Салистая, Г. С. (2025). Преждевременная социализация российских подростков в условиях цифровизации общества. *Социология*, *6*. 219–224. https://www.elibrary.ru/UELDPJ

Сеидов, Г. З. (2025). Характеристика информации, наносящей вред несовершеннолетнему в сети «Интернет». *Аграрное и земельное право*, *4*, С. 109–111. EDN: https://www.elibrary.ru/NTZPYP. DOI: https://doi.org/10.47643/1815-1329_2025_4_109

Солдатова, Г. У., Зотова, Е. Ю., Чекалина, А. И., Гостимская, О. С. (2011). *Пойманные одной сетью: социально-психологическое исследование представлений детей и взрослых об интернете*. Москва: Фонд развития Интернет.

Солдатова, Г. У., Рассказова, Е. И., Нестик, Т. А. (2017). *Цифровое поколение России: компетентность и безопасность*. Москва: Смысл.

Солдатова, Г. У. (2018). Цифровая социализация в культурно-исторической парадигме: изменяющийся ребенок в изменяющемся мире. *Социальная психология и общество*, *9*(3), 71–80. EDN: https://www.elibrary.ru/YQSMUX. DOI: https://doi.org/10.17759/sps.2018090308

Трубицын, А. С. (2017). Киберзависимость – глобальная форма аддикции современности. В сб. *Инновации в отраслях народного хозяйства, как фактор решения социально-экономических проблем современности: сб. докладов и материалов VII Международной научно-практической конференции* (с. 430–434). Москва. https://www.elibrary.ru/yswiog

Хамидуллин, Р. С. (2023). Политика кибербезопасности современного образования. *Право и политика*, *4*, 48–60. EDN https://www.elibrary.ru/YMIZDD. DOI: https://doi.org/10.7256/2454-0706.2023.4.39997

Шпитцер, М. (2014). *Антимозг: цифровые технологии и мозг*. Москва: АСТ.

Шпрангер, Э. (2014). *Формы жизни: Гуманитарная психология и этика личности*. Москва: Канон+.

Эриксон, Э. (1996). *Идентичность: юность и кризис*. М.: Прогресс, Б. 1996. 340 с.

Alekseeva, M., Podroykina, I., & Isakova, Yu. (2020). Legal basis for the use of educational technologies in the knowledge information space formation. *Innovative Technologies in Science and Education, ITSE*, 2020, 18005.

Kuss, D. J., Kristensen, A. M., & Lopez-Fernandez, O. (2021). Internet Addictions Outside of Europe: A Systematic Literature Review. *Comput. Hum. Behav.*, *115*(1), 106621. EDN: https://www.elibrary.ru/NBRMBY. DOI: https://doi.org/10.1016/j.chb.2020.106621

Lopez-Fernandez, O., & Kuss, D. J. (2020). Preventing Harmful Internet Use-Related Addiction Problems in Europe: A Literature Review and Policy Options. *Int. J. Environ. Res. Public Health*, *17*, 37–97. EDN: https://www.elibrary.ru/ZTOTZX. DOI: https://doi.org/10.3390/ijerph17113797

Mazur, E., & Li, Y. (2016). Identity and Self-Presentation on Social Networking Web Sites: A Comparison of Online Profiles of Chinese and American Emerging Adults. *Psychology of Popular Media Culture*, *5*(2), 101–118.

Mossberger, K., Tolbert, C. J., & Gilbert, M. (2006). Race, place and information technology. *Urban Affairs Review*, *41*(5), 583–620. EDN: https://www.elibrary.ru/JQKYUF. DOI: https://doi.org/10.1177/1078087405283511

van Krieken, R. (2024). The Age of Anger and Social Media: Elias, Technology, Civilizing/Decivilizing Processes and Ressentiment. *Theory, Culture and Society*, *41*(7–8), 19–39.

Rybak, S., & Krygina, I. (2019). Actualization of the idea of legal nurturing in the context of a modern transitive society development. *SHS Web of Conferences*, *70*, 11010. EDN: https://www.elibrary.ru/FRJECQ. DOI: https://doi.org/10.1051/shsconf/20197011010

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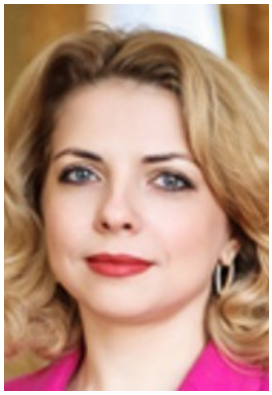

Алексеева Марина Владимировна – кандидат юридических наук, доцент, заведующий кафедрой «Теория и история государства и права», Донской государственный технический университет
Адрес: 344003, Россия, Ростов-на-Дону, пл. Гагарина, 1
E-mail: alekseeva80@yandex.ru
ORCID ID: https://orcid.org/0000-0003-1436-6946
Scopus Author ID: https://www.scopus.com/authid/detail.uri?authorId=57221207751
РИНЦ Author ID: https://elibrary.ru/author_profile.asp?id=769569

Рыбак Светлана Викторовна – кандидат юридических наук, доцент, заведующий кафедрой «Гражданское право», Донской государственный технический университет
Адрес: 344003, Россия, Ростов-на-Дону, пл. Гагарина, 1
E-mail: svetoch_2504@mail.ru
ORCID ID: https://orcid.org/0000-0002-7280-867X
Scopus Author ID: https://www.scopus.com/authid/detail.uri?authorId=57221193917
РИНЦ Author ID: https://elibrary.ru/author_items.asp?authorid=424348

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