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ANALYSIS OF DECISION-MAKING SUPPORT SYSTEMS IN THE PERFORMANCE OF SERVICE AND COMBAT TASKS BY THE SECURITY FORCES OF UKRAINE

The author analyzes an existing decision-making support systems for the security forces of Ukraine. It is determined that military decision-making requires a multifactorial approach and a deep understanding of one's capabilities, strategic goals and tactical circumstances. Each stage of military operations requires careful analysis and development of effective strategies to achieve the set goals.

Support systems have a wide range of tools, techniques and technologies aimed at ensuring effective management of the country's security. Improving and developing decision support systems in this area is an ongoing process that requires a combination of strategic vision, technical knowledge and flexibility in response to new challenges and threats.

Keywords: *state security, conceptual foundations of public administration, security forces, information and analytical support, management bodies, decision support systems.*

Statement of the problem. A modern strategy for achieving information superiority over the enemy, based on the introduction of the latest information technologies (IT) into management systems, has become a key factor that determines the effectiveness of state and military leadership. From now on, the reliable functioning of information systems becomes critical to ensure the stability of these bodies. Information superiority is an integral tool that allows the command to make the most effective use of dispersed groups of heterogeneous forces in the decisive operations, to increase the level of protection of military units, to put into operation the groupings, the composition of which most closely corresponds to the assigned tasks, as well as to carry out flexible and targeted logistical support.

Achieving information superiority and maintaining it requires the implementation of measures aimed at undermining control systems, decision-making processes, as well as destroying computer and information networks and systems of the enemy. Thus, the latest IT is turning into a fundamental element of modern armed confrontation. With their introduction, the range of possible scenarios for the resolution and conduct of armed conflicts is expanding, in particular with the use of detailed planning and forecasting of their consequences in all spheres – political, economic, military and others.

The use of IT creates opportunities for the development of new systems and forms of armed struggle with fundamentally new properties. In other words, IT makes it possible not only to collect, analyze, process and interpret data more qualitatively, but also, due to its system-forming role, opens up new prospects for the development and improvement of both theoretical and experimental methods of scientific research in the field of automation of military control, the creation of promising samples of weapons and military equipment and the improvement of existing ones [1].

If during decision-making the uncertainty of the situation is considered as a lack or insufficiency of the necessary information, then using the theory of information, it is possible to determine the level of this uncertainty through the function of belonging to fuzzy sets. This makes it possible to calculate the information entropy and establish the desired threshold of reliability, which is considered sufficient for making a decision. This approach contributes to increasing the effectiveness of decisions during combat operations [1–4].

In addition to the technologies of preparation and decision-making, the structure of the information and analytical system, its integration, as well as the quality of ensuring the management processes of the security forces have a significant impact on the quality of management of the military forces in modern conditions.

An important role is played by the content and completeness of the analyzed data. Since the basis of management processes are decisions made by management bodies, the information and analytical system must first of all ensure effective preparation and adoption of these decisions. The quality of the decisions made will determine not only the effectiveness of the management system itself, but also the results of other processes of service and combat activities, on which the overall success of military operations and security depends.

Therefore, decision support systems that ensure the performance of service and combat tasks by security forces need to be improved and developed.

Analysis of recent research and publications. The problems of information and analytical support of the control bodies of the security forces of Ukraine are considered in the works [1–5]. A significant contribution to the study of problematic issues of the impact of information and analytical support of the security and defense forces of Ukraine on state security was made by the following scientists: Yu. H. Danyk, H. A. Drobakha, M. O. Yermoshyn, O. Yu. Iokhov, S. A. Mykus, Ye. B. Smirnov, V. H. Solonnikov, K. O. Sporyshev, I. O. Kyrychenko, V. O. Krainov, V. I. Tkachenko.

The studies [6, 7, 8] provide general information on the processes of modeling control and communication systems.

The purpose of the article of the article is to analyze the existing decision-making support systems of the security forces of Ukraine.

Summary of the main material. Simulation models and simulations of military or combat operations are used to analyze and simulate various aspects of military operations. These tools allow conducting virtual trainings, studying strategies, evaluating and analyzing options, as well as improving tactical and strategic decisions. Here are some typical simulation models and simulations in this context [3, 4].

JTLS (Joint Theater Level Simulation) is an example of a large-scale simulation system for analysis and training at the theater level.

VBS3 (Virtual Battlespace 3) is a simulator designed to simulate various aspects of combat operations and military operations. It is used for training, analysis and study of tactical decisions.

CMANO (Command: Modern Air/Naval Operations) is a simulation game aimed at simulating modern air and naval operations. It allows you to analyze tactical scenarios and strategies.

SIMDIS (Simulation Display System) is used to visualize simulation data, as well as to analyze the movement of military units, simulate atmospheric and obstacle conditions, etc.

ACE (Advanced Computerized Environment) is a platform for creating simulation models and simulating military operations. Provides opportunities for training and exploration.

DI-Guy is used to simulate the appearance and movement of military personnel in various scenarios.

These tools help military specialists analyze various scenarios, improve strategies, train military personnel, and study the impact of various factors on the results of military operations. In addition, they can be used to study new technologies and tactics in the military sphere.

Strategic and tactical military decision-making requires careful planning, analysis, and effective resource management. There are different approaches to this process, which may vary depending on the specific situation, methodology, and scope of military operations. Here are some general approaches to strategic and tactical military decision-making [1, 2, 3].

Strategic decision-making:

– the use of a systematic approach to consider the whole picture of military operations, taking into account various interrelations and the influence of various factors;

– assessment of the internal strengths and weaknesses of one's own troops and enemy troops in order to develop strategies that maximize the advantages and compensate for the shortcomings;

– taking into account such geopolitical factors as geographical location, resources and geostrategic importance of regions;

– assessment of potential threats and opportunities arising from the external environment for the formulation of security and defense strategies.

Tactical decision-making [1–4]:

– use of SWOT analysis (Strengths, Weaknesses, Opportunities, Threats) to identify strategic advantages, weaknesses and opportunities, as well as to identify potential threats;

– development of various courses of action, taking into account various possible options for the development of events and determining the most optimal;

– the ability to quickly adapt to changes in the military environment and respond to unforeseen circumstances;

– leadership and teamwork for effective coordination of actions on the battlefield;

– the use of modern technologies to increase efficiency and ensure an advantage in the confrontation.

Military decision-making requires a multifactorial approach and a deep understanding of one's own capabilities, strategic goals, and tactical circumstances. Each stage of military operations requires careful analysis and the development of effective strategies to achieve the goals.

MDMP (Military Decision-Making Process) is a standard approach to strategic and tactical military decision-making, which is used in the armies of many countries. The main goal of MDMP is to systematize and standardize the military planning and decision-making process. It takes into account numerous aspects to ensure the effectiveness and success of military operations.

The main steps of MDMP are as follows [4].

Mission Analysis is the first stage at which the commander analyzes the task (mission), collects information about the situation and assesses the initial conditions.

Course of Action Development. At this stage, possible courses of action are generated to complete the mission. Each course is carefully designed and evaluated taking into account various factors: enemy forces, terrain, time and resources.

Course of Action Analysis. The commander and his staff evaluate each course of action, comparing them according to various criteria: effectiveness, risks, cost.

Course of Action Selection. The commander chooses the most optimal course of action, taking into account the results of the assessment and the analysis carried out at the previous stages.

Orders Production. At this stage, an order is generated, which includes all the necessary details for the implementation of the chosen course of action, in particular, tasks for departments, determination of resources and communications.

Execution. The execution of the order begins, and the commander monitors the development of the situation, makes the necessary changes to the execution of tasks.

MDMP is defined by structure, discipline, and decision-making orientation in a military context. Its main goal is to provide headquarters and commanders with effective tools for planning and managing military operations.

JTLS (Joint Theater Level Simulation) is a large-scale military computer simulation system used for training and training in joint operations at the theater level. This system is designed to simulate and analyze military operations in real time over large areas, taking into account various aspects: logistics, communications, fire support, intelligence, engineering, etc. [5].

The main features and functions of JTLS include the following:

– modeling of various aspects of combat operations, taking into account various components of the modern combat environment, in particular land, air and sea forces;

– modeling of such logistical aspects as supply, transport, maintenance, ammunition, etc.;

– taking into account the capabilities of fire support, artillery, aviation and other fire systems;

– real-time modeling of communication systems and command and control structure;

– taking into account the actions of intelligence means and collecting information;

– providing military personnel with the opportunity to use the system to train and prepare for real situations;

– the ability to model different types of conflicts, including symmetric and asymmetric threats.

JTLS enables military teams and analysts to perform real-time analysis and planning, improving their decisions and strategies in a virtual military environment.

The development of military affairs is mainly based on the analysis of the experience of past wars and armed conflicts, but in modern conditions, computational experiments using various kinds and scales of mathematical models and modeling complexes are becoming more and more widespread, with the help of which it is possible to predict the nature, forms and types of armed conflicts, to test new weapons, new technologies for organizing and conducting military operations.

Today, there are various tendencies in the application of the mathematical description of the armed confrontation, in particular, a mathematical description based on the comparison of combat potentials, logical-analytical methods characterized by the representation of real processes and systems in the form of obvious functional dependencies (scenarios, stages of decisive rules), simulation, which describes the apparatus of making more frequent decisions with an element of probability (target hit/not hit, detected/not detected, etc.) [6, 7, 8]. For processes and systems with a complex nature of behavior (such are the processes of armed struggle), when mathematical formalization is impossible, which provides an analytical solution to the problem, the only approach to the study is the use of simulation modeling methods [1, 4].

When designing models of armed confrontation, preparing system-technical and software solutions, first of all, the target modeling guideline, its functional purpose and the place of the model in the decision-making system are taken into account. At the same time, it should be understood that the model is only a tool for the activities of staff officials and commanders and cannot ensure the development of a single correct and comprehensively justified decision in accordance with the conditions of a particular situation. The model is an auxiliary tool for supporting the decision-making process and evaluating possible alternatives. This is due to the fact that its mathematical apparatus and algorithms cover a variety of complex processes, factors and conditions that directly affect the results of modeling. Some of them are quantitative, for example, the combat and numerical composition of the conflicting groups,types and characteristics of weapons and military equipment, allocated resources, physical, geographical and meteorological conditions, etc. [6, 7, 8].

The rest of the initial data, for objective reasons, cannot be represented in quantitative terms, since they belong to the cognitive sphere of the human being. That is why today in the process of modeling hostilities, only formal data are taken into account.

Taking into account the bilateral nature of the armed confrontation is the most important methodological feature of modeling. In this case, we are talking about complex processes of confrontation between two antagonistic systems, which enter into each other not only into a combat, but also into an intellectual conflict, which is assumed by the plans of the actions of the parties. Therefore, at present, the armed confrontation (operation, battle) is considered not only as an armed confrontation of two antagonistic systems, but also as systems that simultaneously realize all their informational, moral-combat, psychological and moral-technical potential, which is taken into account in the decisions of the conflicting parties. Thus, we have an intellectual confrontation between two opponents who implement their decisions through the prism of the actions of subordinate troops [1].

Conclusions

Information and analytical support of the security forces of Ukraine has specific decision-support systems, simulation models of service and combat operations, databases, as well as systems for recognizing wanted objects. The general information technologies of the security forces as a subject of state security are automated management systems and document management systems.

Support systems have a wide range of tools, techniques and technologies aimed at ensuring effective management of the country's security. Improving and developing decision-support systems in this area is a continuous process that requires a combination of strategic vision, technical knowledge and flexibility in response to new challenges and threats.

Information and analytical support of the management of security forces during managerial decision-making should be based on such key principles as polycentricity, hierarchy (organization of the process of determining management goals on a hierarchical basis), entropy, optimality, adequacy of results to the set goal, as well as multivariance. These principles are interdependent and generally form the basis for an effective management process, especially in situations that require a high level of responsibility and strategic thinking, in particular ensuring national security.

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АНАЛІЗ СИСТЕМ ПІДТРИМКИ ПРИЙНЯТТЯ РІШЕНЬ У ХОДІ ВИКОНАННЯ СЛУЖБОВО-БОЙОВИХ ЗАВДАНЬ СИЛАМИ БЕЗПЕКИ УКРАЇНИ

Проведено аналіз існуючих систем підтримки прийняття рішень силами безпеки України. Визначено, що прийняття військових рішень вимагає багатофакторного підходу та глибокого розуміння власних можливостей, стратегічних цілей і тактичних обставин. Кожний етап військових операцій потребує ретельного аналізу і розроблення ефективних стратегій для досягнення поставлених цілей.

Задля досягнення й утримання інформаційної переваги необхідно запроваджувати заходи, спрямовані на підрив систем управління, процесів прийняття рішень, а також на руйнування комп'ютерних та інформаційних мереж і систем противника. Новітні інформаційні технології перетворюються на елемент сучасного збройного протистояння. Їх упровадження значно розширює коло можливих сценаріїв розв'язання і ведення збройних конфліктів, зокрема з використанням детального планування і прогнозування їх наслідків у всіх сферах – політичній, економічній, військовій та інших.

Системи підтримки мають широкий спектр інструментів, методик і технологій, спрямованих на забезпечення ефективного управління безпекою країни. Удосконалення й розвиток систем підтримки прийняття рішень у цій сфері становить безперервний процес, який вимагає поєднання стратегічного бачення, технічних знань і гнучкості у відповідь на нові виклики й загрози.

Інформаційно-аналітичне забезпечення управління силами безпеки під час прийняття управлінських рішень має ґрунтуватися на таких ключових принципах, як поліцентричність, ієрархічність (організація процесу визначення цілей управління на ієрархічних засадах), ентропійність, оптимальність, адекватність результатів поставленій меті, а також багатоваріантність. Зазначені принципи взаємозалежні і разом формують підґрунтя для ефективного управлінського процесу, особливо в ситуаціях, що потребують високого рівня відповідальності та стратегічного мислення, зокрема забезпечення національної безпеки.

Ключові слова: *державна безпека, концептуальні засади державного управління, сили безпеки, інформаційно-аналітичне забезпечення, органи управління, системи підтримки прийняття рішень.*

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