



T.A. Samaev, E.L. Isabekov

National Defense University of the Republic of Kazakhstan, Astana, Kazakhstan

E-mail: dosent.Samaev@mail.ru

ON SOME ASPECTS OF THE CONTROL SYSTEM OF THE ARMED FORCES OF LEADING FOREIGN COUNTRIES IN THE INFORMATION AGE

The article is devoted to the study of key aspects of the control system of the Armed Forces of leading foreign countries in the information age. Modern approaches to control are considered, including the use of digital technologies, artificial intelligence, network structures and automated troop control systems. Particular attention is paid to a comparative analysis of the control strategies of the armed forces of the United States of America and the North Atlantic Treaty Organization (NATO). The study emphasizes the role of information technology in increasing operational flexibility, speed of decision-making and interaction between different levels of military control. The findings of the study emphasize the need to adapt domestic control systems to new challenges and threats arising in the information age. A thorough exploration of structural principles, operational procedures, and doctrinal frameworks that define the command-and-control architectures of the armed forces of technologically advanced states will enhance and deepen the methodological, theoretical, and practical dimensions of military science in the Armed Forces of the Republic of Kazakhstan.

Keywords: Armed Forces, information age, control system, digital technologies, artificial intelligence, control strategy.

Introduction.

With the development of information technologies, the modernization of control systems in the army is gaining momentum, which is due to the needs of the information era. Advanced approaches are being introduced to improve the efficiency of command and control of troops, optimize management processes, and successfully integrate disparate weapons and systems.. Major foreign countries, such as the United States of America (hereinafter referred to as the USA) NATO member nations are engaged in the consistent implementation of progressive technological capabilities aimed at transforming and strengthening their military command-and-control mechanisms, enabling these systems to adapt to evolving operational realities, including cyber-based threats and the diverse spectrum of asymmetric conflict. The relevance of the analysis lies in studying the experience of these countries and developing proposals for modernizing domestic control systems.



Materials and Methods.

The research employed the following methodological approaches:

- comparative analysis - comparison of approaches to the organization of control used in different countries;
- systems approach - analysis of the impact of digital technologies, automation and artificial intelligence on troop control;

Main part.

The uncertainty and unpredictability of its development have become integral characteristics of the modern stage of our civilization. The situation is further aggravated by the fact that there is a tendency for it to become more complex. As a result, local events can now cause global consequences, as evidenced by the current economic crisis, which initially arose due to financial problems in the credit and mortgage system of the United States of America (hereinafter referred to as the USA), and then rapidly spread throughout the world.

These changes are of a fundamental nature, comparable, for example, to the the formation and dissemination of novel military capabilities that fundamentally altered the nature of armed conflict, as well as the progressive incorporation of research-driven informatization tools into economic activity, which led to the transition from a post-industrial society to an information society or, according to the capacious definition first given by the famous specialist in the field of management theory and sociology Peter Drucker [1], to the information age or the era of the knowledge economy.

First of all, it should be noted that the "information age" is a very conditional concept that does not have a formal definition and recognized terms. A change of eras occurs when factors or conditions arise that lead to fundamental changes in various aspects of the life and work of a civilization.

The emergence of the "information age" is primarily associated with revolutionary changes in the field of information (the emergence of the knowledge economy) [2, p. 62], which had a significant impact on the search for and development of new forms and methods of doing business and managing the economy

Most likely, the main reason for the informatization of management processes was the technological advances in microelectronics and microprocessor technology, which led to a decrease in the cost of storing, processing and transmitting information and, as a result, became a catalyst for the rapid development of the software and information technology market.

At the same time, the US Armed Forces, which are today the most technically equipped, have a significant impact on the formation of modern doctrines, strategies and concepts for the construction of the armed forces of foreign states, and especially those included in the North Atlantic Treaty Organization (hereinafter referred to as NATO). To substantiate this point of view, it is necessary to note first of all that the emergence of the concept of "Combat Management Based on a Single Information and Communication Space" (hereinafter referred to as CMBS based on the SIS) was a consequence of the



information technology breakthrough, and one of the areas of military affairs that is most affected by it is the management of troops and weapons. The outlined aspects are manifested through a combination of prerequisites and influencing factors, which are structured and presented in Table 1.

Table 1 - The sphere of control of armed struggle in modern conditions

№ п/п	Sphere management of armed struggle	Prerequisites and factors
1.	Option 1	The security environment in which states existed in the industrial era has undergone qualitative changes.
2.	Option 2	The blurring of traditional boundaries between strategic, operational and tactical management levels is due to the widespread introduction of information technology into management processes.
3.	Option 3	The security revolution is seen as a reduction in the possibilities for carrying out mass killings and causing mass casualties, that is, the physical destruction of the enemy and the depletion of this potential, which is no longer the main goal of armed struggle.

Results and Discussion.

Let us consider the essence of the main aspects of the concept of "Combat control based on a single information and communication space" and the key word in its name - "control"[3]. Currently, the military-scientific community of the United States and NATO is actively discussing the nature and content of these categories with the aim of developing new approaches to improving troop control systems. In the joint charter of the US Armed Forces JP1-02 "Dictionary of Military and Specialized Terms" [4] the term "command" is interpreted as "... the exercise of authority and control over assigned troops (forces) by the commander appointed in accordance with the requirements of the regulatory documents to perform the assigned tasks" [5]. "Operational control" is carried out by the commander through the coordinated use of personnel, weapons and military equipment, communications equipment, infrastructure elements and procedures in the process of planning and organizing combat operations, interaction, coordination and control of military operations in order to achieve the assigned tasks.

Command is the authority granted to military personnel (the commander and his staff) to administer, manage, and control the movements and tasks performed by military contingents (forces).

Operational control constitutes a delegated, though limited, authority assigned to a commander or a designated member of the staff, enabling them to supervise and regulate the operational activities of subordinate units, as well as certain other organizational entities outside their direct command hierarchy. This authority involves ensuring compliance with issued directives and orders, while actively managing processes to achieve the strategic and tactical objectives set forth.

Command and operational control represent the scope of power and the set of functions exercised by a commander (including the staff) to direct, coordinate, and oversee the execution of assigned missions within a specific military unit or formation. Thus, despite the rather broad interpretation of the term "Command and Control" in the regulatory documents of the US Armed Forces and the Joint Forces of NATO, as well as in various studies and developments, in practice "command" represents the legally established authority and responsibility for developing the "commander's plan", while "operational control" includes the processes and functions that ensure its implementation (Figure

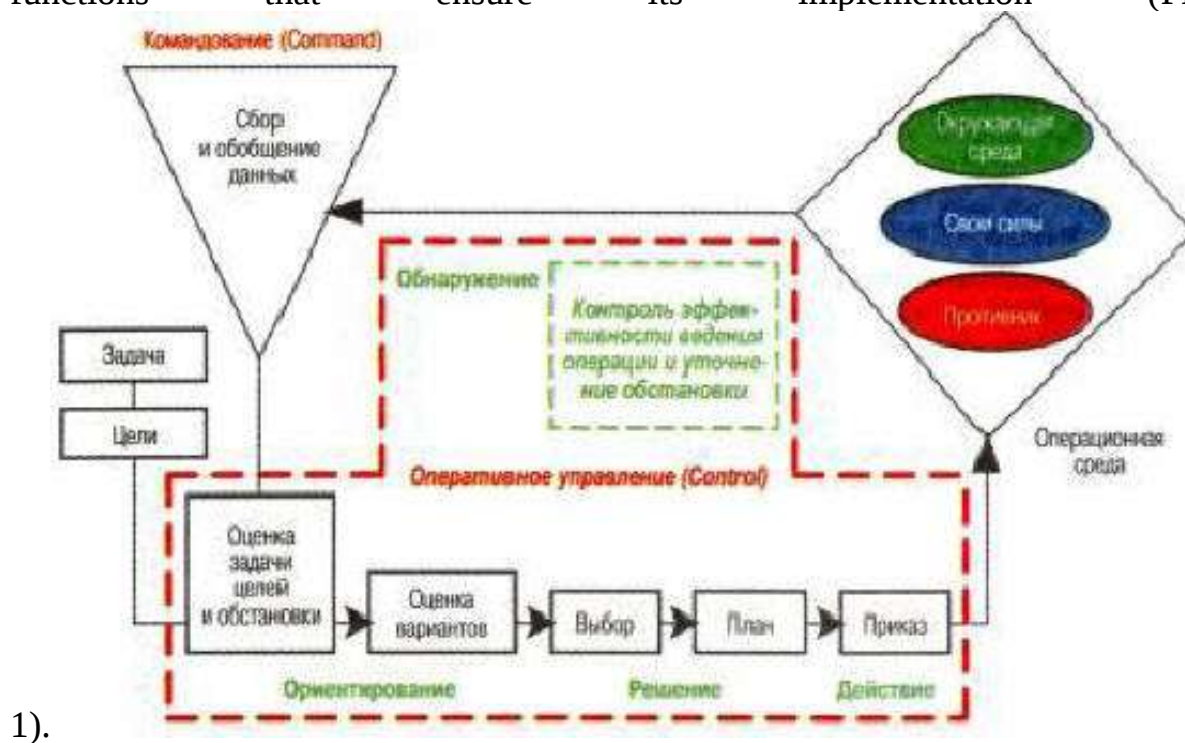


Figure 1 - Integrated Command and Control Process

The armed forces, like other fairly complex organizations, are built on a hierarchical principle. The term "hierarchical organization" is used to describe many structures with a tree-like topology. This form of organization is neither "good" nor "bad" in itself; it may be appropriate or inappropriate depending on the task at hand. A characteristic feature of military hierarchy is its adaptation to meet the strict requirements for quality and continuity of communication in a combat situation. In such hierarchies, the transfer of information between levels of command must occur vertically [6].



In the most developed armed forces of the 20th century, six different models of command and control were distinguished, which differ in the level of centralization: cyclical, command-directive, problem-solving, problem-limiting, selective control and autonomous. Their ordering in descending order of this indicator reflects the degree of central control based on orders emanating from the command structures of the operational level of control [7].

One of the key features of the military art of the industrial era is the absence of a single "best" model of command and operational control. An in-depth analysis of the circumstances and influencing factors of that period enables us to conclude that the selection of a command and control system is contingent upon multiple aspects, such as [8]:

- the operational environment and conditions under which military actions are conducted;
- the reliability and continuity of communication links among combat units;
- the quantity and accuracy of information exchanged between combat units and the functional elements of command structures;
- the level of professional expertise of the commanding personnel, alongside the combat readiness and coordination among forces;
- the extent of creativity and initiative demonstrated by decision-makers within the troops, including commanders of subordinate formations.

The results of the study show that strategic leadership of the armed forces of foreign countries has significant potential for improving and developing strategic management. In this regard, several conclusions are offered.

Thirdly, the United States is actively developing artificial intelligence and automated systems, focusing on the speed of decision-making.

Fourthly, NATO is introducing unified platforms that increase the compatibility of the armed forces of the participating countries.

Fifthly, the main challenges for all countries remain ensuring cybersecurity, data protection and preventing vulnerabilities in digital systems [9].

Conclusion.

Thus, the information age has radically changed approaches to the management of the armed forces. It is important for the Armed Forces of the Republic of Kazakhstan to take into account international experience, adapting it to their realities and strategic objectives. Improving domestic management systems should include the introduction of modern technologies, the development of a national cybersecurity infrastructure and the training of personnel capable of working effectively in the context of digital transformation.

The introduction of more effective strategic management mechanisms in the Armed Forces of the Republic of Kazakhstan will increase their operational readiness and combat effectiveness. A successful solution to existing problems is possible provided that an integrated approach combines modern technologies, qualified personnel and international cooperation.



REFERENCES

1. Peter F. Drucker, Post Capitalist Society. Harper Business, 1994.
2. Сетецентрическая война (Net-Centric Environment Joint Functional Concept) // DOD, 2005. - Appendix B. Glossary.
3. О становлении и развитии концепции «Объединенности» см.: д.в.н. Печуров С. Л. «Англо-саксонская модель управления в военной сфере». - М.: Ком. Книга, 2005. - 232 с.
4. Основные оперативно-стратегические понятия, определения и термины, применяемые в уставных документах Вооруженных сил Российской Федерации. - Москва, Генеральный штаб ВС РФ, 2002. - 46 с.
5. JP 1-02. «The Department of Defense Dictionary of Military and Associated Terms», US Joint Chiefs of Staff. 2006.
6. North Atlantic Treaty Organization (NATO). «Glossary of Terms and Definitions». Standardization Agreement No. AAP-6 (R). NATO HQ, Brussels: 1988.
7. Curts, Raymond J., Charles Ristorcelli. Information Warfare Implementation Plan and Acquisition Strategy. Washington, DC: Space & Naval Warfare Systems Command (SPAWAR), 1996.
8. Pigeau, Ross and Carol McCann. «Re-Conceptualizing Command and Control". Canadian Military Journal, 3.1: 53-64, 2002.
9. Creveld, Martin van. Command in War. Cambridge, MA: Harvard University Press. 1985.

Таттибек Самаев, докторант, доцент, полковник, ҚР Ұлттық қорғаныс университеті, Астана, Қазақстан, auken.dianaa@gmail.com

Ерлан Исабеков, магистрант, полковник, ҚР Ұлттық қорғаныс университеті, Астана, Қазақстан, auken.dianaa@gmail.com

АҚПАРАТ ДӘУІРІНДЕГІ ЖЕТЕКШІ ШЕТЕЛ ЕЛДЕРДІҢ ҚАРУЛЫ КҮШТЕРІН БАСҚАРУ ЖҮЙЕСІНІҢ КЕЙБІР АСПЕКТІЛЕРІ ТУРАЛЫ

Аңдатпа. Мақала ақпарат ғасыры жағдайында жетекші шет мемлекеттердің Қарулы Күштерін басқару жүйесінің негізгі аспектілерін зерттеуге арналған. Сандық технологияларды, жасанды интеллектті, желілік құрылымдарды және әскерлерді басқарудың автоматтандырылған жүйелерін пайдалануды қоса алғанда, бақылаудың заманауи тәсілдері қарастырылады. Америка Құрама Штаттары мен Солтүстік Атлантикалық Шарт Ұйымы (НАТО) елдерінің қарулы күштерін басқару стратегияларының салыстырмалы талдауына ерекше назар аударылады. Зерттеу операциялық икемділікті, шешім қабылдау жылдамдығын және әскери басқарудың әртүрлі деңгейлері арасындағы өзара әрекеттесуді арттырудағы ақпараттық технологиялардың рөлін көрсетеді. Зерттеу нәтижелері отандық басқару



жүйелерін ақпараттық дәуірде туындайтын жаңа сын-қатерлер мен қауіп-қатерлерге бейімдеу қажеттілігіне бағытталған.

Жетекші шет мемлекеттердің Қарулы Күштерін басқару жүйесінің мәселелерін зерделеу және талдау Қазақстан Республикасы Қарулы Күштерінің әскери ғылымын айтарлықтай байытады.

Түйінді сөздер: Қарулы күштер, ақпарат ғасыры, басқару жүйесі, цифрлық технологиялар, жасанды интеллект, басқару стратегиясы.

Таттибек Самаев, докторант, доцент, полковник, Национальный университет обороны РК Астана, Казахстан, auken.dianaa@gmail.com

Ерлан Исабеков, магистрант, полковник, Национальный университет обороны РК, Астана, Казахстан, auken.dianaa@gmail.com

О НЕКОТОРЫХ АСПЕКТАХ СИСТЕМЫ УПРАВЛЕНИЯ ВООРУЖЕННЫМИ СИЛАМИ ВЕДУЩИХ ЗАРУБЕЖНЫХ СТРАН В ИНФОРМАЦИОННУЮ ЭПОХУ

Аннотация. Статья посвящена исследованию ключевых аспектов системы управления вооруженными силами ведущих зарубежных стран в информационную эпоху. Рассмотрены современные подходы к управлению, в том числе с использованием цифровых технологий, искусственного интеллекта, сетевых структур и автоматизированных систем управления войсками. Особое внимание уделено сравнительному анализу стратегий управления вооруженными силами Соединенных Штатов Америки и стран Организации Североатлантического договора (НАТО). В исследовании подчеркивается роль информационных технологий в повышении оперативной гибкости, скорости принятия решений и оперативной совместимости между различными уровнями военного управления. Результаты исследования подчеркивают необходимость адаптации отечественных систем управления к новым вызовам и угрозам, возникающим в информационную эпоху.

Изучение и анализ вопросов системы управления вооруженными силами ведущих зарубежных стран существенно обогатят военную науку Вооруженных Сил Республики Казахстан.

Ключевые слова: Вооруженные силы, информационная эпоха, система управления, цифровые технологии, искусственный интеллект, стратегия управления.

Received: November 16, 2025

Peer-reviewed: November 28, 2025

Accepted: December 15, 2025