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INTEGRATION OF MODERN TECHNOLOGIES INTO THE COMBAT OPERATIONS PLANNING PROCESS

The article presents an analysis of the prospects for integrating modern technologies into the process of combat operations planning and their impact on the effectiveness of military command and control. The concept of key innovations is examined, including automated command and control systems (ACCS), artificial intelligence (AI), big data, unmanned aerial vehicles (UAVs), satellite systems, and electronic warfare (EW) tools. The role of these technologies in enhancing situational awareness, decision-making responsiveness, and coordination of unit actions in real time is defined. Particular attention is given to issues of cybersecurity, the protection of information systems, and the prospects for employing cloud technologies in military management. Potential threats and challenges associated with the digitalization of combat operations management processes are analyzed.

In the course of research and analysis, members of the scientific research group employed the following methods (at the theoretical level): analysis of scientific literature and documentation, systems analysis, comparative analysis, conceptual analysis, inductive and deductive methods, and methodological analysis. In addition, the study drew upon the experience of combat operations, as well as personal experience in the training of future officer personnel for the needs of the National Guard of Ukraine (other institutions within Ukraine's security and defense sector).

Based on the results of the study, it is concluded that the integration of modern technologies into military planning is a key factor in enhancing the combat readiness of the armed forces and the effectiveness of combat operations. Promising directions for further research are identified, including the development of artificial intelligence, the improvement of data protection, and the refinement of algorithms for combat situation analysis.

Keywords: *automated systems; analytics; combat operations; military command and control; service members; operational art; modeling; decision-making; simulators; technologies.*

Statement of the problem. The relevance of the study is driven by the dynamic development of the military-strategic environment, the necessity to improve the timeliness and efficiency of decision-making, and the growing role of technology in ensuring battlefield superiority. The conduct of modern combat operations requires the use of advanced digital solutions, artificial intelligence, large volumes of data, automated command and control systems, and situational analysis tools. The integration of these technologies allows for the optimization of planning processes, improvement of forecasting accuracy, risk minimization, and enhanced coordination among units.

It is important to emphasize that the process of combat planning based on the military decision-making model used by NATO countries is a complex yet highly effective mechanism. It provides commanders with essential tools to make rational and well-grounded decisions while performing assigned tasks under extreme conditions of operational activity. Given the current challenges in the field of security and defense, research in this area contributes to enhancing the efficiency of military command and control, adapting the Security and Defense Forces of Ukraine to the latest conditions of warfare, and strengthening national defense capabilities.

The research was conducted within the framework of the initiative scientific project *"Technologies for Combat Operations",* involving the Department of Tactics of the Faculty of Operational and Combat Activities of the National Guard of Ukraine and the Department of Physical Education, Special Physical Training, and Sports of the Kyiv Institute of the National Guard of Ukraine.

Analysis of recent scientific research and publications. At the initial stage, a comprehensive analysis of scientific publications by leading researchers was conducted: S. Chupakhin [1], Yu. Repila, O. Holovchenko [2], O. Khatsaiuk, M. Medvid, B. Maksymchuk, O. Kurok, R. Kizian, O. Khatsaiuk, O. Biriukov [4], who addressed the pressing issues of preparing representatives of Ukraine's security and defense institutions for the execution of their duties. The scientific concepts presented by these scholars highlight the importance of defining contemporary vectors in the professional training of representatives of the security and defense sector, which contributes to enhancing the effectiveness of task execution and strengthening national security.

Further review of specialized scientific-methodological and reference literature emphasized the significance of the works of O. Nazarenko, H. Drobakha [5], A. Lunkov, V. Kovch, S. Pokhnatiuk [6], S. Melnyk [7], V. Varakuta, O. Kumpan, M. Tkachenko, and S. Podviaznikov [8]. These studies provide examples of increased efficiency in military command and control within the operational activities of servicemen in Ukraine's security and defense sector. It is essential to underline that enhancing the effectiveness of military command and control during the operational activities of security and defense personnel is a critical factor in ensuring rapid decision-making, coordinated action, and successful task execution. This, in turn, contributes to strengthening the nation's defense capabilities, raising the level of professional training of personnel, and optimizing resource use under modern security challenges.

Equally informative and conducted at a high scientific-methodological level are the studies of O. Morgunov, O. Yareshchenko, O. Khatsaiuk [9], V. Voloshyn [10], O. Markov, Yu. Samsonov, S. Borodin, V. Shemchuk, I. Atamanenko [11], I. Romanov, V. Kochkin, and O. Demchenko [12]. These works identify relevant methodologies (technologies) that ensure the readiness of security and defense sector personnel of Ukraine to employ modern technologies in the execution of assigned tasks under extreme conditions. It is worth emphasizing that such technologies play a vital role in shaping the readiness of security and defense personnel for effective military-professional activity in high-risk environments. They facilitate the enhancement of professional training, adaptation to the dynamic changes in the security domain, effective use of high-tech equipment, and coordinated action in

critical situations. This, in turn, supports national defense strengthening and the safeguarding of national security.

Summarizing the results of the analysis of scientific, methodological, and reference literature, it should be noted that studies comprehensively revealing the features of integrating modern technologies into the process of combat operations planning are relatively rare. This highlights the necessity for further research, affirms the timeliness and relevance of the topic, and underscores the practical significance of the selected direction of theoretical investigation.

Purpose of the article is to conduct a comprehensive analysis of modern technologies used for the planning and real-time adjustment of combat operations, with the aim of determining their impact on enhancing the effectiveness of military command and control.

To achieve this goal, the following research objectives were set:

- to analyze scientific, methodological, and specialized literature on the training of personnel from Ukraine's security and defense institutions for the fulfillment of operational tasks;
- to monitor scientific-methodological and reference sources focused on improving the effectiveness of military command and control in the course of operational and combat activities;
- to identify relevant methods (technologies) that ensure the preparedness of military personnel from Ukraine's security and defense institutions to apply modern technologies while carrying out tasks under extreme conditions.

In the course of research and analytical work, the members of the research group employed the following methods:

1) analysis of scientific literature and documentation a systematic review of publications, reports, normative acts, and methodological materials concerning the application of modern technologies in the planning and operational (adjustment of combat operations).

2) systems analysis (examination of the problem as an integrated system, analysis of interconnections between components of military command and the impact of technologies on their effectiveness).

3) comparative analysis (identification of common and divergent characteristics of modern technologies used in planning and operational correction, in order to determine optimal solutions).

4) conceptual analysis (development of conceptual models illustrating the mechanisms through which technologies enhance the effectiveness of military command and control).

5) inductive and deductive methods (drawing general conclusions from the analysis of specific cases (induction), and verifying formulated hypotheses in the logical sequence of the research (deduction)).

6) methodological analysis (evaluation of methodologies used in modern technologies for planning and operational adjustment of combat operations, aimed at identifying their strengths and weaknesses).

In addition, the study incorporated both combat experience and the personal experience of preparing future officer personnel for the needs of the National Guard of Ukraine (other institutions of the security and defense sector of Ukraine).

Presentation of the Main Material. During the subsequent stage of the research and analytical activities, based on the analysis of scholarly works by S. Poliakov, A. Kurtov, V. Polikashin [13], V. Vlasiuk, S. Karpenko, V. Hridin [14], M. Adamchuk, A. Semeniuk, and S. Pavlenko [15], it was determined that the development of an effective system of military command and control is a critical task under modern conditions. New-generation warfare is characterized by the use of high-tech weaponry, information technologies, accelerated decision-making processes, and the need for coordination between various military branches and allied forces.

The significance of military command and control systems in the current context lies in: the speed and responsiveness of decision-making, coordination and interoperability, integration of technologies and digital platforms, cybersecurity and information warfare, flexibility and adaptability, logistics and comprehensive support for the troops.

The development of a modern military command and control system is key to increasing the army's combat effectiveness, reducing losses, and achieving strategic objectives. Ukraine, currently engaged in war against the russian federation, has already begun to implement such systems, enabling it to successfully counter the enemy and effectively manage military operations.

The analysis of scientific studies by scholars such as I. Pavlovskyi [16], O. Vorobiov, P. Smolych, and I. Vlasov [17] has led to the conclusion that combat operations constitute complex military actions aimed at achieving strategic, operational, or tactical objectives

within a war or armed conflict. These operations encompass the use of various branches of the armed forces and means of combat, coordination of actions, and the implementation of modern technologies. The main characteristics of combat operations are as follows:

1) goal orientation (each combat operation pursues a clearly defined objective, such as the seizure of territory, destruction of enemy forces, or halting an offensive).

2) complexity and coordination (operations involve the engagement of various branches of the armed forces (land, air, naval, cyber units, artillery, missile forces, etc.), with the synchronization of actions between units being critical to maximizing operational effectiveness).

3) phased execution (planning: situational analysis, task formulation, resource allocation; preparation**:** reconnaissance, supply organization, reserve formation; execution**:** direct engagement in combat actions; post-operation analysis**:** assessment of success and adjustment of future plans).

4) flexibility and adaptability (modern combat operations require rapid responses to dynamic battlefield conditions, including the adaptation of tactics, logistics, and command structures).

5) technological dimension (the use of unmanned aerial vehicles (UAVs), electronic warfare systems (EWS), satellite-based intelligence, and cyber capabilities plays a significant role).

6) information and psychological component (in addition to physically neutralizing the enemy, information warfare, enemy demoralization, and the maintenance of morale among one's own troops are crucial).

Types of combat operations include offensive, defensive, counteroffensive, guerrilla, and special operations, as well as cyber operations aimed at disrupting enemy command, communication, and logistics networks.

Therefore, modern combat operations are complex, multi-level processes requiring thorough planning, technological integration, and high-level coordination. Their success depends on the professionalism of command structures, the mobility of troops, the quality of intelligence, and the efficient use of available resources.

Of particular interest are the scientific works of researchers such as Yu. Samsonov, O. Markov, O. Zabulia, and O. Khatsaiuk (et al.) [18]; Yu. Samsonov, Yu. Belashov, O. Khatsaiuk, K. Zadorozhnyi, V. Tolokhieiev (et al.) [19]; and O. Markov, Yu. Samsonov, S. Borodin, V. Shemchuk, I. Atamanenko [11]. These studies explore the specifics of deploying modern military command technologies within Ukraine's Defense and Security Forces. Modern military command technologies allow armed forces to respond rapidly to changing conditions, effectively coordinate actions, and maintain operational superiority over the adversary. The wars of the future will be defined by the level of technological preparedness of the forces involved.

In our view, effective solutions to the outlined challenges include the active implementation of: automated command and control systems (ACCS), geographic information systems (GIS), artificial intelligence (AI), simulators and modeling systems, surveillance and reconnaissance systems, analytical tools and big data, secure communication systems, virtual and augmented reality (VR/AR), cybersecurity solutions and electronic warfare assets, robotic platforms.

Various countries are actively deploying automated command systems, including: Joint Operational Command System (JOCS) – United Kingdom, TALOS – Israel, Advanced Field Artillery Tactical Data System (AFATDS) – USA, FBCB2 (Force XXI Battle Command Brigade and Below) – USA, Command Post Computing Environment (CPCE) – USA, SitaWare Headquarters – Denmark, Blue Force Tracker – USA, NATO Mission Planning Systems. Russian forces use the BARS system. Ukraine's Security and Defense Forces are actively utilizing systems such as Delta and Kropyva (with ongoing testing of Slavutych, Bazalt, and various UAV systems).

It is important to emphasize that automated command and control systems (ACCS) share common objectives, namely:

1) enhancing the effectiveness of unit command and control under combat conditions;

2) collecting, processing, and analyzing data from diverse sources (intelligence, unmanned aerial vehicles, satellites, geographic information systems, logistics data) in order to generate a comprehensive operational picture of the battlefield;

3) rapid acquisition and processing of information, enabling commanders at all levels to make informed decisions in real time;

4) ensuring interoperability across different levels (tactical, operational, strategic) among various units comprising Ukraine's Defense and Security Forces;

5) providing situational awareness and accurate threat analysis, which helps prevent errors that could lead to casualties among military personnel and the civilian population;

6) utilizing intuitive interfaces and automating routine tasks, thereby reducing the workload on commanders and their staff.

Of particular interest is the fact that geographic information systems (GIS) play a critical role in the military decision-making process. They facilitate the efficient collection, analysis, visualization, and integration of geospatial data, thus contributing to the optimization of military planning, resource management, and tactical operations. This is achieved through the use of advanced mapping technologies and terrain analysis (see Table 1).

In an environment characterized by the active use of artificial intelligence technologies, the military decision-making process advances to an entirely new level. This is a tool that significantly increases the speed, accuracy, and effectiveness of decision-making while simultaneously reducing risks and losses. Artificial Intelligence (AI) provides substantial advantages (see Table 2) in the military decision-making process due to its capacity to analyze large volumes of data, automate processes, and forecast probable scenarios.

During the collection and processing of intelligence data, it is advisable to employ the ISTAR system (Intelligence, Surveillance, Target Acquisition, and Reconnaissance). This system can significantly enhance the effectiveness of military and security operations (see Table 3) by providing advanced capabilities for information collection, analysis, and utilization.

Table 1

Geographic information systems used in NATO member states

Name of the system	General characteristic
ArcGIS (Esri)	Widely used by NATO military forces for the analysis of the combat situation, operational planning, and logistics, it enables 3D terrain visualization, route analysis, and the integration of data from drones, satellites, and radar systems.
SAGA GIS	Analyzes geospatial data for terrain modeling and assessment of natural obstacles, enables detailed terrain analysis, and allows for the construction of a hydrographic model (e.g., calculation of flood probability in specific areas).
QGIS	Used for mapping, analysis of the combat situation, and operational planning; enables integration with data from open sources (e.g., satellite imagery).
ATLAS	Actively used by the Israel Defense Forces, provides the capability for high-precision terrain analysis.
DELTA	Actively used by the units of the Defense Forces of Ukraine, provides the capability to integrate geospatial data from intelligence sources (drones, satellites, radars).

Table 2

Main advantages of artificial intelligence

Components	General characteristic
Analysis speed	AI can instantly process large volumes of data from various sources (satellites, drones, radars); AI algorithms analyze the combat situation in real time, providing commanders with up-to-date information.
Accuracy	AI eliminates the risk of errors related to human factors (fatigue, stress); by analyzing historical data and current events, AI can predict probable outcomes of combat decisions.
Data integration	AI integrates data from diverse sources (intelligence, meteorology, logistics), forming a unified operational picture.
Management of complex systems	Algorithms are used to coordinate between different types of military equipment (drones, air defense systems, tanks).
Situational awareness	AI is capable of detecting threats (e.g., identification of enemy equipment) through the use of computer vision.
Real-time monitoring	Continuous analysis of changing conditions enables better situational awareness in a dynamic environment.
Decision support	AI can propose optimal courses of action based on the analysis of various scenarios.
Scenario modeling	The generation of possible scenarios enables the assessment of the consequences of different strategies.
Resource efficiency	AI assists in the efficient allocation of resources (ammunition, equipment, supplies) within the combat zone.
Adaptability	Thanks to machine learning algorithms, AI enhances its functions by analyzing previous combat operations. It demonstrates flexibility under diverse conditions and can rapidly adapt to changes in the combat environment.
Working in risky conditions	AI allows for the control of equipment without risking the lives of military personnel (for example, drones or robotic platforms).
Loss minimization	The use of autonomous systems reduces the risk to personnel in extreme conditions of service and combat operations.

Table 3

Advantages of the ISTAR system

Components	General characteristic
Increased situational awareness	ISTAR enables operators and commanders to access real-time information about the enemy, objects, or the situation, allowing for rapid and well-founded decision-making
Improving the accuracy and effectiveness of the attack	By collecting data on potential targets, ISTAR assists in locating and identifying targets more accurately, ensuring more effective use of weapons and resources
Minimizing risks for operators	Through remote or autonomous surveillance systems, ISTAR facilitates reconnaissance and provides information on potential threats without exposing operators to danger
Increased coordination and cooperation	The integration of various information sources into the ISTAR system promotes enhanced coordination and cooperation among institutions within Ukraine's security and defense sector (Security and Defense Forces of Ukraine)

Overall, ISTAR can play a dominant role in enhancing the efficiency of operations by providing access to critical information, reducing risks, and improving decision-making processes. Furthermore, ISTAR assists operators and commanders in obtaining real-time access to essential information regarding:

1) surveillance systems (ISTAR encompasses a variety of sensors, such as radars, cameras, thermal imagers, etc., which provide continuous monitoring of the operational environment);

2) data collection and analysis (ISTAR is capable of gathering and processing substantial volumes of data from various sources, including images, video, radio signals, and other types of information);

3) real-time information delivery (thanks to advanced communication technologies, information collected by the ISTAR system can be instantly transmitted to operators and commanders, enabling rapid responses to situational changes);

4) data visualization and representation (the information obtained through ISTAR can be visualized in the form of maps, charts, images, or other formats, facilitating a clearer understanding of the situation by operators).

In general, by increasing situational awareness through ISTAR capabilities, operators, commanders, and their staffs are able to make timely and informed decisions based on current and reliable intelligence about the enemy, key objects, or the operational environment. Additionally, ISTAR tools enable reconnaissance and the collection of intelligence on potential targets, including their location, structure, and characteristics. Due to a variety of sensors and analytical instruments, ISTAR systems can detect and identify targets even under complex conditions, thereby increasing the accuracy of enemy engagement. The intelligence provided by the ISTAR system facilitates precise targeting, ensuring accurate and effective strikes.

Thus, by collecting data on potential targets and accurately determining their location through the ISTAR system, units can plan the use of weapons and means more efficiently and accurately to achieve set objectives. Another significant advantage of ISTAR systems is the minimization of risks to personnel. ISTAR enables reconnaissance and the delivery of intelligence on potential threats without exposing personnel to direct danger. The following section explores how ISTAR helps reduce risks to service members.

It is also noteworthy that ISTAR systems may include remote or autonomous surveillance platforms, such as unmanned aerial vehicles (UAVs) or drones, which allow reconnaissance to be conducted at a safe distance from potentially hazardous objects. Through these remote surveillance systems, military personnel can obtain essential information about the environment and potential threats while remaining outside the danger zone. The use of remote or autonomous systems significantly reduces personnel exposure to risk and hazards during reconnaissance and threat detection. Information received from the ISTAR system can alert personnel to potentially dangerous situations, enabling them to avoid risks and make well-informed decisions.

Hence, through the use of remote and autonomous surveillance systems within the ISTAR framework, reconnaissance units are able to conduct reconnaissance and obtain intelligence on potential threats without endangering themselves. In turn, the integration of diverse data sources (see Table 4) into the ISTAR system contributes to enhanced coordination among units involved in the execution of operations.

Table 4

Main functions of the ISTAR system

Sources of information and nature of actions	General characteristic
Combining information:	ISTAR is capable of integrating information from various sources such as reconnaissance drones, radar systems, satellite assets, and others, enabling the creation of a comprehensive situational picture.
Sharing of information:	All military units operating in the area of combat operations with access to the ISTAR system can receive up-to-date information and jointly analyze it for coordinated decision-making.
Coordination of actions:	Thanks to shared information access, units can better coordinate their actions and collaborate to achieve assigned objectives.
Rapid response:	The joint analysis of information within the ISTAR system allows operators to quickly respond to changes in the situation and make effective decisions.

Thus, the integration of various information sources into the ISTAR system contributes to enhanced coordination and cooperation among all military units, helping to ensure more efficient and coordinated operations in different situations.

As an example, the process of military decision-making using the planning model applied by NATO member states (with the use of modern technologies) may appear as follows:

first stage (upon receiving the task, the input data are the task received from the higher-level military command authority, or a task defined by the command or staff in the form of an operations order, preliminary combat order, or operation execution plan; the output is that the commander must conduct a preliminary time estimate and issue preliminary orders. Communication between the higher military command and subordinate personnel is maintained through secure radio communication channels. To ensure stable and secure communication, units actively implement modern secure communication means, such as Motorola digital radios of the DM4600/DM4601 and DP4400/4800/4401/4801 series, which provide encryption and a high level of information protection. In addition, satellite communication systems such as Tooway are used, enabling the establishment of effective, secure, and interactive high-quality Ethernet communication lines with remote locations. Military telecommunications networks: the Armed Forces of Ukraine have deployed open telephone networks, which allow calls to mobile operator numbers. This provides anonymity, as in the event of call interception, the enemy cannot identify who is calling or from where. Recommendations regarding the use of mobile phones: Service members are advised to minimize the use of mobile phones in combat zones, as even encrypted digital communication may reveal location. It is recommended to use secure messengers, such as Signal, and avoid calls and SMS; it is advisable to use the information and communication system of the official information exchange network – MOSI);

second stage (during task (mission) analysis, unit commanders, having input information on preliminary instructions from the commander, orders (plans) from the higher-level command, intelligence data from the higher military command, refined staff calculations, must develop the output data, based on which the military planning process will be conducted. Modern technologies significantly simplify the process, saving considerable time. The time estimate is refined, updated staff calculations are taken into account, a preliminary reconnaissance plan (schemes, overlays) is developed, the commander's requirements for critical information delivery are clarified, assumptions are made, problem areas are identified along with solutions, criteria for evaluating courses of action are established based on the main objective, the main task is formulated, the commander's preliminary intent is developed, and a task analysis briefing (tactical meeting) is held with key planning guidance from the commander. For the time

estimate, the commander must remember how much time can be allocated to each stage of the military decision-making process from receiving the task to execution (in NATO member states' units, this estimate is conducted according to the rule – one-third for own planning and two-thirds for subordinate planning; this estimate provides percentage-based time allocations for each stage: receiving the task (mission) – 5%; task (mission) analysis – 30%; development of courses of action – 20%; analysis, comparison, decision-making on courses of action – 25%; preparation, issuance, and dissemination of orders – 20%). Knowing the input data, using basic arithmetic formulas and computer software, the commander can perform the time estimate in minutes with simple programs such as TimeandDate.com, Excel / Google, MATLAB, Time Percentage Calculator. Throughout the entire combat planning period, the staff, in accordance with their responsibilities (sections S1, S2, S3, S4, S5, S6), develop their respective plans, actively utilizing systems such as Delta, Kropyva, and Vezha);

third stage (analysis of courses of action takes place, which involves the conduct and simulation of a so-called military game. The commander, having updated calculations, refined instructions, developed courses of action, and revised assumptions, determines the updated courses of action and potential decision points. Taking into account the results of the military game, a briefing (meeting) is held. During the military game, computer simulation programs may be used, such as JCATS, VBS4, SimCentric Mission-Ready Software. The Armed Forces of Ukraine are introducing new software products in information and communication technologies with promising potential, for example, the combat operations simulation tool (COSST) Steel Beasts, a tactical combat simulator that allows the enactment of various scenarios from individual crew level or company to brigade level. A distinctive feature of Steel Beasts Pro is its focus on realism);

fourth stage (during the comparison of courses of action using ordinary calculations and considering defined criteria, the commander selects the optimal course of action, provides guidance on eliminating shortcomings, updates assumptions, and conducts revised calculations);

fifth stage (the commander receives from the staff updated calculations, objective recommendations on the course of action, revised assumptions, and approves the selected course of action, refines requirements for key information delivery, updates assumptions, and provides final planning guidance);

sixth stage (the commander approves the operation plan or combat order and verifies how subordinates have understood the plan or combat order).

A comprehensive analysis of modern technologies used for planning and operational adjustment of combat operations was conducted during the study. It was established that the implementation of automated troop command and control systems (ATCCS), artificial intelligence, big data, electronic warfare tools, satellite and unmanned technologies significantly enhances the effectiveness of military command.

The use of these technologies ensures the promptness of decision-making, accuracy of situational awareness, coordination of unit actions, and adaptability to changes in the combat environment. An important aspect is also the protection of communication and information systems, which minimizes the risk of command disorganization.

Thus, the implementation and improvement of modern military technologies is a key factor in increasing the combat readiness and effectiveness of the Armed Forces of Ukraine under current conditions. Therefore, the tasks set before us have been fulfilled, and the main objective of the study has been achieved.

Conclusions and prospects for further research. As a result of the conducted study, a comprehensive analysis of modern technologies used for the planning and operational adjustment of combat operations was carried out.

The members of the research group identified key innovations, in particular automated command and control systems (ATCCS), artificial intelligence technologies, big data, unmanned aerial vehicles, satellite systems, electronic warfare means, and cyber operations.

It has been proven that the integration of these technologies into military command significantly increases the effectiveness of combat operations by ensuring the accuracy of situational awareness, speed of decision-making, coherence of unit actions, and flexibility in changing conditions of warfare. In addition, special attention is paid to the issues of cybersecurity and the protection of communication channels, which are critically important for maintaining the resilience of the command and control system.

Thus, the development and implementation of modern technologies for managing combat operations is

a strategic factor in increasing the combat capability of the armed forces, allowing for battlefield superiority and effective adaptation to the challenges of modern warfare. The results of the study have been implemented in the tactical training system for cadets of the Kyiv Institute of the National Guard of Ukraine.

Based on the conducted analysis, the members of the research group identified key directions for further research regarding the application of modern technologies for the effective and rational planning (operational adjustment) of combat operations, namely: integration of artificial intelligence into military command; development of electronic warfare and cybersecurity systems; optimization of the use of unmanned systems in combat operations; implementation of cloud technologies and blockchain in military command; development of real-time situational awareness systems; automation of logistics processes and supply under combat conditions.

Further research in these areas will contribute to improving the effectiveness of military command, strengthening defense capabilities, and creating adaptive strategies for conducting combat operations in modern conditions.

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