Information systems research

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ANALYSIS OF THE PECULIARITIES OF THE COMMUNICATION ORGANIZATION IN NATO COUNTRIES

Abstract. According to the Military doctrine of Ukraine, one of the central tasks is to reform the Armed Forces of Ukraine in order to achieve interoperability and technical compatibility with the armed forces of NATO member states, as well as adherence to the standards of work, division of functions and core tasks adopted in the EU and NATO member states. Today, there is a need to improve the system of communication between governing bodies in the military management system. However, the slow pace of implementation of NATO standards is significantly hampering this process. One reason for this is the lack of attention to the adaptation of the Ukrainian Armed Forces' operational planning system to similar systems used in NATO countries. The article analyzes the principal principles of the communications organization and discusses the key steps involved in developing an operational plan based on the capabilities of NATO member countries. Since communication planning is one of the major elements of NATO operations planning, the authors of that article analyzed the operational planning of the communications and information system planning, taking into account the need to align Ukraine's Armed Forces management systems with NATO standards. During the research, the authors examined the main steps involved in planning the communications system, identified the factors that influence its planning process. Therefore, a promising direction for further research by the authors should be considered the justification of ways to improve the planning process of the Armed Forces communications system and detailed research of NATO documentation and standards, in terms of organization and planning of communications, in order to explain the requirements for the military management system in Ukraine. This will allow the harmonization (integration) of Ukraine's national development plans with the NATO defense plan.

Keywords: standards; capability; NATO; Armed Forces of Ukraine; duration system; operational planning; process.

Introduction

A successful development of information technologies (IT) has become a generator of positive examples of their active implementation in various spheres of human life, including in the combat use of troops (forces) and weapons for success achievement during the hostilities.

In this regard, NATO leadership is stepping up activities aimed at enhancing the use of NATO the combined armed forces (CAF) by integrating advanced information technology into decision-making processes, operational planning, and troop and weapon management. in operations of different nature and scale. The main approaches to harnessing new technological advances in the interests of NATO's CAF are set out in the concept of single information space (SIS) of the NATO network-enabled capability (NEC), which is based on a similarly validated NCW (Network-Centric Warfare) concept. during the fighting of the US Armed Forces in Afghanistan and Iraq.

The SIS NATO concept envisages the creation of a global information environment that provides comprehensive real-time processing of enemy information, troops and the surrounding area in order to support decision-making on the creation of troops of the optimal composition and their effective use in different conditions.
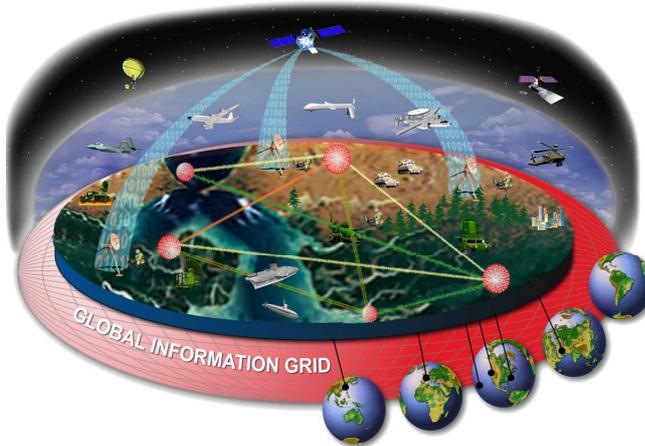
The availability of such an information environment should ensure the effective interaction of all governing bodies and forces of the alliance. According to the military experts of the NATO bloc, the successful implementation of the SIS concept will radically change the procedure for providing military management with information about the enemy, their troops and the surrounding area. The implementation of NATO's SIS concept should not only address these shortcomings but also radically change the approach to operational planning and command of the alliance's weapons during day-to-day operations and crisis management during large-scale military operations. Intelligence information from the various extraction systems, after processing and approval by the respective supervisor, will be continuously transmitted to the SIS databases, from which all interested officials may receive (upon request or in automatic proofing mode), in the presence of special network devices for connection to the SIS. availability of appropriate access to this information.

In this case, intelligence can be provided in standard formats adapted for immediate use in headquarters.

In recent years in Ukraine, special attention has been given to this issue, so, according to the strategic defense bulletin, it has been defined: „… Operational objective 1.4. Creation of an effective system of operational (combat) command, communication, intelligence and surveillance (C4ISR)", the end result of which is: „... creation of a national telecommunication network, modernization and transfer to modern digital

technologies of the special communication system, departmental information and communication networks and communication systems of public authorities, as well as the creation of an automated C4ISR system of constituent defense forces that meets NATO standards, doctrines and recommendations, ensuring its integration in the system of management of defense resources ... " [1] (Fig. 1).

C4ISR Market Application (Command & Control, Communications, Computers, ISR, EW) Forecast to 2021

Fig. 1. General structure of the C4ISR automated system

NATO standards can be roughly divided into administrative, operational and logistical:

– administrative standards define the processes of management and exchange of information, the procedure for working with documentation;

– operational standards are aimed at the operational planning of the use of troops;

– material and technical standards define uniform requirements for the allies' weapons and military equipment, life cycle management, and codification of security items.

It should be noted that each NATO member state has its own national standardization system, that is, each country has its own national standards, and they are all different.

For example, the United States, the United Kingdom of Great Britain, other countries plan military operations according to their operational standards. But while acting within the NATO contingent, they are guided by common standards. That is why the issues of interoperability are very important [1].

The operational planning process is a logical sequence of cognitive processes and other activities undertaken by the commander and the officers of the staff to analyze the situation, outline the requirements for the task and determine the best way to accomplish the tasks and achieve the desired military result.

Objectives of the operational planning process: standardization of the planning process; improving the commander's ability to manage and direct the plan development process; maximizing the capacity of the logical and creative thinking of the officers of the staff, which facilitates the decision of the commanders in the conditions of uncertainty and when there is insufficient amount of time that information; assisting the commander in coordinating and joining forces and combining forces and commands during operational planning.

While conducting joint operations, the successful integration of communication and information systems (CIS) requires that strict technical and management standards be introduced throughout the network. Integration involves combining different components of the system so that the combination of individual systems, capabilities, and functions can effectively collaborate without affecting other elements.

The purpose of joint management of the CIS is ensuring the centralized control and decentralized use of the CIS resources in accordance with the joint force commander (JFC) operational requirements and the revision of priorities. Communication and information systems can provide support and technical solutions for implementing information management in your organization.

Communication plans issued during the development of a particular transaction must be distributed well in advance of the operation to ensure that all communications networks and/or circuits are operational before the operation begins. In addition, it will provide the commanders with the channels necessary to issue advance instructions to units under their control.

Therefore, ***the purpose of the article*** is to analyze the peculiarities of the organization of operational planning of the communication system and information systems on the basis of capabilities in NATO member states, to find out the problematic aspects of the existing system of operational planning of the CIS of the Armed Forces of Ukraine and to determine the main directions of its improvement based on the experience of the states (members of the alliance).

Presentation of the main material

Operational Planning Process is a logical sequence of processes and procedures for analyzing the situation, identifying the requirements for the operation (mission) and possible options for action. In addition, during the OPP determine the composition of forces and devices required for the operation.

According to the procedures, the OPP is practically always in parallel at all NATO leadership levels with very wide use of liaison officers [2].

Unlike the Armed Forces of Ukraine, where the main planning unit is operational management, temporary planning units are established in NATO structures:

at the strategic level it is *Strategic Operational Planning Group* (SPOG);

at the operational level it is *Joint Operational Planning Group* (JPOG);

at the tactical level, depending on the *Component Commands*, for the Airborne Component Command, it is the *Air Operational Planning Group*.

The *Joint Operational Planning Group* (JPOG) is the main unit in the NATO operational headquarters responsible for the OPP.

The responsibilities of the JOPG are:

– operational planning conduction;

– advising the commander on medium- and long-term military operations, including the Courses of Action (COA);

– identifying the needs in strengths and resources required for COA provision, which are preferred by the commanding officer (compiling a multinational statement of requirements);

– preparation and conducting of briefings of the *Mission Analysis Briefing* (MAB), *Decision Briefing* (DB) commander;

– preparation of *Commander's Planning Guidance* (CPG) documents, *Concept of Operations* (CONOPS) and *OPLAN*s (Operations Plan);

– coordinating OPP with other staffs (senior, subordinate and interacting officers);

– review of *Component Commands* plans to ensure consistency with the intention of the Commander Joint Force Command HQ.

The composition of JOPG is not permanent, it is appointed in view of the peculiarities of the operation. The JOPG head is assigned to the ACOS J-5 (Assistant Chief of Staff J5 crisis and deliberate planning) of the planning division.

Typically, JOPGs include:

– officers from *Planning Team Sections Branch* (PB);

– representatives of other departments and services (as appropriate) as a liaison with their departments and services, as well as communication and interaction officers [2].

Planning for communications and information systems is an integral part of NATO's planning process at three levels: strategic, operational and tactical. The active involvement of non-NATO third-party organizations must be taken into account at all levels of CIS planning.

Communication and information systems allow the commander to plan, execute, and exercise ongoing control of operations and exercises.

At the strategic level, planning is carried out in accordance with the crisis operations management process, as described in the Comprehensive Operations Planning Directive (COPD).

CIS contributes the following supporting elements to the strategic level plan: strategic analysis of the CIS, strategic evaluation of the CIS, strategic CONOPS (Strategic Concept of Operations), management of the CIS, strategic leadership of the planning of the CIS and the plan for the provision of the CIS [3].

Operational planning responsibilities are determined at the strategic level, with planning being done through integrated command, component command, or multinational component command level.

The planning process at the operational level consists of the necessary steps to support the commanding officer and the operational staff in the development of the operation plan of the operational level, including carrying out the process of operational evaluation. These steps also include participating and conducting an operational assessment during the operation to review or adjust the plan as needed.

Planning steps:

Step 1 – Initial stage (operational situation assessment).

Step 2 – Situation assessment and mission analysis (Problem analysis and mission purpose definition).

Step 3 – Development of a course of action.

Step 4 – Analysis of the course of activity.

Step 5 – Check and compartment of the analysis of the activity course.

Step 6 – Commander's decision on action course.

Step 7 – Development of a CONOPS operational level and plan.

Step 8 – Evaluation and revision/adjustment of the plan.

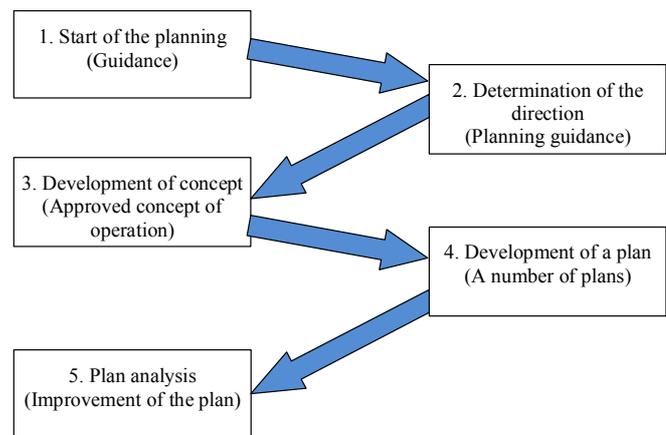Typical operational planning processes are shown in Fig. 2.

Fig. 2. Operational planning processes

The results of the operational planning include the Joint statement of requirements project, the Area of requirements for the operational area project, and the Crisis assessment project [4].

The CIS is facilitated by the following supporting elements of the operational level plan: the operational assessment of the CIS and the cost calculation, information-sharing requirements and the CIS service matrix.

The planning of the CIS is cyclical and multi-stage.

Planning is carried out continuously, in close synchronization with J2 (intelligence agencies), J3 (operational planning) and J5 (defense planning). The principles of the doctrine of the union joint publication AJP-5 stipulate that the planning of a CIS at each stage is ensured through the following processes: setting aims; unity of purpose; support; force concentration; saving effort; flexibility; security; the simplicity of plans and orders; multinationality.

The planning of an CIS is conducted taking into account the following critical planning factors: time; budget; type and scale of operation; availability of resources; limitation of opportunities; functional compatibility; protection of CIS (including cyber defense); deployable communication and information systems (DCIS) that are relevant to current missions and tasks.

The CIS planning also takes into account the following additional planning factors that are used as the basis for the estimation of the CIS:

– required time for planning, pre-deployment, direct deployment (forces and resources), moving and responding to CONPLANs.

– understanding of information exchange requirements (IERs) and information systems and tools;

– the presence of a functioning or commercial CIS and the ability to respond to an urgent operational need;

– the availability of bandwidths and channels, especially for strategic satellite communications and on national communications networks;

– the ability to use and the ability to control a radio frequency resource;

– the readiness of the personnel required for the deployment, operation and maintenance of the CIS, especially for those assets that have recently been purchased;

– operational readiness and compliance with international standardization of technical protocols;

– the architecture of the systems that will be used (eg centralized or distributed, local or remote, as well as fixed or mobile) [2, 5].

The operational plan development is divided into two clearly defined subphases:

– «subphase A» *Operational CONOPS Development* is intended to define the concept of a *Joint Headquarters* of a NATO-led military campaign that will be conducted with other non-military devices and non-NATO countries to achieve the strategic aims and the desired end-point for NATO. CONOPS is developed in accordance with the operational planning directive.

The result of «subphase A» should be the development of a project concept of the operation, usually a volume of 30 ... 40 pages with constituent annexes:

Together with CONOPS JOPG (Joint Operational Planning Group) reports to the management (strategic level) on the following developed documents:

– integrated multinational capability notice;

– requirements of rules of the force use;

– reporting on the required capabilities to the theater of military actions (TMA is an operational area, geographically designated commander to conduct or support specific military operations);

– capabilities are needed from coalition member states on TMA.

To do this, JOPG compares the aims, which should be achieved and the resources, which are planned to be used. This concerns the capabilities of the operation, the ability to achieve the aims, the likely risks, and the feasibility of moving, deploying and sustainable development. It is always important to consider the importance of each of these factors.

– «subphase B» *Operational OPLAN Development* is designed to develop a plan for the specified military campaign.

The result of «subphase B» is the development and design of the operation plan [4].

The operation plan is based on the main unit of

CONOPS, but also includes additions (land, sea, air operations; cyber operations; amphibious operations; communication systems and information systems, etc.).

An operational plan of the operation (OPLAN) is usually the end result of a plan that provides a fairly detailed description of the mission. The forces are assigned, and the necessary preparation is carried out for the successful completion of the mission. The operational plan (OPLAN) can be developed at any command level and formally coordinated and approved by the NATO council.

The operational plan of the operation (OPLAN) consists of a major part and ancillary applications. The CIS information in the operational plan is found in item №5 of the main part of the plan with a description of the detailed architecture in Addition Q "Communication systems and information systems". However, the allied headquarters planning officers in Europe and the joint operations command of the joint gas command (JFC J6) must consider the CIS indicators for each situation, mission, task, and remember that the CIS requirements can be taken into account and in other annexes to the operational plan. Coordination is necessary to ensure that all the requirements of the CIS are met.

Reviewing the plan is the final stage of planning a CIS. This stage usually responds to significant changes in the operational situation and is synchronized with the changes in the lower headquarters (HQ).

The main result of the CIS planning process is the CIS provision plan, which is an integral part of operational planning designed to support risk management planning activities.

The CIS security plan is developed by organizations directly responsible for the provision of CIS, namely the NATO CIS group and the liaison and information agency, in collaboration with operations commanders and subordinate commanders. The plan provides detailed information on how the implementation of the CIS will be implemented at the operational level.

The deputy chief of staff of the allied headquarters in Europe for communications, information systems and cyber defense is responsible (on behalf of the supreme allied commander for Europe) for the overall planning and approval of the CIS plan. In the course of developing an CIS-led plan for the NATO-led operation that provides for the creation of a unified mission network, communication with non-NATO organizations, the NATO communications and information systems group and the communication and information agency represent is a contribution of NATO Command to collective development, reflecting the equal shares of all partners providing network services. The director-general of the communications and information agency is a technical officer and is responsible for creating a technically coherent, stable CIS environment and maintaining an appropriate level of control over the technical aspects of service delivery in the CIS area (including those provided by the NATO CIS group).

All plans have a limited duration due to the possibility of changing the circumstances on which they

are based. The purpose of the plan review phase is to ensure that the plan remains effective and complies with actual requirements, policies and doctrine and is effective in its practical implementation. Changes in the situation or available resources may affect the CIS plan. Therefore, planning officers for the liaison officers of the supreme allied headquarters in Europe should analyze the scope and scale of any changes and make any changes to the CIS.

Each non-NATO unit involved contributes to the operation, making it an important part of the agreed base agreement in the planning of the CIS. Based on the size of the contribution to the mission, the role of the coalition organization and the political arrangements, non-NATO organizations may or may not have the right to request a liaison between the JFC, senior political and military organizations. Non-NATO organizations will provide their input, including the CIS, to the extent specified by the management.

Existing technical and functional compatibility between NATO, NATO countries and non-NATO entities will vary depending on the degree of engagement with NATO and/or NATO countries. Each non-NATO entity that participates in a NATO-led coalition mission will have different capabilities and levels in the CIS area. Organizations may also be allowed to have easy access to the interface, integration with major NATO command and control systems (C2) and CIS involved in NATO headquarters. In some cases, non-NATO organizations may request bilateral support for the CIS and services from NATO, the NATO operation's host country or other mission partner to assist with their mission support tasks [2, 3].

Conclusion

The analysis showed that in order to ensure the effective exercise of the powers of leadership in the command and control system, a high degree of rapid exchange of information, both vertically and horizontally between organizations, is required in accordance with the hierarchy of management structures. In order to achieve effective command and control of troops deployed under NATO (peacetime) operational command, effective and proper information exchange between the liaison forces or the command and control units (headquarters) must be undertaken.

The paper evaluates the basic principles and develops an operational plan based on capabilities in NATO member states. Against this background, the Armed Forces of Ukraine officers should actively master the operational planning process in order to move to NATO standards as soon as possible. As a result, the implementation of NATO standards in the functioning of the Armed Forces of Ukraine is to increase the operational and combat capabilities of the Armed Forces of Ukraine and their interoperability with the armed forces of the leading countries of the world.

The authors` further direction of research should be to justify ways of improving the Armed Forces' communications system planning process and to study NATO documentation and standards in detail with regard to organization and planning of communications in order to clarify the requirements for the Ukrainian military system. This will allow the harmonization (integration) of Ukraine's national development plans with the NATO defense plan.

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Аналіз особливостей організації зв'язку в країнах НАТО

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Анотація. Відповідно до Воєнної доктрини України, одним з центральних завдань вважається реформування Збройних Сил України для досягнення оперативної та технічної сумісності зі збройними силами країн-членів НАТО, а ще дотримання прийнятих в державах-членах ЄС та НАТО стандартів роботи, розподілу функцій і основних завдань. Сьогодні існує потреба у вдосконаленні системи зв'язку між органами управління в системі управління військами. Проте низькі темпи впровадження стандартів НАТО значно стримують цей процес. Однією з причин цього є недостатнє приділення уваги до адаптації системи оперативного планування Збройних Сил України до аналогічних систем, які використовуються в країнах-членах НАТО. У статті проведено аналіз основних принципів організації зв'язку та розглянуто основні етапи з розробки оперативного плану на основі спроможностей країн-членів НАТО. Оскільки, планування зв'язку є однією з основних частин планування операцій в НАТО, автори зазначеної статті провели аналіз оперативного процедур планування системи зв'язку та інформатизації беручи до уваги необхідність наближення систем управління Збройних Сил України до стандартів НАТО. В ході проведеного авторами дослідження розглянуто, основні етапи, які охоплює планування системи зв'язку, визначено чинники, що впливають на процес її планування. Отже, перспективним напрямком подальших наукових досліджень авторів слід вважати обґрунтування шляхів удосконалення процесу планування системи зв'язку Збройних Сил України та детальному вивченню документації та стандартів НАТО, в частині, що стосується організації та планування зв'язку, з метою пояснення вимог до системи управління військами в Україні. Це дасть можливість гармонізації (інтегрування) власних національних планів розвитку Збройних Сил України з планом оборони НАТО.

Ключові слова: стандарти; спроможності; НАТО; Збройні Сили України; система зв'язку; оперативне планування; процес.

Анализ особенностей организации связи в странах НАТО

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Аннотация. Согласно Военной доктрины Украины одной из центральных задач считается реформирование Вооруженных Сил Украины для достижения оперативной и технической совместимости с вооруженными силами стран-членов НАТО, а также соблюдения принятых в государствах-членах ЕС и НАТО стандартов работы, распределения функций и основных задач. Сегодня существует потребность в совершенствовании системы связи между органами управления в системе управления войсками. Однако низкие темпы внедрения стандартов НАТО значительно сдерживают этот процесс. Одной из причин этого является недостаточное внимание к адаптации системы оперативного планирования Вооруженных Сил Украины в аналогичные системы, используемые в странах-членах НАТО. В статье проведен анализ основных принципов организации связи и рассмотрены основные этапы по разработке оперативного плана на основе возможностей стран-членов НАТО. Поскольку, планирование связи является одной из основных частей планирования операций в НАТО, авторы указанной статьи провели анализ оперативных процедур планирования системы связи и информатизации, принимая во внимание необходимость приближения систем управления Вооруженных Сил Украины к стандартам НАТО. В ходе проведенного авторами исследования рассмотрены основные этапы, которые охватывает планирование системы связи, определены факторы, влияющие на процесс ее планирования. Итак, перспективным направлением дальнейших научных исследований авторов следует считать обоснование путей совершенствования процесса планирования системы связи Вооруженных Сил Украины, детальное изучению документации и стандартов НАТО, в части, касающейся организации и планирования связи, с целью объяснения требований к системе управления войсками в Украине. Это даст возможность гармонизации (интегрирования) собственных национальных планов развития Вооруженных Сил Украины плану обороны НАТО.

Ключевые слова: стандарты; способности; НАТО; Вооруженные Силы Украины; система связи; оперативное планирование; процесс.