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LEGAL REGULATION OF THE USE OF SIMULATION AND MODELING TECHNOLOGIES IN ENSURING STATE SECURITY BY LAW ENFORCEMENT AGENCIES OF UKRAINE

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ABSTRACT

The article is devoted to a comprehensive analysis of the legal foundations for the use of simulation and modeling technologies in the activities of law enforcement agencies of Ukraine in the context of ensuring state security. The need for an in-depth study of this issue has intensified against the backdrop of a global administrative and legal reform, which has placed at the forefront the necessity of developing effective mechanisms for the legal regulation of law enforcement activities, particularly through the introduction of modern digital, simulation, and artificial intelligence technologies.

The study provides an extensive theoretical examination of the subject matter and proposes an original conceptual framework for improving the state security system by establishing clear regulatory norms governing the use of modeling, simulation, and artificial intelligence technologies. Special emphasis is placed on identifying systemic shortcomings and gaps in the current national legislation regulating such technologies, as well as on substantiating the need to update legal mechanisms capable of ensuring integrity, ethical conduct, and the prevention and counteraction of money laundering in Ukraine.

The article reveals the specifics of modern simulation-situational techniques in personnel training, optimization of operational and service activities, and support for managerial decision-making. It provides an expanded overview of regulatory acts that directly or indirectly govern the sphere of simulation modeling, identifying issues of fragmentation, ambiguity, and insufficient coherence among legal norms. Considerable attention is devoted to aspects of cybersecurity, personal data protection, prevention of abuse, and the development of ethical standards and procedural safeguards for the use of intelligent technologies in law enforcement activities.

Based on the conducted analysis, the article formulates scientifically grounded recommendations for the further development of legal regulation in the field of simulation-modeling systems and artificial intelligence, as well as defines directions for integrating these technologies into the national security system, taking into account contemporary challenges and future development prospects.

The Concept of Administrative Law Reform of Ukraine substantiates a coherent set of theoretical and practical ideas, conclusions, provisions, and proposals intended to introduce necessary clarifications and amendments—both to doctrinal aspects and to the normative system of Ukrainian administrative law—regarding the legal regulation of the use of simulation and modeling technologies in ensuring state security by law enforcement agencies.

KEYWORDS

Legal Regulation, Simulation and Modeling Technologies, Law Enforcement Agencies, Legal Doctrine, Administrative Law, Artificial Intelligence

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Introduction

The establishment of a rule-of-law state requires the genuine consolidation of the rule of law, the safeguarding of legality and public order, the protection of human rights and freedoms, as well as the legitimate interests of legal entities. The issue of ensuring the state security of Ukraine remains highly relevant today. In modern conditions, the role of law enforcement agencies in protecting national interests, state sovereignty and territorial integrity, as well as in ensuring economic and information security, is of particular importance and traditionally falls within the scope of administrative law. The use of simulation and modeling technologies that reproduce real conditions of national security formation is a priority direction of public administration and enhances the effectiveness of professional training in this field [1].

A leading position in the sphere of ensuring Ukraine's national security is occupied by simulation and modeling technologies—a set of methods and tools aimed at reproducing conditions as close as possible to real situations. Their purpose is to ensure the protection of vital interests of individuals, society, and the state from external and internal threats by law enforcement agencies.

The training of law enforcement personnel incorporates these technologies through the use of simulations, situational exercises, role-playing models, and specialized instructional-practical scenarios. Their application not only increases the motivation of learners but also facilitates the development of critical thinking, decision-making skills under conditions of uncertainty, as well as communication and teamwork abilities. The creation of training situations that closely resemble real service conditions enhances knowledge acquisition and improves the professional performance of law enforcement agencies [2].

The primary objective of introducing simulation and modeling technologies based on artificial intelligence into the educational process of higher education institutions in Ukraine is to develop the ability to act effectively in real service conditions. This, in turn, contributes to improving the quality of law enforcement tasks and the overall level of security in society and the state.

Scholarly literature identifies various approaches to the use of simulation-modeling and AI-based training methods in the professional preparation of law enforcement personnel. Globalization processes, the interpenetration of legal, economic, political, sociocultural, and informational spheres—enhanced by modern communication technologies—underscore the need for integrated approaches to training. Simulation methods are not limited to specialized simulators or computer-based systems; they may also be implemented through training platforms with competitive elements, scenario-based exercises, situational tasks, and role-playing quests. These approaches allow not only for the assimilation of theoretical knowledge but also for the development of practical competencies, including planning actions, making operational decisions, and effective teamwork—skills that are fundamental in law enforcement practice.

At present, the use of scenario-based modeling is particularly important, as it enables training not only within traditional classroom formats but also through independent preparation of law enforcement personnel.

This contributes to deeper and more conscious learning, as students engage in solving realistic practical tasks that require rapid adaptation and situational analysis. Bringing the educational process closer to real service conditions is particularly important in the training of law enforcement personnel [3].

Currently, Ukrainian administrative law identifies between 17 and 80 law enforcement agencies, depending on the specific interpretation of the term “law enforcement function” and the classification criteria based on it. As a result of the broad interpretation of this concept, nearly all executive bodies that, to some extent, perform law enforcement functions are included among law enforcement agencies—that is, bodies engaged in law enforcement activities within the sphere of legal regulation concerning the use of simulation and modeling technologies [2].

It should be noted that increasing attention has recently been directed toward improving the legal regulation of simulation and modeling technologies in ensuring state security by the law enforcement agencies of Ukraine. Only certain works in this field may be highlighted, including those by: Averianov V. B., Bandurka O. M., Bevzenko V. M., Halunko V. V., Holosnichenko I. P., Dzhuzha O. M., Drozd O. Yu., Kaliuzhnyi R. A., Kolpakov V. K., Komziuk A. T., Kostenko O. V., Lipkan V. A., Muzylichuk O. M., Nikitenko O. I., Predmestnikov O. H., Stetsenko S. H., Tatsii V. Ya.

The relevance of this issue has increased significantly in the context of the ongoing reform of administrative law in Ukraine. In the modern system of legal regulation, the use of simulation and modeling technologies in ensuring state security by law enforcement agencies has its own specific features. Role-playing models of service situations allow learners to perform functions close to real operational tasks—for example, actions during apprehension, conducting interviews, or communicating with citizens and potential offenders—thus fostering the development of professional communication, self-control, stress resilience, and decision-making skills under uncertainty.

Simulation training provides a safe environment for practicing complex service procedures, including responses to crisis situations, operational-search measures, actions during detention or escorting, as well as modeling negotiation and judicial processes, thereby enhancing professional readiness without the risk of real-life consequences. Situational and business games reproduce the structure and functioning of law enforcement agencies. Quest-based and problem-oriented training develops analytical abilities, logical thinking, teamwork skills, and the capacity to make decisions under time constraints.

Overall, the use of simulation-training approaches in preparing law enforcement personnel within the framework of legal regulation of simulation and modeling technologies in ensuring state security by the law enforcement agencies of Ukraine contributes to the formation of internal readiness to act under complex conditions. It reduces psychological tension during the performance of difficult operational tasks and the acquisition of professional skills, while also stimulating initiative and confidence in one's decisions.

Part 1. Simulation and Imitation Methods of Professional Training for Law Enforcement Agencies in Ensuring State Security Against Internal and External Threats

In Ukraine, the implementation of simulation-modeling and training-simulation methods of instruction aligns with ongoing public administration reforms and the constitutional regulation of the status of law enforcement agencies, aimed at ensuring state security, sovereignty, and territorial integrity. This necessitates a clearer definition of the term “law enforcement agencies,” their functional purpose, and their structural organization.

Contemporary administrative-legal doctrine identifies between 17 and 80 law enforcement agencies, depending on the interpretation of the “law enforcement function” and the classification criteria applied. As a result of a broad approach to this concept, the system of law enforcement agencies often includes a wide array of executive bodies that perform certain tasks related to protecting state security from internal and external threats. According to legislation, the law enforcement agencies responsible for national security include: the Prosecutor's Office, the National Police, the Security Service of Ukraine, the Military Law Enforcement Service in the Armed Forces of Ukraine, NABU, the State Border Guard Service, the Bureau of Economic Security, bodies and institutions responsible for the execution of sentences, pre-trial detention facilities, financial control authorities, fisheries protection bodies, state forest protection units, and others that perform enforcement or supervisory functions [4]. Notably, the Law of Ukraine “On State Protection of Employees of the Judiciary and Law Enforcement Agencies” (1993) expands this list by including agencies exercising control and administrative-supervisory functions.

The concept of “law enforcement agencies” in the context of legal regulation of simulation-modeling technologies for ensuring state security in Ukraine is affirmed in Article 17 of the Constitution of Ukraine. Analysis of its third paragraph indicates that the Constitution assigns these agencies the function of ensuring state security and protecting the state. At the same time, their core duties remain the maintenance of public order, the protection of human rights and freedoms, and the prevention of offenses. It should be noted that the constitutional principle of equality of citizens before the law is not explicitly reflected in this context.

In the process of reforming Ukrainian society after the proclamation of independence, the modernization of the legal system plays a particularly important role. The need for such reform became especially relevant after Ukraine's accession to the Council of Europe in November 1995, which entailed assuming a range of international obligations, including in the legal sphere. The primary goal of the reform is to ensure the

implementation of constitutional principles, the effective organization of state authority, the affirmation of the rule of law, and the strengthening of humanistic principles in governmental activity.

An important direction in modern reform is the implementation of innovative approaches in the training of personnel for public administration and the law enforcement system, in particular through the use of simulation and modeling technologies. These technologies contribute to the development of practical skills, enhance the level of professional training, and allow the modeling of real situations in the fields of state security and law enforcement.

Administrative law, as an independent branch, has a long history dating back to the 18th century. Throughout its development, it has remained closely connected with the functioning of public authority and currently plays a leading role in the legal support of the use of simulation and modeling technologies within the activities of state authorities and law enforcement institutions [5].

In view of the above, it is necessary to significantly improve the quality of administrative-legal regulation, the structure, and the activities of law enforcement agencies regarding the legal provision for the use of simulation and modeling technologies in ensuring state security by Ukraine's law enforcement agencies. This logic of training is also actively integrated into the preparation of law enforcement personnel in the field of maintaining public order in the state, based on principles according to which no one can be compelled to act beyond the law, and officials are obliged to act solely on the basis, within the limits of authority, and in the manner prescribed by the Constitution and laws of Ukraine [6].

In this context, simulation-modeling methods acquire particular significance, as they allow the reproduction of professionally relevant situations: conducting investigative actions, ensuring public safety, responding to unlawful acts, and communicating with citizens or suspects. This creates conditions for developing practical readiness to act responsibly, clearly, and rationally in situations as close as possible to real-life conditions.

Modern educational programs that integrate simulation and scenario-based training for the development of practical professional skills deserve special attention. In several Ukrainian universities, courses have been introduced that involve modeling real-life situations and organizational activities, allowing students to safely practice decision-making processes, resource allocation, and teamwork. These formats have proven effective in developing the competencies necessary for operating in a dynamic professional environment.

Despite positive trends, the implementation of simulation and modeling technologies in Ukraine faces a number of challenges. Among the main obstacles is the insufficient material and technical base of many educational institutions, including the lack of modern training platforms, VR complexes, and specialized software. An additional barrier is the limited number of instructors skilled in organizing simulation-based training and creating interactive educational environments.

These difficulties are particularly pronounced in the training of future law enforcement personnel, for whom modeling real service situations is of critical importance. A shortage of competent instructors and modern training grounds slows the improvement of professional preparation, which may negatively affect the quality of task performance in future operational activities.

Consequently, there is a need to develop specialized training programs for the faculty of higher education institutions, enabling them to effectively implement simulation-training approaches to the legal regulation of simulation and modeling technologies based on artificial intelligence in law enforcement activities, as well as to support these processes at the state level. Systematic modernization of infrastructure, enhancement of faculty qualifications, and the development of partnerships between Ukrainian higher education institutions and the European Union could significantly accelerate the adoption of modern simulation and modeling technologies in Ukraine's educational process and legal system reforms.

Part 2. Modeling Professional Situations as a Tool for Competency Development in Law Enforcement Education

The rights and freedoms of individuals and citizens proclaimed in the Constitution of Ukraine—such as the right to life, dignity, inviolability, property, information, equality before the law, participation in public affairs, and the freedom of peaceful assembly—cannot be effectively realized without proper administrative-legal definition of citizens' status in their relations with law enforcement agencies and executive authorities in the sphere of state security. The effective protection of constitutional guarantees and adherence to the rule of law depend on the clarity of legal regulation governing the activities of these agencies.

In this context, the use of simulation and modeling technologies in the practical activities of law enforcement agencies to ensure state security becomes particularly significant. Such technologies enable the

reproduction of real-life situations faced by law enforcement bodies in the course of safeguarding Ukraine's state security—from responding to emergencies to maintaining public order or investigating offenses. The simulation-modeling approach creates conditions for developing action algorithms in crisis situations, practicing communication models, and acquiring skills for making operational decisions within legal frameworks.

Research indicates that these methods create a natural professional environment in which law enforcement personnel not only acquire new knowledge but also refine behavioral strategies and learn to act coherently and responsibly. Emotional engagement, practical orientation, and the opportunity to make independent decisions ensure deeper knowledge assimilation, the development of analytical thinking, self-control, and stress resilience.

The use of simulation and modeling technologies also contributes to the improvement of organizational culture in law enforcement agencies, the formation of professional ethics, and the ability to operate under uncertainty and risk. The flexibility of these technologies allows them to be adapted to the specifics of various areas of law enforcement activity—operational, investigative, anti-corruption, border, security, and others. As a result, simulation-modeling methods become not only a tool for professional training but also an effective means of enhancing the overall efficiency of Ukraine's law enforcement system.

Updating the content of the administrative-legal status in the sphere of legal regulation of the use of simulation and modeling technologies for ensuring state security by Ukraine's law enforcement agencies should be carried out through the improvement of Ukrainian legislation. This concerns not only the enshrinement of the natural and universally recognized rights and freedoms of citizens but also the creation of an effective mechanism for guaranteeing national security against internal and external threats, protecting sovereignty and territorial integrity, upholding the principles of the rule of law and legality, as well as ensuring Ukraine's economic and informational stability [7].

At the same time, the practical use of simulation and modeling technologies is accompanied by certain challenges in the field of ensuring Ukraine's state security. These include substantial expenditures of time, resources, and human capital required to develop realistic scenarios, prepare the material and technical base, and provide methodological support. Difficulties also arise in assessing the effectiveness of outcomes, as traditional approaches to evaluating professional actions do not always correspond to active and interactive forms of work. There is also a risk of formalizing the modeling process, where technologies are applied superficially or without consideration of actual service needs, reducing their practical value. As noted by Anderson and Dill, incorrect or excessive use of certain types of simulations may cause emotional overload or undesirable behavioral responses, emphasizing the need for professional oversight, scientific support, and strict alignment between objectives and methods.

Conclusions

The topic of this study is broad in scope, focusing on the legal regulation of the use of simulation and modeling technologies in ensuring state security by Ukraine's law enforcement agencies against unlawful encroachments, protecting sovereignty and territorial integrity, ensuring economic and informational security, and safeguarding human rights, freedoms, and their guarantees.

The chosen scope of the study is deliberate: the legal regulation of the use of simulation and modeling technologies in ensuring state security by law enforcement agencies of Ukraine, in accordance with the Law of Ukraine "On State Protection of Employees of the Judiciary and Law Enforcement Agencies," the Legal Doctrine of Ukraine, and the Concept of Administrative Law Reform in Ukraine. Unlike traditional approaches, the application of such technologies creates conditions for modeling professional situations, making decisions under time constraints and informational uncertainty, and fostering accountability for the consequences of one's actions.

The use of international law in the legal regulation of simulation and modeling technologies for ensuring state security by Ukraine's law enforcement agencies reflects a long-standing history of safeguarding national security against internal and external threats. Reform processes in the sphere of law enforcement activities in Ukraine and the constitutional codification of the status of law enforcement agencies primarily require clarification of the use of "simulation and modeling technologies" in the field of state security. The rule of law and the maintenance of legality form the foundation of law enforcement activities in protecting the internal security of the state against internal and external threats [8].

At the same time, the effectiveness of these methods depends on the level of methodological support, material and technical resources, staff qualifications, and the ability to adapt approaches to the organization of

state security provision by law enforcement agencies. The absence of clear criteria for evaluating results, the risk of formal implementation, and resistance from traditional methods pose certain challenges. However, these difficulties can be overcome with systematic state support and the development of professional training programs for law enforcement agencies.

Therefore, the implementation of simulation and modeling technologies should be carried out as a conceptually grounded, integrated element of law enforcement activity. This approach allows the combination of theoretical knowledge with practical skills, develops professionally significant qualities, and creates conditions for training competent specialists capable of effectively acting under contemporary threats and challenges, ensuring the protection of citizens' rights, freedoms, and security.

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